Report

Data Evaluation Report

Inline Solids in Basins M-1 and 18

Prepared for

City of Portland
Bureau of Environmental Services
Portland Harbor Source Control Pilot Project

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Abbreviations and Acronyms

BES	Bureau of Environmental Services
BEHP	bis(2-ethylhexyl)phthalate
BNSF	Burlington Northern Santa Fe
DDT	dichlorodiphenyltrichloroethane
DEQ	Oregon Department of Environmental Quality
gpm	gallons per minute
HPAH	high molecular weight polynuclear aromatic hydrocarbon
ID	identification
ISA	initial study area
JSCS	Joint Source Control Strategy
LPAH	low molecular weight polynuclear aromatic hydrocarbon
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
SAP	Sampling and Analysis Plan
SVOCs	semivolatile organic compounds
TMP	truck manufacturing plant
TOC	total organic carbon
TPH	total petroleum hydrocarbon

SECTION 1

Introduction

The City of Portland (City) is investigating the nature and extent of contamination from upland areas that may enter the City's stormwater conveyance system and discharge into the Willamette River, resulting in contamination of river sediments. The Oregon Department of Environmental Quality (DEQ), which is responsible for upland investigations relating to the Portland Harbor Superfund site, is overseeing this investigation.

1.1 Background

The City and DEQ are working together to develop an effective streamlined process for investigating and evaluating City stormwater outfalls within the Portland Harbor Initial Study Area (ISA). In August 2002, the City developed the *Source Control Pilot Project for the City of Portland Outfalls Work Plan* (CH2M HILL, 2002) to coordinate the City and DEQ investigation and source control efforts. The Work Plan identified one east side and one west side City outfall drainage basin to implement the Pilot Projects: Basins M-1 and 18. The Work Plan identified two key Phase 1 pilot project activities for the City to conduct: (1) sediment sampling offshore of each outfall, and (2) basin assessments focused on identifying potential sources of contamination to the stormwater conveyance system, including inspections of industrial facilities. Phase 2 of the pilot project included developing and assessing an inline solids investigation program.

Results of the Phase 1 activities have been summarized in the *Phase 1 Data Evaluation Report and Phase 2 Work Planning for Outfall M*-1 (CH2M HILL, January 2003) and *Phase 1 Data Evaluation Report and Phase 2 Work Planning for Outfall 18* (CH2M HILL, April 2004) reports.

This document presents analytical results from the Phase 2 inline solids investigation conducted in August 2003 by the Bureau of Environmental Services (BES) in outfall drainage basins M-1 and 18. Data collected from this pilot project will be used by the City to focus source control efforts within these outfall basins, as well as by the DEQ Cleanup Program to focus upland site pathway evaluations. Initial investigations in these basins also have been used to develop streamlined processes for investigating and evaluating City outfalls as part of the ongoing *Programmatic Source Control Remedial Investigation Work Plan for the City of Portland Outfalls Project* (CH2M HILL, 2004).

1.2 Purpose

The inline solids investigation sampling 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 this investigation was threefold:

- Evaluate the feasibility of collecting inline solids samples from the stormwater conveyance system.
- Assess whether samples are representative of a source of solids entering the stormwater conveyance system from facilities located within the basin.
- Identify subbasins with substantially higher concentrations of chemicals that indicate further investigation is warranted.

The City and DEQ Cleanup Program will use results from this investigation to guide future source control efforts in upland remedial investigations (RIs).

SECTION 2

Inline Solids Investigation Field Observations

This section presents a summary of the August 2003 inline solids investigation field activities and observations within the City's stormwater conveyance system in Basins M-1 and 18. Sampling protocols were followed as described in the *Sampling and Analysis Plan – Inline Solids in Basins M-1 and 18* (SAP) (CH2M HILL, August 2003).

Sample locations were selected to characterize inline solids, which may indicate contaminant releases to the conveyance system upgradient of the sampling point. Each outfall basin was divided into subbasins to facilitate subsequent data evaluation and source control investigation. For both Basin M-1 and Basin 18, Subbasin 1 represents the collective inline contribution of all subbasins upstream of the Subbasin 1 sample. 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) occurred in the conveyance system.

Figure 2-1 shows sampling locations and their associated subbasins for Basin M-1. Six inline solids samples and one duplicate sample were collected from Basin M-1. Figure 2-2 shows an overview of the Basin 18 subbasins and Figure 2-3 shows the developed portion of Basin 18, the sampling locations, and the associated subbasins. Six inline solids samples were collected from Basin 18.

The City collected samples between August 12 and August 20, 2003. Deviations from the SAP are noted in Sections 2.1.3 and 2.2.3. Observations for each sample were recorded by a representative of the City on the field data sheets (Appendix A) and by a representative of CH2M HILL in a field notebook (Appendix B). Site photographs are presented in Appendix C.

Weather during the sampling event was generally sunny, with highs in the low 80s (Fahrenheit) and with no recorded precipitation. Figure D-1 of Appendix D presents the daily rainfall for Portland, Oregon, from August 1–20, 2003.

2.1 Basin M-1 Inline Field Observations

Figure 2-1 of the SAP presented the proposed subbasins to be assessed during the inline solids investigation in Basin M-1, along with proposed manhole locations for collection of representative samples. However, several of the sample locations were moved because sufficient solids were not present at the proposed locations. Figure 2-1 of this report presents the actual sample locations and associated subbasins. Table 2-1 presents the subbasin areas assessed, entrance manhole (nearest manhole where the sample was collected), sample identification (ID) number (if sample collected), solids description, and field observations. These field observations are summarized in the subsections below.

2.1.1 Dry-weather Flow Observations

This subsection presents a summary of dry-weather flow observed during the field investigation. There are no known facilities in Subbasin 1 with nonstormwater-related permits for discharge to the stormwater conveyance system. Dry-weather flow was observed at the sampling point for each subbasin, with the exception of Subbasin 2. Table 2-2 lists locations where flowing or standing water was observed during the field investigation. Features to note from these observations include the following:

- Dry-weather flow was observed entering manhole AAJ933 from the two lines that merge in this manhole. The City line entering from the northeast is shown on Figure 2-1 as draining the northeast section of Subbasin 6. Flow from this line was clear and the pipe was stained an orange-brown color. The second line, entering from the north, is a private lateral and is shown on the *Stormwater Pollution Control Plan, Freightliner Truck Manufacturing Facility Portland, Oregon* (EMCON, 2001). This line drains the southeastern portion of the Freightliner truck manufacturing plant (TMP). This site does not have any permitted nonstormwater discharges to the stormwater conveyance system. Water entering the manhole from this line was slightly cloudy and distinctly different from the other flow entering this manhole.
- Dry-weather flow was observed originating from Subbasin 3, at manhole AAJ831. Manhole AAJ831 is located at the northeast end of N. Fathom Street. Subbasin 3 drains the northwestern portion of the Freightliner TMP; there are no other connections or inlets to this manhole. This site does not have any permitted nonstormwater discharges to the City stormwater conveyance system. Inline water at this location was clear, and no iron oxide staining was observed on the conveyance pipes.
- The lack of dry-weather flow in Subbasin 2 suggests the dry-weather flow within other Basin M-1 subbasins may be the result of other nonpermitted discharges and not solely from groundwater infiltration.

2.1.2 Sample Observations

Six samples and one field duplicate were collected at the manhole farthest downstream within each subbasin. Two distinctly different types of solids were observed in the basin. Sand with little or no silt was observed and sampled at Subbasins 2 and 3. An orange-brown material, suspected to be groundwater precipitate, was observed and sampled at the four other sample locations: Subbasins 1, 4, 5, and 6.

A brief description of each sample is presented below.

Subbasin 1: IL-M1-AAM104-0803-SW

This sample was collected from the downstream (southwest) line exiting manhole AAM104. The sample location is downstream of most of Basin M-1, excluding several properties along the river, among which are Port of Portland Dredge, Fred Devine Diving & Salvage Company, and Foss Environmental. A 0.5-inch-thick layer of orange-brown material was observed in this line and extended about 20 feet downstream of the manhole. No debris, sheen, or odor was noted (see Photographs 1 and 2 in Appendix C).

Subbasin 2: IL-M1-AAM155-0803

This sample was collected from the downstream (northwest) line exiting manhole AAM155. A 3.5-inch-thick layer of well-graded sand with gravel (well rounded) was observed at this manhole and extended in both the upstream and downstream directions. Two inches of standing water was present at the manhole. The upper inch of the sand was dark brown, while the bottom two inches was black. The sample was collected 0 to 1.5 feet downstream of manhole AAM155 in an area with no standing water. A slight petroleum odor and metal debris (nuts and washers) were observed in the vicinity of the sample location during sample collection; however, no debris or odor was observed in the sample. A light sheen was observed on the sample pore water during sample homogenization (see Photographs 7 and 8 in Appendix C).

Subbasin 3: IL-M1-AAJ831-0803 (Field Duplicate IL-M1-XXY101-0803)

These samples were collected at manhole AAJ831. A 6-inch-thick layer of solids was observed at the manhole and extended into the upstream private lateral pipe and down the City storm pipe. The solids consisted of dark gray sand with approximately 1 percent consisting of paint chips. In addition to the paint chips, significant debris was noted in the sand, including small pieces of plastic and metal (washers). During sample collection, a petroleum odor was observed at the manhole and a sheen was observed on the flowing water (see Photographs 11 and 12 in Appendix C).

Subbasin 4: IL-M1-AAM104-0803-NE

This sample was collected from the upstream (northeast) line entering manhole AAM104. A 0.75-inch-thick layer of orange-brown material was observed in this line and extended 6 feet upstream. A faint discontinuous sheen was observed on the sample during homogenization. No debris or odor was noted (see Photographs 3 and 4 in Appendix C).

Subbasin 5: IL-M1-AAJ829-0803

This sample was collected in the downstream (southeast) line exiting manhole AAJ829 at the base of a small lateral that entered the main line 80 feet downstream (southeast) of the manhole. A 4-inch-thick layer of orange-brown material observed on the sides of the main line appeared to be the result of precipitate deposits from groundwater infiltration at the base of the lateral. No odor, sheen, or debris was observed in the sample (see Photographs 9 and 10 in Appendix C).

Subbasin 6: IL-M1-AAJ933-0803

This sample was collected from the downstream (southwest) line exiting manhole AAJ933. A 1-inch-thick layer of orange-brown material was observed in this line and extended about 10 feet downstream of the manhole. No debris, sheen, or odor was noted (see Photographs 5 and 6 in Appendix C).

2.1.3 Deviations from the SAP

Inline solids samples were collected in accordance with the SAP, with one exception. Several sample locations were moved because solids were not present at the manhole location specified in the SAP. Samples were collected at the next upstream location at which solids

were present. Table 2-1 lists the manholes entered as potential sampling locations and the manholes where actual samples were collected.

2.2 Basin 18 Inline Field Observations

Figure 2-2 of the SAP presented the proposed subbasins to be assessed during the inline solids investigation, along with proposed manhole locations for collection of representative samples. Several of the sample locations were moved because (a) the storm sewer line locations did not match the City's storm sewer line maps, or (b) sufficient solids were not present at the proposed sample location. Figure 2-3 presents the actual sample locations and the resulting subbasins. Table 2-3 presents the subbasin areas assessed, entrance manhole, sample ID number (if a sample was collected), solids description, and field observations for each subbasin.

During the field investigation, it was observed that changes had been made to the stormwater conveyance system that were not depicted on the City stormwater conveyance system maps used to determine proposed sampling locations. After the field event, the City stormwater conveyance system maps were updated. As a result, several of the manhole identification numbers in the basin were changed. The new and old manhole identification numbers are shown in Figure 2-3. For clarity, the new manhole identification numbers are referenced in this document. Table 2-4 presents a summary of the old and new manhole identification numbers and the sample IDs for all of the manholes at which samples were collected.

2.2.1 Dry-weather Flow Observations

This section presents a summary of dry-weather flow observed during the field investigation. Table 2-5 lists locations where flowing or standing water was observed during the field investigation. Features to note from these observations include:

- Dry-weather flow was observed from Subbasin 1 in the 72-inch-diameter pipe at manhole AMZ094. The lines at this manhole were stained an orange-brown color. Flow from Subbasin 3 accounted for a large portion of this flow.
- A significant dry-weather flow was observed in Subbasin 3a (see manhole AAT557 in Table 2-5) resulting from the Univar facility (located at 3950 NW Yeon Avenue) discharge of treated groundwater to the stormwater conveyance system under an Individual NPDES permit. Based on subsequent City field investigation, this discharge is estimated at 25 to 40 gallons per minute (gpm) (BES, 2004). Inline water at this location was clear, and minor iron oxide staining was observed on the sewer lines.
- Standing water was observed in manhole AMZ086 (representing Subbasin 4), although it did not appear to be flowing. There are several Forest Park streams that drain into this subbasin.
- Groundwater intrusion was noted downstream of Subbasin 4, suggesting that groundwater may also contribute to dry-weather flow to Outfall 18.

2.2.2 Sample Observations

Six samples were collected at the manholes farthest downstream within each subbasin. Two distinctly different types of solids were observed. Sand with little or no silt was observed and sampled at five locations: Subbasins 1, 2, 3, 3b, and 4. A silt with little or no sand was observed and sampled at one location in Subbasin 3a.

A brief description of each sample is presented below.

Subbasin 1: IL-18-AAT537-0803

This sample was collected downstream of manhole AMZ094 (Gunderson parking lot). Subbasin 1 includes most of Basin 18, excluding the Gunderson facility. A 1-inch-deep, 3-foot-long band of sand was observed at the manhole. The sample was collected at the manhole, downstream of the convergence of two lines that enter the manhole. The solids were gray sand with a fine layer of orange-brown deposition on the surface. A sheen was observed on the sample pore water during homogenization of the sample. No odor or debris was noted in the sample (no photographs were taken at this location).

Subbasin 2: IL-18-AAT453-0803

This sample was collected at manhole AMZ096. A 1-inch-deep band of sand started at the base of the manhole and extended upstream (northwest) about 2 feet. The sample was collected from this deposit. The solids were a gray sand with a minor amount of red and black sand grains. A small amount (< 1 percent) of Styrofoam™ was observed in the sample. No odor or sheen was observed in the sample (see Photographs 15 and 16 in Appendix C).

Subbasin 3: IL-18-AAT465-0803

This sample was collected 50 to 80 feet upstream of manhole AMZ098, from a 0.5-inch-deep band of sand that started 50 feet upstream (southeast) of the manhole and extended 80 feet upstream of the manhole. The solids were black sand with a small amount (< 1 percent) of fine gravel. A minor amount (< 1 percent) of small (1-millimeter-long) metal shavings was observed in the sample. No odor or sheen was noted in the sample (see Photographs 17 through 19 in Appendix C).

Subbasin 3a: IL-18-AAT557-0803

This sample was collected 10 feet upstream of manhole AAT557. The sample was collected from material forming an accreted silt ledge approximately halfway up the walls of the pipe (see Photograph 21 in Appendix C). The solids were light gray silt with stratified layers of orange, black, and gray. No odor or debris was noted in the sample (see Photographs 20 and 21 in Appendix C).

Subbasin 3b: IL-18-AAT558-0803

This sample was collected 20 to 26 feet downstream of manhole AMZ100 , from a 1-inch-deep, 6-inch-long band of sand. The solids were black sand with a small amount (< 1 percent) of organic matter (blades of grass and tree twigs). A minor amount (< 1 percent) of green flakes (unknown origin) was present in the sample. No odor or sheen was noted in the sample (see Photographs 22 and 23 in Appendix C).

Subbasin 4: IL-18-AAT463-0803

This sample was collected approximately 30 to 33 feet downstream of manhole AMZ086. A 1- to 2-inch-deep band of gray sand started 10 feet downstream of the manhole and extended at least 100 feet. A light sheen was observed on the sample pore water during homogenization of the sample. A small amount (< 1 percent) of red paint chips was observed in the sample (see Photographs 13 and 14 in Appendix C).

2.2.3 Deviations from the SAP

Inline solids samples were collected in accordance with the SAP, except that several of the sample locations were moved because (a) the storm sewer line locations did not match the City's storm sewer line maps, or (b) sufficient solids were not present. Table 2-3 lists the manholes entered as potential sampling locations and the manholes where actual samples were collected.

SECTION 3

Data Evaluation

This section provides an evaluation of the inline sampling results in Basins M-1 and 18.

Inline solids samples were analyzed for selected metals, polynuclear aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), total petroleum hydrocarbon (TPH), pesticides, and total organic carbon (TOC). Results were compared with the Joint Source Control Strategy (JSCS) bioaccumulation and toxicity screening standards for catch basin solids identified in *Portland Harbor Joint Source Control Strategy - Interim Final* (DEQ and U.S. EPA, September 2005).

Data results are summarized in Tables 3-1 and 3-2. Corresponding laboratory data sheets and a data validation report are presented in Appendixes E and F, respectively.

3.1 Data Evaluation Process

The inline solids data evaluation process consisted of a three-step approach to determine potential upland source areas within each basin:

- Field observations were evaluated to assess the feasibility of collecting inline solids samples from the stormwater conveyance system (Section 3.2).
- Field observations were evaluated to assess the representativeness of solids entering the stormwater conveyance system from facilities within each of the subbasins (Section 3.3).
- Analytical results were evaluated to identify subbasins with potential upland sources of contaminants entering the stormwater conveyance system (Section 3.4).

Results of each of these steps are presented below.

3.2 Inline Solids Sample Collection Feasibility

Sampling at the targeted locations was not always successful because of the lack of significant solids deposition in or adjacent to the manholes. Stormwater conveyance systems are typically designed to not accumulate solids so that pipe capacity is maintained for conveying stormwater from upland areas and to prevent flooding of those areas. In a number of cases, the only solids of sufficient quantity were much farther up in a subbasin, which precluded characterizing some potential upland site contributions in that targeted subbasin. In Basin M-1, only two of the six samples collected represented stormwater solids, and both were located at or near the terminus of a storm line.

3.3 Sample Representativeness Evaluation

Field observations were evaluated to assess whether samples are representative of a solids source entering the stormwater conveyance system from facilities located within the basin.

Only solids that appeared to be soil-derived were considered to be representative of solids entering the system from the identified subbasin.

Another issue related to representativeness is what time period of accumulation the solids represent. Because storm lines are designed to not accumulate solids in the pipe, one might assume that the samples represent more recent discharges into the system—but this assumption cannot be tested directly. Especially in areas where there are pipe sags or near the terminus of a storm line where there is reduced flow, inline solids may represent a longer accumulation period. Inline solids may also not represent all solids discharged to the system, as fine materials are more likely to be suspended and transported with storm flow.

This section addresses only whether samples are representative of solids entering the storm system, not whether they are representative of current discharges into the system.

3.3.1 Basin M-1 Samples

As presented in Section 2, four of the six samples collected in Basin M-1 (samples from Subbasins 1, 4, 5, and 6) were an orange-brown material that was scraped from the walls of the stormwater pipe. The origin of this material appears to be the result of mineral precipitation from groundwater that entered the storm sewer system. Photograph 10 in Appendix C shows this precipitate accumulating at a pipe juncture where a small lateral enters the main line. Note that this material is not discharging from the small lateral pipe but, rather, from the joint below the small lateral connection.

The orange-brown color is interpreted to be the result of ferric hydroxide. Iron is relatively soluble in groundwater in a neutral to reducing environment with a pH range of between 6 and 8. This environment is common in shallow groundwater in the Portland Harbor area. Where groundwater enters the stormwater line and is exposed to air, the solubility of iron and other metals decreases; as a result, they precipitate out of solution. This is reflected in the chemical signature of these four samples in which several metals concentrations are substantially elevated and are present in similar proportions.

These four samples are not carried forward in the evaluation of analytical results because the precipitate material is not considered representative of solids entering the stormwater conveyance systems from facilities within each of the subbasins. The analysis of the transport of solids and dissolved contaminants from groundwater into the stormwater conveyance system is beyond the scope of this document.

3.3.2 Basin 18 Samples

All of the six samples collected in Basin 18 appear to be representative of solids entering the stormwater conveyance system from within each identified subbasin. However, it should be noted that, as presented in Section 2, one sample, IL-18-AAT557-0803, was composed of substantially different material than the other five samples. This sample was composed primarily of silt and collected from a ledge of solids located on the side of the stormwater conveyance line. The other five samples were composed primarily of sand and collected from the bottom of the stormwater conveyance line. Differences between the two sample types may be a result of different depositional processes or time periods and should be taken into account when comparing the two sample types.

3.4 Potential Upland Source Assessment

The spatial distribution and relative concentration of contaminants in inline solids are assessed below to determine which subbasins may have contaminant sources entering the stormwater conveyance system.

3.4.1 Chemicals Identified in Phase 1 of the Pilot Project

As part of the Phase 1 Pilot Project, chemical data from sediment sampling conducted in the vicinity of each outfall were compared with DEQ Low, DEQ High, and Willamette River Baseline Sediment Screening Values in order to identify chemicals that may be present at concentrations suggesting historical or ongoing releases to the river (CH2M HILL, January 2003 and April 2004). A summary of these results is presented below. Only those chemicals identified for further investigation in the Phase 1 Pilot Project were carried forward in this assessment.

The Phase 1 data evaluation for Outfall M-1 identified the following chemicals for further source investigation in Basin M-1: chromium, zinc, phthalates, PAHs, and PCBs.

The Phase 1 data evaluation for Outfall 18 identified the following chemicals for further source investigation in Basin 18: lead, mercury, phthalates, PAHs, PCBs, and dichlorodiphenyltrichloroethane (DDT) metabolites.

Figures 3-1 through 3-9 show these chemicals plotted to assist in identifying potential trends and outliers.

3.4.2 Basin M-1 Results

A summary of analytical results for inline solids samples collected from Basin M-1 is presented in Table 3-1. As stated above, chromium, zinc, phthalates, PAHs, and PCBs had been identified for further source investigation work in Basin M-1. Only samples considered to be representative of solids entering the stormwater conveyance system from facilities located within the basin were used in this comparison. Because only two representative samples were collected, limited spatial distribution analysis is possible.

Only Subbasin 2 (at manhole AAM155) and Subbasin 3 (at manhole AAJ831) had samples that could be considered representative of stormwater solids. Both of these sample locations were near the upstream end of the City storm line, with drainage from only a few upland properties. Results from this evaluation are presented below by constituent.

Chromium: Chromium was identified for additional source investigation because elevated concentrations of chromium were detected in the vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, January 2003). The concentration of chromium in river sediment samples collected in the immediate vicinity of the outfall ranged from 11.1 to 148 milligrams per kilogram (mg/kg). The JSCS toxicity screening value for chromium is 111 mg/kg.

Chromium was detected in both of the representative inline solids samples collected (Figure 3-1). For the Subbasin 3 sample, chromium was detected at a concentration of 280 mg/kg (field duplicate was 420 mg/kg). For the Subbasin 2 sample, chromium was detected at 74 mg/kg.

Because chromium was identified for additional source investigation in Basin M-1, was detected at a concentration above its JSCS toxicity screening value in Subbasin 3, and was detected at concentrations above those observed in river sediments adjacent to the outfall, further evaluation of chromium sources and pathways from Subbasin 3 to the stormwater system is warranted.

Zinc: Zinc was identified for additional source investigation because elevated concentrations of zinc were detected in the vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, January 2003). The concentration of zinc in river sediment samples collected in the immediate vicinity of the outfall ranged from 57 to 577 mg/kg. The JSCS toxicity screening value for zinc is 459 mg/kg. The JSCS bioaccumulation screening value for zinc is 3 mg/kg.

Zinc was detected in both of the representative inline solids samples collected (Figure 3-4). For the Subbasin 3 sample, zinc was detected at a concentration of 902 mg/kg (field duplicate was 977 mg/kg). For the Subbasin 2 sample, zinc was detected at 309 mg/kg.

Because zinc was identified for additional source investigation, was detected at a concentration above its JSCS toxicity screening value in Subbasin 3, and was detected in Subbasins 2 and 3 at concentrations above those observed in river sediments adjacent to the outfall, further evaluation of zinc sources and pathways from Subbasins 2 and 3 to the stormwater system is warranted.

Phthalates: Phthalates were identified for additional source investigation because elevated concentrations of phthalates were detected in the vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, January 2003). The concentration of bis(2-ethylhexyl)phthalate (BEHP) in river sediment samples collected adjacent to the outfall ranged from less than 68.4 micrograms per kilogram (µg/kg) (nondetect) to 39,200 µg/kg. The JSCS toxicity screening value for BEHP is 800 mg/kg. The concentration of di-n-butyl phthalate in river sediment samples collected adjacent to the outfall ranged from less than 43.3 (nondetect) to an estimated 30,100 µg/kg. The JSCS toxicity screening value for this phthalate is 100 µg/kg.

Phthalates were detected in both of the representative inline solids samples collected (see Figure 3-5 for BEHP).

For the Subbasin 3 sample, BEHP was detected at a concentration of 14,800 µg/kg (field duplicate was 16,500 µg/kg). Di-n-butyl phthalate was not detected in the normal sample (detection limit was 345 µg/kg), but the field duplicate had a concentration of 1,020 µg/kg.

For the Subbasin 2 sample, BEHP was detected at a concentration of 1,340 µg/kg (di-n-butyl phthalate was not detected).

Because phthalates were identified for additional source investigation and were detected at concentrations above their JSCS toxicity screening values in Subbasins 2 and 3, further evaluation of phthalate sources and pathways from Subbasins 2 and 3 to the stormwater system is warranted.

PAHs: PAHs were identified for additional source investigation because elevated concentrations were detected in the vicinity of the outfall, although no distinguishable

concentration gradient was identified (CH2M HILL, January 2003). PAH ranges detected in river sediment adjacent to the outfalls include:

- Total PAHs: 80 to 2,826 µg/kg (no JSCS screening level)
- 2-Methylnaphthalene: < 2.6 (nondetect) to an estimated 15.4 µg/kg (JSCS screening level = 200 µg/kg)
- Phenanthrene: < 24.6 (nondetect) to an estimated 425 µg/kg (JSCS screening level = 1,170 µg/kg)

LPAHs and HPAHs were detected in both of the representative inline solids samples collected (Figures 3-8 and 3-9).

For the Subbasin 3 sample, 2-methylnaphthalene was detected at a concentration of 2,380 µg/kg (field duplicate was 3,800 µg/kg). Phenanthrene was detected at a concentration of 1,290 µg/kg (field duplicate was 2,640 µg/kg). These concentrations are greater than the JSCS screening levels.

For the Subbasin 2 sample, 2-methylnaphthalene and phenanthrene were detected at concentrations less than 78 µg/kg (nondetect) and 94 µg/kg, respectively, which do not exceed the JSCS screening levels.

Because PAHs were identified for additional source investigation, were detected at a concentration above their JSCS toxicity screening values in Subbasin 3, and were detected at concentrations above those observed in river sediments adjacent to the outfall, further evaluation of PAH sources and pathways from Subbasin 3 to the stormwater system is warranted.

PCBs: PCBs were identified for additional source investigation because Aroclors 1248, 1254, and 1260 were detected in the vicinity of the outfall, although no distinguishable concentration gradient from the outfall was identified (CH2M HILL, January 2003). Total PCB and Aroclor ranges detected in river sediment adjacent to the outfalls include:

- Total PCBs: nondetect to 347 µg/kg (JSCS toxicity screening level = 676 µg/kg)
- Aroclor 1248: < 2.33 to 106 µg/kg (JSCS toxicity screening level = 1,500 µg/kg and JSCS bioaccumulation screening level = 4 µg/kg)
- Aroclor 1254: < 2.07 to 99.5 µg/kg (JSCS toxicity screening level = 300 µg/kg and JSCS bioaccumulation screening level = 10 µg/kg)
- Aroclor 1260: < 3.31 to 141 µg/kg (JSCS toxicity screening level = 200 µg/kg)

PCBs were detected in both representative inline solids samples collected (Figure 3-6). Only Aroclors 1254 and 1260 were detected.

For the Subbasin 3 sample, Aroclor 1254 was detected at a concentration of 276 µg/kg (field duplicate was 378 µg/kg). The field duplicate exceeds the JSCS toxicity screening value, and both the normal and duplicate exceed the JSCS bioaccumulation screening level. Aroclor 1260 was detected at a concentration of 129 µg/kg (field duplicate was 123 µg/kg), which does not exceed the JSCS screening level.

For the Subbasin 2 sample, Aroclor 1254 was detected at a concentration of 29 µg/kg. This exceeds the JSCS bioaccumulation screening value but not the toxicity screening level. Aroclor 1260 was detected at a concentration of 28 µg/kg, which does not exceed the JSCS screening level.

Because PCBs were identified for additional source investigation, were detected at a concentration above their JSCS bioaccumulation and toxicity screening value in Subbasin 3, and were detected in Subbasin 3 at concentrations above those observed in river sediments adjacent to the outfall, further evaluation of PCB sources and pathways from Subbasin 3 to the stormwater system is warranted. Further evaluation of PCB sources in Subbasin 2 is also warranted based on the observed exceedance of the JSCS bioaccumulation screening value; however, because of the relatively low concentration, further evaluation of PCB sources in Subbasin 2 should be considered a lower priority.

Other Analytes: Several other analytes had concentrations greater than JSCS screening levels in the representative inline solid samples. These include lead (Figure 3-2), cadmium, copper, and DDTs.

For Subbasin 3, cadmium and lead had substantially higher concentrations than the Subbasin 2 sample and the JSCS screening levels. Copper was only slightly higher than the JSCS screening level and was lower than what was detected in Subbasin 2. 4-4' DDE and total DDT were greater than the JSCS bioaccumulative screening level in the normal sample but were not detected in the field duplicate. The absence of the chemical in stormwater solids discharging to the conveyance system should be confirmed. Although there are no JSCS screening levels for TPH, it should be noted that No. 6 fuel oil and motor oil were detected at relatively high concentrations in the normal and duplicate samples.

For Subbasin 2, cadmium and lead were below the JSCS toxicity screening levels, but cadmium exceeded the JSCS bioaccumulation screening level. In contrast, copper was higher than in Subbasin 3 and exceeded the JSCS toxicity screening level.

Further evaluation of sources and pathways to the stormwater system from Subbasins 2 and 3 has been recommended above. It is also recommended that lead, cadmium, and copper be included in the subbasins where they exceeded the screening levels.

3.4.3 Basin 18 Results

A summary of analytical results for inline solids samples collected from Basin 18 is presented in Table 3-2. The spatial distribution and relative concentrations in inline solids and in river sediment samples are assessed below to determine subbasins that may be sources entering the stormwater conveyance system. As stated above, lead, mercury, phthalates, PAHs, PCBs, and DDT metabolites had been identified for further source investigation work. Results from this evaluation for Basin 18 are presented below by constituent.

Lead: Lead was identified for further source investigation work because elevated concentrations of lead were detected in river sediment samples collected adjacent to the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, April 2004). Concentrations of lead in river sediment ranged from 60.6 to 210 mg/kg, with

an upstream sample concentration of 67.3 µg/kg (CH2M HILL, April 2004). The JSCS screening level is 128 mg/kg.

In Subbasin 1, which represents nearly all of Outfall 18 basin excluding a small portion of the Gunderson facility, lead was detected at a concentration below the JSCS screening value. In fact, lead was below the JSCS level at all of the inline sample locations, with one exception (Figure 3-2).

Lead was detected at 636 mg/kg in the Subbasin 3a sample (manhole AAT557). As stated in Section 2-2, this sample was composed primarily of silt and collected from a ledge of solids located on the side of the stormwater conveyance line (see Photographs 20 and 21 in Appendix C). This material appears to have been deposited during a backup event. It is unclear how long ago this event may have occurred and if this sample is representative of solids currently entering the stormwater conveyance system. No inline solids samples were collected upstream of this location. Lead concentrations were substantially lower in the three inline solids samples collected downstream, suggesting this material is not contributing significantly to downstream solids concentrations.

Further evaluation of current or historical upland sources of lead entering the City stormwater conveyance system in Subbasin 3a is recommended, even though there were lower downstream concentrations and the depositional timeframe of the sample is questionable.

Mercury: Mercury was selected for further source investigation work because some mercury concentrations were above DEQ's baseline values in sediment samples collected in the vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, April 2004). Concentrations of mercury in river sediment adjacent to Outfall 18 ranged from less than 0.010 (nondetect) to 0.453 mg/kg, while the upstream sample was less than 0.128 (nondetect) mg/kg. These concentrations are below the JSCS screening value of 1.06 mg/kg.

All inline solids samples collected in Basin 18 were below the JSCS screening level; concentrations ranged from 0.057 to 0.32 mg/kg (Figure 3-3).

Because mercury concentrations were below the JSCS toxicity screening value at all inline solids sample locations, no further evaluation of upland sources of mercury within Basin 18 is recommended at this time.

Phthalates: Phthalates were previously identified for additional source investigation work because elevated levels were detected in sediment samples collected in the vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, April 2004). Detected phthalate concentration ranges in river sediment adjacent to the outfall include:

- BEHP: < 62.7 to 2,700 µg/kg, upstream sample was estimated at 166 µg/kg (JSCS toxicity screening level = 800 µg/kg and JSCS bioaccumulation screening level = 330 µg/kg)
- Butyl Benzyl Phthalate: < 31 to 385 µg/kg, upstream sample was < 43 µg/kg (no JSCS screening levels)

- Di-n-Butyl Phthalate: One detected value at an estimated 185 µg/kg, with detection limits ranging from 133 to 185 µg/kg (JSCS toxicity screening level = 100 µg/kg)
- Di-n-Octyl Phthalate: One detected value at 190 µg/kg, with detection limits ranging from 40.9 to 58.9 µg/kg (no JSCS screening levels)

BEHP was detected in five of the six samples collected (Figure 3-5).

For the sample closest to the outfall (representing Subbasin 1), BEHP had the highest concentration at 1,640 µg/kg, with detected concentrations within the other subbasins ranging from 576 to 1,020 µg/kg.

Di-n-butyl phthalate was also detected in the Subbasin 1 sample at 558 µg/kg, but it was not detected in any of the other subbasins.

The only other detected phthalate in any of the subbasin samples was butyl benzyl phthalate, which was detected at an estimated 1,040 µg/kg in Subbasin 3b.

Because phthalates were detected at concentrations above JSCS bioaccumulation and toxicity screening values, further investigation of upland sources within Basin 18 is warranted.

PAHs: PAHs were identified for further source investigation work because river sediment concentrations of LPAHs and HPAHs, along with two individual PAHs (2-methylnaphthalene and indeno[1,2,3-cd]pyrene), exceeded their respective DEQ High sediment screening values, although no distinguishable concentration gradient from the outfall was identified (CH2M HILL, April 2004). PAH ranges detected in river sediment adjacent to the outfall (CH2M HILL, April 2004) include:

- Total PAHs: 1,509 to 4,335 µg/kg, upstream sample was 1,509 µg/kg (no JSCS screening level)
- 2-Methylnaphthalene: < 2.8 (nondetect) to 210 µg/kg, upstream sample was < 3.53 µg/kg (JSCS screening level = 200 µg/kg)
- Acenaphthylene: < 6.85 (nondetect) to 51 µg/kg, upstream sample was < 9.87 µg/kg (JSCS screening level = 200 µg/kg)
- Benzo[g,h,i]perylene: < 2.52 (nondetect) to 256 µg/kg, upstream sample was < 3.74 µg/kg (JSCS screening level = 300 µg/kg)
- Indeno(1,2,3-cd)pyrene: < 3.56 (nondetect) to 118 µg/kg, upstream sample was < 5.28 µg/kg (JSCS screening level = 100 µg/kg)

LPAHs and HPAHs were detected in the inline solids samples collected (Figures 3-8 and 3-9).

For Subbasin 1, benzo(g,h,i)perylene was detected above its JSCS screening value of 300 µg/kg with an estimated value of 338 µg/kg. Benzo(g,h,i)perylene was also detected in the samples representing Subbasins 3a and 3b, at estimated values of 1,560 and 338 µg/kg, respectively, although it was not detected in the Subbasin 3 sample (which is supposed to

represent a composite of Subbasins 3a and 3b). The Subbasin 3a sample was collected from a ledge on the side of the storm pipe so may not be representative of recent solids in the line.

No other PAHs exceeded JSCS screening levels in Subbasin 1 (the sample location closest to the outfall). But there were several other exceedances, within Subbasins 3a and 3b. JSCS screening levels were exceeded for 2-methylnaphthalene and acenaphthylene in Subbasin 3a and for indeno(1,2,3-cd)pyrene in Subbasins 3a and 3b. For all three of these PAHs, concentrations were highest in the shelf sample collected in Subbasin 3a.

The spatial distribution of PAHs within the stormwater network suggests potential sources of PAHs in Subbasins 1, 3a, and 3b. The estimated total PAH concentration in the Subbasin 1 sample was 2,444 mg/kg. Three samples were collected directly upstream of this sample location and were representative of solids emanating from Subbasins 2, 3, and 4 (see Figure 2-3). PAHs did not exceed the JSCS screening value in any of these upstream samples, and the total estimated PAH concentrations were substantially lower; the total estimated PAH concentration in each of these subbasins is as follows: Subbasin 2—329 µg/kg; Subbasin 3—less than 87 µg/kg (nondetect); and Subbasin 4—595 µg/kg.

The PAH distribution may indicate a source of PAHs within Subbasin 1 downstream of sampling locations for Subbasins 2, 3, and 4. The Burlington Northern Santa Fe (BNSF) rail yard is located between these sample locations and has been identified as a potential source of PAHs (CH2M HILL, April 2004). Additionally, during the collection of inline solids from manhole AMZ086, groundwater infiltration was noted entering the stormwater system. This observation suggests the possibility of a potential groundwater pathway for PAHs, between manhole AMZ086 and the downgradient manhole AMZ094, to enter the City stormwater system.

Because PAHs were detected above their respective JSCS toxicity screening levels, further investigation of PAH sources and pathways to the City stormwater system is warranted in Subbasins 1 and 3. As stated above, sources of PAHs and pathways in the area of the rail yard should be evaluated as part of the DEQ remedial investigation/feasibility study (RI/FS) site investigation. Additionally, PAH-contaminated groundwater at sites within Basin 18 should be evaluated as part of upland site investigations to determine whether it is entering the City conveyance system and affecting inline solid concentrations.

PCBs: PCBs were identified for further source investigation work because elevated levels were detected in sediment samples collected in the immediate vicinity of the outfall, although no distinguishable concentration gradient was identified (CH2M HILL, April 2004). Total PCB and detected aroclor concentration ranges in river sediment adjacent to the outfalls include:

- Total PCBs: 647 to 6,400 µg/kg, upstream sample was 93.3 µg/kg (JSCS toxicity screening level = 676 µg/kg)
- Aroclor 1248: 32.6 to 407 µg/kg, upstream sample was 54.5 µg/kg (JSCS toxicity screening level = 1,500 µg/kg and JSCS bioaccumulation screening level = 4 µg/kg)
- Aroclor 1254: 18.7 to 159 µg/kg, upstream sample was 24.5 µg/kg (JSCS toxicity screening level = 300 µg/kg and JSCS bioaccumulation screening level = 10 µg/kg)

- Aroclor 1260: < 3.21 to 52.1 µg/kg, upstream sample was 14.3 µg/kg (JSCS toxicity screening level = 200 µg/kg)

PCBs were detected in three of the six samples collected (Figure 3-6). Only Aroclors 1254 and 1260 were detected in any of these samples.

The sample closest to the outfall (representing Subbasin 1) had only one Aroclor (Aroclor 1254) detected at 130 µg/kg. Only one other sample had a detection of Aroclor 1254; that was in Subbasin 4 at 187 µg/kg. This suggests a potential source of PCBs in Subbasin 4 (and potentially in the area between the sample locations for Subbasins 1 and 4).

In Subbasin 3a (see Figure 2-3), Aroclor 1260 was detected at 624 µg/kg, which is above the JSCS toxicity screening level, but was not detected in downstream samples. As stated above in Section 2-2, the Subbasin 3a sample was collected from a ledge of solids located on the side of the stormwater conveyance line (see Photographs 20 and 21 in Appendix C). This material appears to have been deposited during a backup event. It is unclear how long ago this event may have occurred and whether this sample is representative of solids currently entering the stormwater conveyance system.

Because Aroclor 1254 was detected at a concentration above the JSCS bioaccumulation screening value and a slight concentration gradient was observed in the downstream sample, further investigation of upland sources within Subbasin 4 and in the area between Subbasin 4 and the river is warranted.

Further evaluation of current or historical upland sources of PCBs entering the City stormwater conveyance in Subbasin 3a is also recommended, even though the depositional timeframe of the sample is questionable and Aroclor 1260 was not detected in downstream samples.

DDT: DDT metabolites were identified for further source investigation because elevated levels were detected in sediment samples collected in the vicinity of the outfall. No apparent concentration gradient exists around the outfall (CH2M HILL, April 2004). Total DDT and metabolite concentration ranges in river sediment adjacent to the outfalls include:

- Total DDTs: 20.1 to 178.5 µg/kg, upstream sample was 79.2 µg/kg (JSCS bioaccumulation screening level = 0.3 µg/kg)
- 4-4′-DDD: 7.13 to 82.7 µg/kg, upstream sample was 14.1 µg/kg (JSCS toxicity screening level = 28 µg/kg and JSCS bioaccumulation screening level = 0.3 µg/kg)
- 4-4′-DDE: 13 to 124 µg/kg, upstream sample was 65.1 µg/kg (JSCS toxicity screening level = 31.3 µg/kg and JSCS bioaccumulation screening level = 0.3 µg/kg)
- 4-4′-DDT: Not detected, with detection limits approximately less than 0.7 µg/kg (JSCS toxicity screening level = 62.9 µg/kg and JSCS bioaccumulation screening level = 0.3 µg/kg)

DDTs were detected in two of the six samples collected (Figure 3-7). For the sample closest to the outfall (representing Subbasin 1), all DDT metabolites were below detection levels.

Low levels of DDT metabolites were detected in Subbasin 4. 4,4′ DDE and 4,4′ DDD were detected at 12 and 21 µg/kg, respectively, which are above the JSCS bioaccumulation screening values but below the JSCS toxicity screening values. Concentrations of DDT metabolites in this sample were below the maximum concentration observed in river sediment samples collected adjacent to the outfall.

The highest concentrations of DDT metabolites were in Subbasin 3a: 4,4′ DDD, 4,4′ DDE, and 4,4′ DDT were detected at 80, 21, and 284 µg/kg, respectively, which are above JSCS screening values. As stated above, the Subbasin 3a sample was collected from a ledge of solids located on the side of the stormwater conveyance line (see Photographs 20 and 21 in Appendix C). It is unclear whether this sample is representative of solids currently entering the stormwater conveyance system.

Because 4,4′ DDE and 4,4′ DDD were detected at concentrations above their respective JSCS bioaccumulative screening values, further investigation of upland sources within Subbasin 4 is warranted.

Further evaluation of current or historical upland sources of DDTs entering the City stormwater conveyance in Subbasin 3a is also recommended.

Other Analytes: Several other analytes had concentrations greater than JSCS screening levels in the representative inline solid samples. These include cadmium, chromium, copper, zinc, and chlordane.

All six samples exceeded the JSCS bioaccumulation screening level (0.003 mg/kg) for cadmium; however, only the sample from Subbasin 3a exceeded the JSCS toxicity screening level (4.98 mg/kg). This sample was an order of magnitude higher than the other samples, suggesting a source within the subbasin. This sample also exceeded the JSCS toxicity screening levels for chromium and copper. All samples exceeded the JSCS bioaccumulation screening levels for copper and zinc. Subbasin 2 also exceeded the copper JSCS toxicity screening level.

The Subbasin 3a sample concentration for chlordane was 512 µg/kg. The JSCS toxicity screening level for chlordane is 17.6 µg/kg.

Although there are no JSCS screening levels for TPH, it should be noted that motor oil was detected at relatively high concentrations in the Subbasin 3a sample, as well.

Further evaluation of sources and pathways to the stormwater system of targeted contaminants from each subbasin has been recommended above. It is also recommended that cadmium, chromium, copper, zinc, and chlordane be included in the subbasins where they exceeded the screening levels.

SECTION 4

Inline Solids Sampling Lessons Learned

4.1 Sample Collection

Overall, collection of representative samples was a success in Basin 18. Samples representative of stormwater solids were collected in all of the proposed subbasins with only minor modifications to the original sample locations.

However, the successful collection of samples in Basin M-1 was severely limited because of the lack of soil-derived inline solids material. There was only one proposed sample location in Basin M-1 that had representative stormwater solids. Field reconnaissance showed that there were very little representative soil-derived solids within any of the lines; only one other alternate location was found that had representative solids. At the four remaining locations (of a total of six) in Basin M-1, the inline solids were determined to be precipitate from groundwater intrusion into the stormwater conveyance system and were not representative of solids entering the stormwater system from facilities located in the subbasin.

Three distinctly different sample types were observed during the inline solids investigation in Basins M-1 and 18:

- Medium- to fine-grained sand was observed at seven sample locations.
- Orange-brown groundwater precipitate was observed at four sample locations.
- Gray silt with little to no sand was observed at one location.

Of these sample types, only the soil-derived material (sand and silt) was determined to be representative of solids entering the stormwater conveyance system from facilities located in the subbasin. The samples were successfully collected using methods outlined in the work plan.

4.2 Access

Access to sample locations was limited by the following factors:

- High traffic flow on streets and in front of large sites limited the times at which some of the manholes could be accessed. Traffic control issues need to be planned ahead of time in areas of high traffic flow and should be considered part of the site reconnaissance.
- In areas of high traffic flow, nighttime sampling may be required to prevent congestion.

4.3 Timely Completion

Timely collection of samples was limited by the following factors:

- Presence or absence of solids at the primary manhole locations. Mobilization and setup at each manhole took one to two hours, depending on traffic control.
- Accuracy of City stormwater sewer line maps. Verification of the accuracy of the City's stormwater sewer line maps should be part of the site reconnaissance.

SECTION 5

Findings and Recommendations

As stated in Section 1, the inline sampling described in this report was intended to identify subbasins where contamination may have entered the City's stormwater conveyance system. While elevated levels of chemicals in inline solids can provide evidence that chemicals have been released into the stormwater conveyance system, the absence of inline solids or the absence of chemicals in solids does not provide evidence that such releases have not occurred or that those subbasins do not require further investigation. Factors such as slope of storm lines, water velocity, particle sizes and densities, organic content of solids, the frequency and timing of releases to the stormwater system, and other considerations affect the presence and composition of inline solids.

Inline sampling data can provide useful information on the presence of chemicals in the stormwater system and possible transport to the Willamette River. It should be noted, however, that they may not correlate with concentrations of contaminants in river sediments because of fate and transport and river processes (deposition and erosion) occurring in the river.

The results of this pilot project will assist the City in focusing source control efforts within a basin and are intended to assist the DEQ Cleanup Program project managers as they evaluate the stormwater pathways at upland sites with a City Outfall Basin.

5.1 General Investigation Findings

General findings of the inline solids sampling investigations in Basins M-1 and 18 are summarized below:

- Pre-designated sampling locations may not always contain inline solid materials. At several locations, solids were not present at the preferred sample location but were collected at alternative sample locations.
- Inline solids samples collected may not always be representative of sources of solids entering the stormwater conveyance system from facilities located within the basin. Several of the samples collected in Basin M-1 appear to be the result of metals precipitating out of solution from groundwater intrusion in the stormwater conveyance system.
- Differences in the composition of representative inline solids samples, such as the amount of silt versus sand or the varying amounts of different particulate types (e.g. paint chips, plastic fragments, or metal), can affect the analytical results for some constituents. These variations in sample composition result in uncertainty when evaluating the spatial distribution or concentration gradients of contaminants within a basin.

- Contaminants were detected in several subbasins in both Basins M-1 and 18. Concentrations varied considerably among subbasins, and several subbasins were identified as potential source subbasins within each basin.
- Concentrations of cadmium, copper, and zinc exceeded JSCS bioaccumulative screening values in various subbasins within Basins M-1 and 18. The bioaccumulative screening values for cadmium and zinc, and to a lesser degree copper, are likely greater than the natural background for soils.

5.2 Basin M-1 Findings and Recommendations

Inline solids sample results indicated that within Basin M-1, potential upland sources of contaminants are present in Subbasins 2 and 3.

Subbasin 2
For Subbasin 2, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Copper
- Phthalates (BEHP)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Cadmium
- Zinc
- PCBs (Aroclor 1254)

Exceedances of JSCS screening values suggest sources within the subbasin. These detections were significantly lower than the maximum concentration observed in river sediment samples collected adjacent to the outfall, indicating that Subbasin 2 is not a substantial upland source.

The Subbasin 2 sample was collected close to the terminus of the City storm line, and there are no adjacent sites that are in DEQ's Cleanup Program. The City will evaluate site connections and activities in this subbasin to determine whether additional source control work is warranted.

Subbasin 3
For Subbasin 3, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Cadmium
- Chromium
- Copper
- Lead
- Zinc
- Phthalates (BEHP and Di-n-Butyl Phthalate)

- PCBs (Aroclor 1254)
- PAHs (2-Methylnapthalene and Phenanthrene)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- DDT

Additionally, TPH (No. 6 fuel oil and motor oil) was relatively high in the Subbasin 3 sample. While there are no JSCS screening levels for this contaminant, further analysis may assist with subsequent source control investigations.

Subbasin 3 is located in the northern end of Basin M-1 and drains the western portion of the Freightliner TMP. On the basis of City records, there are no other inlets or connections to the manhole sampled for Subbasin 3. This facility has been identified as a potential source of PAHs, metals, and phthalates in past evaluations conducted by the City (CH2M HILL, January 2003). The site is currently in the RI/FS investigation process under the oversight of DEQ. Further evaluation of potential sources of these contaminants and pathways to the City stormwater system from the Freightliner TMP site is warranted based on results of the inline solids sampling results. Because of the number of contaminants detected above the JSCS screening values and the magnitude of the detections, further evaluation should be conducted as part of DEQ's RI/FS site investigation.

It is not possible to identify other sources to the Basin M-1 stormwater system based on the inline sampling because of the lack of stormwater-derived solids in the other subbasins. Additional evaluation of sources in other subbasins may be required to be protective of sediment and water quality. Based on the dry-weather flow observations, a more thorough evaluation of liquids entering the stormwater system may assist with subsequent source control investigations.

5.3 Basin 18 Findings and Recommendations

Inline solids sample results indicated that within Basin 18, potential upland sources of contaminants are present in Subbasins 1, 2, 3a, 3b, and 4.

Subbasin 1
For Subbasin 1, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Phthalates (BEHP and Di-n-Butyl Phthalate)
- PAHs (Benzo(g,h,i) perylene)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Cadmium
- Copper
- Zinc
- PCBs (Aroclor 1254)

In addition to source investigations in the other subbasins, as discussed below, potential sources of these contaminants and pathways from the area of the BNSF rail yard should be evaluated.

Subbasin 2
For Subbasin 2, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Copper

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Cadmium
- Zinc
- Phthalates (BEHP)

Subbasin 3a
For Subbasin 3a, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Cadmium
- Chromium
- Copper
- Lead
- PCBs (Aroclor 1260)
- DDTs
- Chlordanes
- PAHs (2-Methylnapthalene, Acenapthalene, Benzo(g,h,i) perylene, and Indeno(1,2,3-cd) pyrene)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Zinc

Additionally, the TPH (motor oil) concentration was relatively high in the Subbasin 3a sample. While there are no JSCS screening levels for this contaminant, further analysis may assist with subsequent source control investigations. As stated above, this sample was composed primarily of silt and collected from a ledge of solids located on the side of the stormwater conveyance line (see Photographs 20 and 21 in Appendix C). This material appears to have been deposited during a backup event. It is unclear how long ago this event may have occurred and whether this sample is representative of solids currently entering the stormwater conveyance system. Additionally, concentrations of all these chemicals were not detected above their screening values in the sample collected immediately downstream of this location. Therefore, while further evaluation of sources of these chemicals and pathways to the City stormwater system is warranted in Subbasin 3a, sources of these contaminants may be historical.

Subbasin 3b
For Subbasin 3b, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Phthalates (BEHP)
- PAHs (Benzo(g,h,i) perylene and Indeno(1,2,3-cd) pyrene)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Cadmium
- Copper
- Zinc

The PAH detection was lower than the maximum concentration observed in river sediment collected adjacent to the outfall, and no PAHs were detected in the inline solids sample collected immediately downstream of this location.

Subbasin 4
For Subbasin 4, the following contaminants warrant further evaluation because they exceed either the JSCS toxicity or bioaccumulative screening levels:

Concentrations greater than the JSCS Toxicity Screening Levels

- Phthalates (BEHP)

Concentrations greater than the JSCS Bioaccumulative Screening Levels

- Cadmium
- Copper
- Zinc
- PCBs (Aroclor 1254)
- DDTs

Additionally, during the collection of inline solids from manhole AMZ086 (representing Subbasin 4), groundwater intrusion was noted entering the stormwater system. This indicates that a potential groundwater pathway for contaminants entering the City stormwater system may be present.

SECTION 6

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Tables

TABLE 2-1
Basin M-1—Summary of Sample Locations
Source Control Pilot Project

Subbasin Assessed	Entrance Manhole	Sample Collected	Solids Description	Field Observations
Subbasin 1	AAM107	No solids present.	--	--
	AAM104	IL-M1-AAM104-0803-SW	Groundwater precipitate with 5 percent sand	• Closest upstream manhole to AAM107. • Sample collected 0 to 20 feet downstream (southwest) of manhole AAM 104, in the 60-inch pipe. • No debris.
Subbasin 4	AAM104	IL-M1-AAM104-0803-NE	Groundwater precipitate	• Sample collected 0 to 6 feet upstream (northeast) of manhole AAM 104, in the 54-inch pipe. • No debris.
Subbasin 6	AAJ933	IL-M1-AAJ933-0803	Groundwater precipitate	• Sample collected 0 to 10 feet downstream of manhole AAJ 933, in the 54-inch pipe. • Unidentified lateral joins the main line at this manhole from the north. A review of facility stormwater control plans indicated that this lateral drains a portion of the Freightliner truck manufacturing plant (TMP). • No debris.
Subbasin 2	AAM 105	No solids present.	--	--
	AAJ 144	No solids present.	--	• Closest upstream manhole to AAM105.
	AAJ 155	IL-M1-AAJ155-0803	WELL GRADED SAND, black and brown, medium grain	• Second closest upstream manhole to AAM105. • Sample collected downstream of manhole, in 24-inch line. • Solids appeared brown in the upper 1 inch and black in the lower 2 inches. Faint petroleum odor observed during collection and a moderate sheen observed on sample pore water. Metal debris (nuts and washers) observed at manhole, but not in sample.

TABLE 2-1
Basin M-1—Summary of Sample Locations
Source Control Pilot Project

Subbasin Assessed	Entrance Manhole	Sample Collected	Solids Description	Field Observations
Subbasin 5	AAJ 810	No solids present.	--	--
	AAJ 817	No solids present.	--	• Closest upstream manhole to AAJ810.
	AAJ 829	IL-M1-AAJ829-0803	Groundwater precipitate	• Second closest upstream manhole to AAM810. • Sample collected 80 feet downstream of manhole (in the 36-inch pipe) directly below lateral junction, on the side of the pipe. Appears to be the result of precipitation from groundwater intrusion. • No debris.
Subbasin 3	AAJ 831	IL-M1-AAJ831-0803 IL-M1-XXY101-0803 (field duplicate)	POORLY GRADED SAND, dark gray, fine to medium grain	• Sample collected at manhole which is located at the end of the City system; private lateral from Freightliner TMP enters the manhole from the northeast. • Large amount of paint chips observed in sample (1 percent).

TABLE 2-2
Basin M-1—Summary of Dry-Weather Flow Observations at Attempted Sample Locations
Source Control Pilot Project

Entrance Manhole	Upstream Subbasins	Approximate Depth of Dry-Weather Flow in Bottom of Pipe	Comments
AAM107	Subbasin 1 (includes subbasins 2, 3, 4, 5, and 6)	0.5 to 1 inch	Iron oxide staining in upstream and downstream lines.
AAM104	Subbasin 1	1 inch	Iron oxide staining and deposits in downstream line.
	Subbasins 4 and 6	1 inch	Iron oxide staining and deposits in upstream line.
	Subbasins 3 and 5	0.5 inch	Iron oxide staining in upstream line.
	Subbasin 2	No flow	Minor iron oxide staining in line.
AAJ933	Subbasin 6	1 inch	Two lines enter at manhole AAJ933: 1. City line enters from the northeast and drains subbasin 6. Water in this line was clear, and was approximately 0.5 inch deep. This line had heavy iron oxide staining. 2. A private lateral line enters from the north and drains a portion of the Freightliner TMP site . Water in this line was cloudy and was approximately 0.5 inch deep. No iron oxide staining was observed in this line.
AAM 105	Subbasin 2	No flow	Bottom of line moist with minor iron oxide staining.
AAJ 144	Subbasin 2	No flow	Bottom of line moist with minor iron oxide staining.
AAJ 155	Subbasin 2	No flow	Two inches of standing water at manhole location.
AAJ 810	Subbasins 3 and 5	0.5 inch	No iron oxide staining.
AAJ817	Subbasins 3 and 5		Minor iron oxide staining.
AAJ829	Subbasins 3 and 5	0.5 inch	Two City lines enter at manhole AAJ 829, one from the northeast and one from the northwest. Dry-weather flow from the line entering from the northeast was approximately 0.5 inch deep and clear. No flow was observed in the line entering from the northwest, which runs along Basin Avenue.
AAJ 831	Subbasin 3	0.8 inch	No iron oxide staining in line.

TABLE 2-3
Basin 18—Summary of Sample Locations
Source Control Pilot Project

Subbasin Assessed	Entrance Manhole	Sample ID	Solid Description	Field Observations
Subbasin 1 (includes subbasins 2, 3, and 4)	AMZ094 (AAT537)	IL-18-AAT537-0803	WELL GRADED SAND, gray (with thin layer of orange on surface), medium grain	• Proposed sample location not sampled because line configuration different from City drawings. Moved sample location to next downstream manhole, at junctions of 72-inch pipes • Manhole ID unknown at time of sampling. • Solids at manhole 3 feet long by 1 inch deep; no solids upstream or downstream of this area. • Sheen observed on pore water.
Subbasin 2	AAT452	No sample collected	--	• Proposed sample location could not be located because line configuration different from City drawings.
	AMZ096 (AAT453)	IL-18-AAT453-0803	WELL GRADED SAND, gray (red and black grains), medium grain	• Line configuration different from City drawings; manhole ID unknown at time of sampling. • Sample collected 0 to 2 feet upstream of manhole AMZ096 in the 12-inch pipe. • Small amount of organic material (blades of grass, tree bark). • Small pieces of Styrofoam™.
Subbasin 3	AMZ098 (AAT465)	IL-18-AAT465-0803	POORLY GRADED SAND, black, fine to medium grain	• Line configuration different from City drawings; manhole ID unknown at time of sampling. • Sample collected 60 to 80 feet upstream of manhole AMZ098, in the 48-inch pipe. • Small amount (< 1 percent) of small (1-millimeter) metal shavings.
	AMZ099 (AAT556)	No solids	--	• Line configuration different from City drawings.
Subbasin 3a	AAT557	IL-18-AAT557-0803	SILT, gray (stratified with black, gray, orange layers)	• Sample collected from side of pipe 10 feet upstream of manhole AAT557, in the 42-inch pipe. • No debris observed.

TABLE 2-3
Basin 18—Summary of Sample Locations
Source Control Pilot Project

Subbasin Assessed	Entrance Manhole	Sample ID	Solid Description	Field Observations
Subbasin 3b	AMZ100 (AAT558)	IL-18-AAT558-0803	POORLY GRADED SAND, black, medium to fine grain	• Line configuration different from City drawings; manhole ID unknown at time of sampling. • Sample collected 20 to 26 feet downstream of manhole AMZ100, in the 36-inch pipe. • Small amount (< 1 percent) of organic matter (blades of grass, twigs). • Small amount (< 1 percent) of green flakes (unknown).
Subbasin 4	AMZ086 (AAT463)	IL-18-AAT463-0803	WELL GRADED SAND, gray, medium to fine grain	• Line configuration different from City drawings; manhole ID unknown at time of sampling. • Sample collected 30 to 33 feet downstream of manhole AMZ086, in the 42-inch pipe. • Small amount (< 1 percent) red paint chips. • Slight sheen observed on pore water.

Note: Based on an updated drainage map, the current manhole numbers are presented first. Manhole numbers in ( ) were referenced in the sampling plan.

TABLE 2-4
Basin 18—Manhole ID Summary
Source Control Pilot Project

New Manhole ID	Old Manhole ID	Sample ID	Subbasin
AMZ094	AAT537	IL-18-AAT537-0803	1
AMZ096	AAT453	IL-18-AAT493-0803	2
AMZ098	AAT465	IL-18-AAT465-0803	3
AAT557	AAT557	IL-18-AAT557-0803	3a
AMZ100	AAT558	IL-18-AAT558-0803	3b
AMZ086	AAT463	IL-18-AAT463-0803	4

TABLE 2-5
Basin 18—Summary of Dry-Weather Flow Observations at Attempted Sample Locations
Source Control Pilot Project

Entrance Manhole	Upstream Subbasins	Approximate Depth of Dry-Weather Flow in Bottom of Pipe	Comments
AMZ094 (AAT537)	Subbasin 1 (includes subbasins 2, 3, and 4)	2 inch	Iron oxide staining in upstream and downstream lines.
AMZ096 (AAT453)	Subbasin 2	No flow	Bottom of line moist. Iron oxide staining.
AMZ098 (AAT465)	Subbasin 3 (includes subbasins 3a and 3b)	1 inch	Minor iron oxide staining in line.
AAT557	Subbasin 3a	2 inch	Minor iron oxide staining in line.
AMZ099 (AAT556)	Subbasins 3a and 3b	3 inch	Minor iron oxide staining in line.
AMZ 100 (AAT558)	Subbasin 3b	Minimal flow	Minor iron oxide staining in line.
AMZ086 (AAT463)	Subbasin 4	No flow	Six inches of standing water in line. Groundwater intrusion observed downstream of manhole AMZ086.

Table 3-1
Analytical Results from Inline Solids Sampling in Basin M-1
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins: 1 — IL-M1-AAM104-0803-SW 08/12/2003	2 — IL-M1-AAM155-0803 08/13/2003	3 — IL-M1-AAJ831-0803 08/12/2003	3 — IL-M1-XXY101-0803 08/12/2003 (Field Duplicate[d])	4 — IL-M1-AAM104-0803-NE 08/12/2003	6 — IL-M1-AAJ933-0803 08/12/2003
General Chemistry:									
Total Organic Carbon			mg/kg	23,200	10,500	21,000	32,100	29,700	31,900
Metals:									
Arsenic		33	mg/kg	40	4.7	3.4	3.4	47	41
Cadmium	0.003	4.98	mg/kg	**5.3**	**3.3**	**28**	**39**	**6.1**	**5.1**
Chromium	4200	111	mg/kg	51	74	280	420	69	260
Copper	10	149	mg/kg	**116**	**331**	**176**	**171**	**80**	**290**
Lead	128	128	mg/kg	31	106	**645**	**863**	43	21
Mercury		1.06	mg/kg	0.057	0.060	0.064	0.065	0.073	0.068
Zinc	3	459	mg/kg	**1,500**	**309**	**902**	**977**	**1,810**	**1,450**
PCBs:									
Aroclor-1016	420	530	µg/kg	27 U	11 U	13 U	12 U	35 U	36 U
Aroclor-1221			µg/kg	53 U	23 U	26 U	25 U	69 U	71 U
Aroclor-1232			µg/kg	27 U	11 U	13 U	12 U	35 U	36 U
Aroclor-1242	2		µg/kg	27 U	11 U	13 U	12 U	35 U	36 U
Aroclor-1248	4	1,500	µg/kg	27 U	11 U	13 U	12 U	35 U	36 U
Aroclor-1254	10	300	µg/kg	27 U	**29**	**276**	**378**	35 U	36 U
Aroclor-1260		200	µg/kg	27 U	28	129	123	35 U	36 U
Estimated Total PCBs[a,e]		676	µg/kg	--	57	405	501	--	--
Pesticides:									
4,4'-DDD	0.3	28	µg/kg	5.2 U	2.3 U	2.6 U	2.5 U	7.1 U	7.7 U
4,4'-DDE	0.3	31.3	µg/kg	5.2 U	2.3 U	**7.6**	2.5 U	7.1 U	7.7 U
4,4'-DDT	0.3	62.9	µg/kg	5.2 U	2.3 U	2.6 U	2.5 U	7.1 U	7.7 U
Estimated Total DDTs[a,f]	0.3		µg/kg	--	--	**7.6**	--	--	--
4,4'-Methoxychlor			µg/kg	26 U	12 U	13 U	13 U	35 U	38 U
Aldrin		40	µg/kg	2.6 U	1.2 U	8.1	1.3 U	3.5 U	3.8 U
Alpha-BHC			µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
beta-BHC			µg/kg	2.6 U	1.2 U	7.2	1.3 U	3.5 U	3.8 U
Alpha Chlordane		17.6	µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
Chlordane		17.6	µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
delta-BHC			µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
Dieldrin		61.8	µg/kg	5.2 U	2.3 U	2.6 U	2.5 U	7.1 U	7.7 U
Endosulfan I			µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
Endosulfan II			µg/kg	5.2 U	2.3 U	16	2.5 U	7.1 U	7.7 U
Endosulfan Sulfate			µg/kg	5.2 U	2.3 U	2.6 U	2.5 U	7.1 U	7.7 U
Endrin		207	µg/kg	5.2 U	2.3 U	17	2.5 U	7.1 U	7.7 U
Endrin Aldehyde			µg/kg	5.2 U	2.3 U	17	2.5 U	7.1 U	7.7 U
Endrin Ketone			µg/kg	5.2 U	2.3 U	2.6 U	2.5 U	7.1 U	7.7 U
Heptachlor		10	µg/kg	2.6 U	1.2 U	1.7	1.3 U	3.5 U	3.8 U
Heptachlor Epoxide		16	µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
Lindane		4.99	µg/kg	2.6 U	1.2 U	1.3 U	1.3 U	3.5 U	3.8 U
Toxaphene			µg/kg	260 U	115 U	128 U	127 U	353 U	384 U
Semivolatile Organic Compounds:									
1,2,4-Trichlorobenzene		9,200	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
1,2-Dichlorobenzene		1,700	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
1,3-Dichlorobenzene		300	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
1,4-Dichlorobenzene		300	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2,4,5-Trichlorophenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2,4,6-Trichlorophenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2,4-Dichlorophenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U

Table 3-1
Analytical Results from Inline Solids Sampling in Basin M-1
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins					
				1	2	3	3	4	6
				IL-M1-AAM104-0803-SW 08/12/2003	IL-M1-AAM155-0803 08/13/2003	IL-M1-AAJ831-0803 08/12/2003	IL-M1-XXY101-0803 08/12/2003 (Field Duplicate[d])	IL-M1-AAM104-0803-NE 08/12/2003	IL-M1-AAJ933-0803 08/12/2003
2,4-Dimethylphenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2,4-Dinitrophenol			µg/kg	3,490 U	1,560 U	1,730 U	1,680 U	4,880 U	4,980 U
2,4-Dinitrotoluene			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2,6-Dinitrotoluene			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2-Chloronaphthalene			µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
2-Chlorophenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2-Methylphenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2-Nitroaniline			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
2-Nitrophenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
3&4-Methylphenol			µg/kg	1,390 U	625 U	690 U	674 U	1,950 U	1,990 U
3,3'-Dichlorobenzidine			µg/kg	1,390 U	625 U	690 U	674 U	1,950 U	1,990 U
3-Nitroaniline			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4,6-Dinitro-2-Methylphenol			µg/kg	3,490 U	1,560 U	1,730 U	1,680 U	4,880 U	4,980 U
4-Bromophenyl Phenyl Ether			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4-Chloro-3-Methylphenol			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4-Chloroaniline			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4-Chlorophenyl Phenyl Ether			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4-Nitroaniline			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
4-Nitrophenol			µg/kg	1,740 U	782 U	863 U	842 U	2,440 U	2,490 U
Benzoic Acid			µg/kg	3,480 U	1,560 U	1,730 U	1,680 U	4,880 U	4,980 U
Benzyl Alcohol			µg/kg	871 U	391 U	431 U	421 U	1,220 U	1,250 U
Bis(2-Chloroethoxy) Methane			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Bis(2-Chloroethyl) Ether			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Bis(2-Chloroisopropyl) Ether			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Bis(2-Ethylhexyl) Phthalate	330	800	µg/kg	**1,000**	**1,340** J	**14,800**	**16,500**	**1,330**	997 U
Butyl Benzyl Phthalate			µg/kg	871 U	391 U	431 U	421 U	1,220 U	1,250 U
Di-n-Butyl Phthalate		100	µg/kg	697 U	313 U	345 U	1,020	976 U	997 U
Di-n-Octyl Phthalate			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Dibenzofuran			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Diethyl Phthalate		600	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Dimethyl Phthalate			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Hexachlorobenzene		100	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Hexachlorobutadiene		600	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Hexachlorocyclopentadiene		400	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Hexachloroethane			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Isophorone			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
n-Nitrosodi-n-Propylamine			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
n-Nitrosodiphenylamine			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Nitrobenzene			µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Pentachlorophenol		1,000	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Phenol		50	µg/kg	697 U	313 U	345 U	337 U	976 U	997 U
Polycyclic Aromatic Hydrocarbons:									
2-Methylnaphthalene		200	µg/kg	174 U	78 U	2,380	3,800	244 U	249 U
Acenaphthene		300	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Acenaphthylene		200	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Anthracene		845	µg/kg	174 U	85 J	86 U	84 U	244 U	249 U
Fluorene		536	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Naphthalene		561	µg/kg	174 U	78 U	368	510	244 U	249 U
Phenanthrene		1,170	µg/kg	174 U	94 J	1,290	2,640	244 U	249 U
Estimated Total LPAHs[a,b]			µg/kg	--	179	4,038	6,950	--	--

Table 3-1
Analytical Results from Inline Solids Sampling in Basin M-1
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins					
				1	2	3	3	4	6
				IL-M1-AAM104-0803-SW 08/12/2003	IL-M1-AAM155-0803 08/13/2003	IL-M1-AAJ831-0803 08/12/2003	IL-M1-XXY101-0803 08/12/2003 (Field Duplicate[g])	IL-M1-AAM104-0803-NE 08/12/2003	IL-M1-AAJ933-0803 08/12/2003
Benzo (a) anthracene		1,050	µg/kg	174 U	87 J	86 U	84 U	244 U	249 U
Benzo (a) pyrene		1,450	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Benzo [g,h,i] perylene		300	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Benzofluoranthenes		13,000	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Dibenzo (a,h) anthracene		1,300	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Fluoranthene		2,230	µg/kg	174 U	217 J	292	900	244 U	249 U
Indeno (1,2,3-cd) pyrene		100	µg/kg	174 U	78 U	86 U	84 U	244 U	249 U
Pyrene		1,520	µg/kg	174 U	252 J	602	1,030	244 U	249 U
Chrysene		1,290	µg/kg	174 U	142 J	86 U	84 U	244 U	249 U
Estimated Total HPAHs[a,c]			µg/kg	--	698	894	1,930	--	--
Estimated Total PAHs[a,d]			µg/kg	--	877	4,932	8,880	--	--
TPH - HCID:									
Diesel by Dx			mg/kg	50 U	50 U	50 J	50 J	50 U	50 U
Gas by HCID			mg/kg	20 U	20 U	20 J	20 J	20 U	20 U
Heavy Oil by HCID			mg/kg	100 U	100 U	100 J	100 J	100 U	100 U
Oil, Lube			mg/kg	100	100	100 J	100 J	100	100
Other			mg/kg	100 U	100 U	100 UJ	100 UJ	100 U	100 U
TPH - Dx:									
Diesel by Dx			mg/kg	25 U	250 U	250 U	250 U	25 U	25 U
Fuel Oil, No. 6			mg/kg	234	919	7,240	5,300	162	314
Kerosene			mg/kg	25 U	250 U	250 U	250 U	25 U	25 U
Motor Oil			mg/kg	1,420	2,130	11,700	9,230	1,210	2,310
TPH - Gx:									
Gasoline by Gx			mg/kg	NA	NA	221 J	285 J	NA	NA

Notes:

[a] 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.

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

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

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

[e] Total PCBs: Includes all aroclors.

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

[g] Sample IL-M1-XXY101-0803 is a field duplicate of IL-M1-AAJ831-0803.

Abbreviations/Definitions:

-- = Not available or applicable
HPAH = high molecular weight polynuclear aromatic hydrocarbons
LPAH = low molecular weight polynuclear aromatic hydrocarbons
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NA = Not analyzed
PAH = polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
TPH = total petroleum hydrocarbon
Bold = Value greater than JSCS bioaccumulation screening level.
Shading = Value greater than JSCS toxicity screening level.

Qualifiers:

J The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
U The analyte was not detected above the reported sample quantitation limit.

Table 3-2
Analytical Results from Inline Solids Sampling in Basin 18
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins					
				1	2	3	3a	3b	4
				IL-18-AAT537-0803 08/20/2003 Manhole AMZ094	IL-18-AAT453-0803 08/20/2003 Manhole AMZ096	IL-18-AAT465-0803 08/19/2003 Manhole AMZ098	IL-18-AAT557-0803 08/19/2003 Manhole AAT557	IL-18-AAT558-0803 08/19/2003 Manhole AMZ100	IL-18-AAT463-0803 08/19/2003 Manhole AMZ086
General Chemistry:									
Total Organic Carbon			mg/kg	13,000	6,700	5,530	52,900	8,030	13,300
Metals:									
Arsenic		33	mg/kg	5.7	13	5.1	11	4.2	3.0
Cadmium	0.003	4.98	mg/kg	**0.63**	**0.54**	**0.93**	**15**	**0.77**	**0.43**
Chromium	4200	111	mg/kg	55	60	83	188	104	77
Copper	10	149	mg/kg	**101**	**185**	**139**	**151**	**88**	**54**
Lead	128	128	mg/kg	72	78	19	**636**	22	78
Mercury		1.06	mg/kg	0.042	0.035	0.022	0.64	0.031	0.15
Zinc	3	459	mg/kg	**229**	**201**	**268**	**374**	**416**	**193**
PCBs:									
Aroclor-1016	420	530	µg/kg	121 U	127 U	122 U	107 U	132 U	127 U
Aroclor-1221			µg/kg	241 U	253 U	244 U	213 U	265 U	254 U
Aroclor-1232			µg/kg	121 U	127 U	122 U	107 U	132 U	127 U
Aroclor-1242	2		µg/kg	121 U	127 U	122 U	107 U	132 U	127 U
Aroclor-1248	4	1,500	µg/kg	121 U	127 U	122 U	107 U	132 U	127 U
Aroclor-1254	10	300	µg/kg	**130**	127 U	122 U	107 U	132 U	**187**
Aroclor-1260		200	µg/kg	121 U	127 U	122 U	624	132 U	127 U
Estimated Total PCBs[a,e]		676	µg/kg	130	--	--	624	--	187
Pesticides:									
4,4'-DDD	0.3	28	µg/kg	2.5 U	2.5 U	2.5 U	**80**	2.6 U	**12**
4,4'-DDE	0.3	31.3	µg/kg	2.5 U	2.5 U	2.5 U	**21**	2.6 U	**21**
4,4'-DDT	0.3	62.9	µg/kg	25 U	25 U	25 U	**284**	26 U	25 U
Estimated Total DDTs[a,f]	0.3		µg/kg	--	--	--	**385**	--	**33**
4,4'-Methoxychlor			µg/kg	123 U	125 U	127 U	112 U	130 U	124 U
Aldrin		40	µg/kg	6.7	1.3 U	13 U	36	1.3 U	9.1
Alpha-BHC			µg/kg	1.2 U	1.3 U	1.3 U	1.1 U	1.3 U	1.2 U
beta-BHC			µg/kg	1.2 U	1.3 U	1.3 U	1.1 U	1.3 U	1.2 U
Alpha Chlordane		17.6	µg/kg	1.4	1.3 U	1.3 U	152	1.3 U	9.1
Chlordane		17.6	µg/kg	2.3	1.3 U	1.3 U	512	1.3 U	10.0
delta-BHC			µg/kg	1.2 U	1.3 U	1.3 U	26	1.3 U	3.5
Dieldrin		61.8	µg/kg	6.4	4.8	2.5 U	46	2.6 U	14
Endosulfan I			µg/kg	1.2 U	1.3 U	1.3 U	5.8	1.3 U	1.2 U
Endosulfan II			µg/kg	2.5 U	2.5 U	2.5 U	2.2 U	2.6 U	2.5 U
Endosulfan Sulfate			µg/kg	2.5 U	2.5 U	2.5 U	2.2 U	2.6 U	2.5 U
Endrin		207	µg/kg	2.5 U	2.5 U	2.5 U	70	2.6 U	2.5 U
Endrin Aldehyde			µg/kg	2.5 U	2.5 U	2.5 U	198 J	2.6 U	2.5 U
Endrin Ketone			µg/kg	2.5 U	2.5 U	2.5 U	2.2 U	2.6 U	2.5 U
Heptachlor		10	µg/kg	3.3	1.3 U	1.3 U	3.0	1.3 U	1.2 U
Heptachlor Epoxide		16	µg/kg	1.2 U	1.3 U	1.3 U	1.1 U	1.3 U	1.2 U
Lindane		4.99	µg/kg	1.2 U	1.3 U	1.3 U	1.9	1.3 U	1.2 U
Toxaphene			µg/kg	123 U	125 U	127 U	112 U	130 U	124 U
Semivolatile Organic Compounds:									
1,2,4-Trichlorobenzene		9,200	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
1,2-Dichlorobenzene		1,700	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
1,3-Dichlorobenzene		300	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
1,4-Dichlorobenzene		300	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,4,5-Trichlorophenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,4,6-Trichlorophenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,4-Dichlorophenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,4-Dimethylphenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,4-Dinitrophenol			µg/kg	1,640 U	1,690 U	1,730 U	1,490 U	1,770 U	1,640 U
2,4-Dinitrotoluene			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2,6-Dinitrotoluene			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2-Chloronaphthalene			µg/kg	82 U	85 U	87 U	75 U	88 U	82 U

Table 3-2
Analytical Results from Inline Solids Sampling in Basin 18
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins					
				1	2	3	3a	3b	4
				IL-18-AAT537-0803 08/20/2003 Manhole AMZ094	IL-18-AAT453-0803 08/20/2003 Manhole AMZ096	IL-18-AAT465-0803 08/19/2003 Manhole AMZ098	IL-18-AAT557-0803 08/19/2003 Manhole AAT557	IL-18-AAT558-0803 08/19/2003 Manhole AMZ100	IL-18-AAT463-0803 08/19/2003 Manhole AMZ086
2-Chlorophenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2-Methylphenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2-Nitroaniline			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
2-Nitrophenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
3&4-Methylphenol			µg/kg	654 U	676 U	823 J	596 U	708 U	655 U
3,3'-Dichlorobenzidine			µg/kg	654 U	676 U	694 U	596 U	707 U	655 U
3-Nitroaniline			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4,6-Dinitro-2-Methylphenol			µg/kg	1,640 U	1,690 U	1,730 U	1,490 U	1,770 U	1,640 U
4-Bromophenyl Phenyl Ether			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4-Chloro-3-Methylphenol			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4-Chloroaniline			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4-Chlorophenyl Phenyl Ether			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4-Nitroaniline			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
4-Nitrophenol			µg/kg	818 U	845 U	867 U	745 U	884 U	819 U
Benzoic Acid			µg/kg	1,640 U	1,690 U	1,730 U	1,990 J	1,770 U	1,640 U
Benzyl Alcohol			µg/kg	409 U	422 U	434 U	373 U	442 U	410 U
Bis(2-Chloroethoxy) Methane			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Bis(2-Chloroethyl) Ether			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Bis(2-Chloroisopropyl) Ether			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Bis(2-Ethylhexyl) Phthalate	330	800	µg/kg	**1,640** J	**576** J	**990** J	298 U	**917** J	**1,020** J
Butyl Benzyl Phthalate			µg/kg	409 U	422 U	434 U	373 U	1,040 J	410 U
Di-n-Butyl Phthalate		100	µg/kg	558 J	338 U	347 U	298 U	354 U	328 U
Di-n-Octyl Phthalate			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Dibenzofuran			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Diethyl Phthalate		600	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Dimethyl Phthalate			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Hexachlorobenzene		100	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Hexachlorobutadiene		600	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Hexachlorocyclopentadiene		400	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Hexachloroethane			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Isophorone			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
n-Nitrosodi-n-Propylamine			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
n-Nitrosodiphenylamine			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Nitrobenzene			µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Pentachlorophenol		1,000	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Phenol		50	µg/kg	327 U	338 U	347 U	298 U	354 U	328 U
Polycyclic Aromatic Hydrocarbons:									
2-Methylnaphthalene		200	µg/kg	82 U	85 U	87 U	355 J	88 U	82 U
Acenaphthene		300	µg/kg	82 U	85 U	87 U	75 U	88 U	82 U
Acenaphthylene		200	µg/kg	82 U	85 U	87 U	478 J	88 U	82 U
Anthracene		845	µg/kg	82 U	85 U	87 U	260 J	88 U	82 U
Fluorene		536	µg/kg	82 U	85 U	87 U	75 U	88 U	82 U
Naphthalene		561	µg/kg	82 U	85 U	87 U	147 J	88 U	82 U
Phenanthrene		1,170	µg/kg	261 J	85 U	87 U	445 J	143 J	168 J
Estimated Total LPAHs[a,b]			µg/kg	261	--	--	1,685	143	168
Benzo (a) anthracene		1,050	µg/kg	82 U	85 U	87 U	75 U	88 U	82 U
Benzo (a) pyrene		1,450	µg/kg	408 J	85 U	87 U	545 J	217 J	82 U
Benzo [g,h,i] perylene		300	µg/kg	338 J	85 U	87 U	1,560 J	338 J	82 U
Benzofluoranthenes		13,000	µg/kg	577 J	85 U	87 U	796 J	323 J	82 U
Dibenzo (a,h) anthracene		1,300	µg/kg	82 U	85 U	87 U	75 U	88 U	82 U
Fluoranthene		2,230	µg/kg	339 J	134 J	87 U	656 J	218 J	196 J
Indeno (1,2,3-cd) pyrene		100	µg/kg	82 U	85 U	87 U	1,030 J	201 J	82 U
Pyrene		1,520	µg/kg	521 J	195 J	87 U	964 J	190 J	231 J
Chrysene		1,290	µg/kg	82 U	85 U	87 U	75 U	88 U	82 U

Table 3-2
Analytical Results from Inline Solids Sampling in Basin 18
Source Control Pilot Project

Class/Analyte	JSCS (Bioaccumulation)	JSCS (Toxicity)	Units	Subbasins					
				1	2	3	3a	3b	4
				IL-18-AAT537-0803 08/20/2003 Manhole AMZ094	IL-18-AAT453-0803 08/20/2003 Manhole AMZ096	IL-18-AAT465-0803 08/19/2003 Manhole AMZ098	IL-18-AAT557-0803 08/19/2003 Manhole AAT557	IL-18-AAT558-0803 08/19/2003 Manhole AMZ100	IL-18-AAT463-0803 08/19/2003 Manhole AMZ086
Estimated Total HPAHs[a,c]			µg/kg	2,183	329	--	5,551	1,487	427
Estimated Total PAHs[a,d]			µg/kg	2,444	329	--	7,236	1,630	595
TPH - HCID:									
Diesel by Dx			mg/kg	NA	NA	NA	NA	NA	NA
Gas by HCID			mg/kg	NA	NA	NA	NA	NA	NA
Heavy Oil by HCID			mg/kg	NA	NA	NA	NA	NA	NA
Oil, Lube			mg/kg	NA	NA	NA	NA	NA	NA
Other			mg/kg	NA	NA	NA	NA	NA	NA
TPH - Dx:									
Diesel by Dx			mg/kg	250 U	125 U	125 U	250 U	125 U	125 U
Fuel Oil, No. 6			mg/kg	500 U	250 U	250 U	555	250 U	250 U
Kerosene			mg/kg	250 U	125 U	125 U	250 U	125 U	125 U
Motor Oil			mg/kg	1,410	442	679	3,490	786	1,330
TPH - Gx:									
Gasoline by Gx			mg/kg	NA	NA	NA	NA	NA	NA

Notes:

[a] 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.

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

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

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

[e] Total PCBs: Includes all aroclors.

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

[g] Sample IL-M1-XXY101-0803 is a field duplicate of IL-M1-AAJ831-0803.

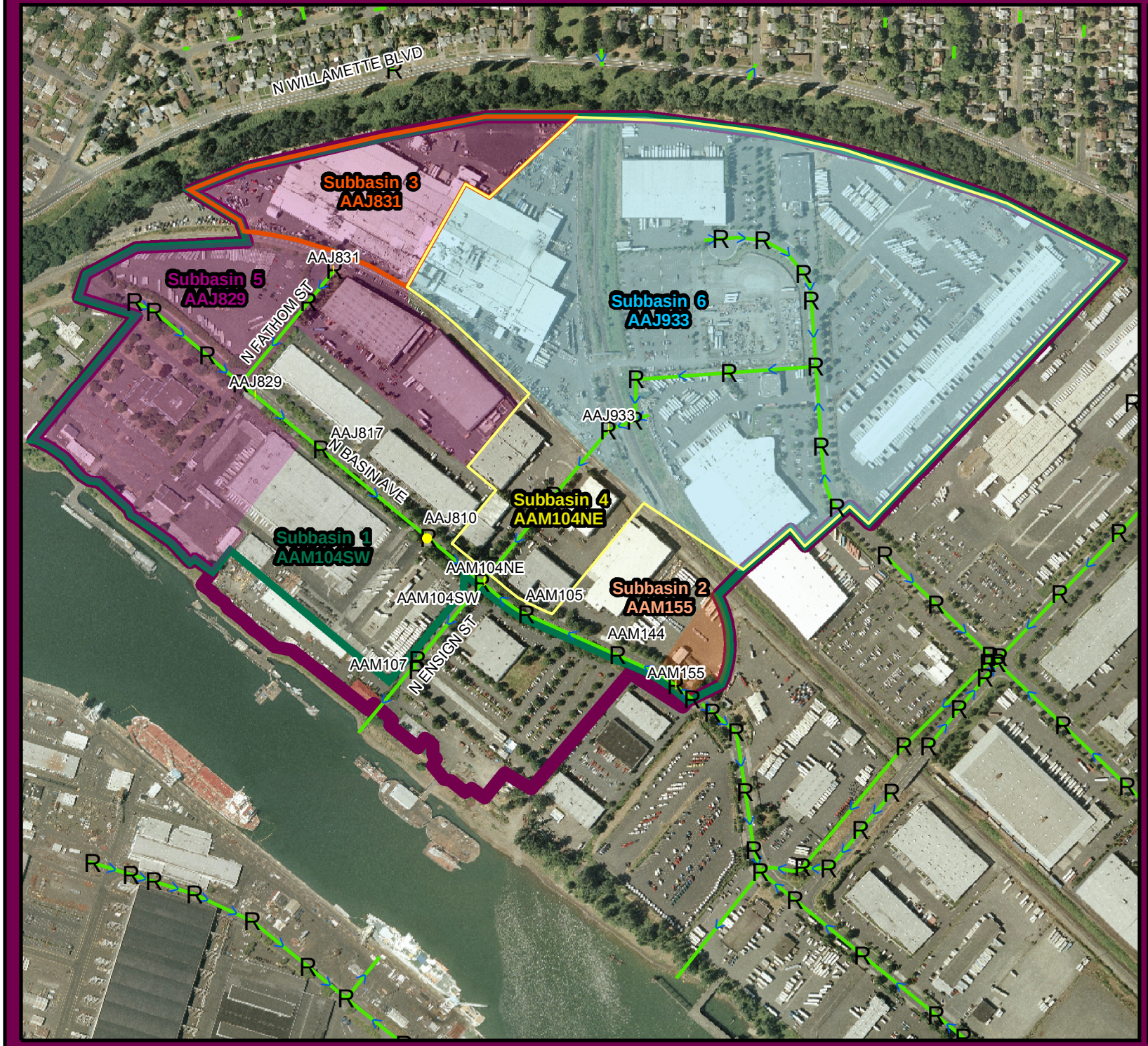
Abbreviations/Definitions:

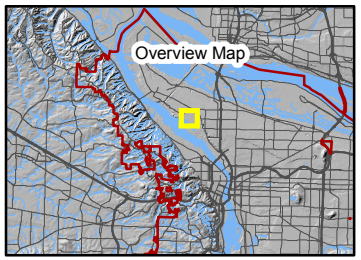
-- = Not available or applicable
HPAH = high molecular weight polynuclear aromatic hydrocarbons
LPAH = low molecular weight polynuclear aromatic hydrocarbons
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NA = Not analyzed
PAH = polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
TPH = total petroleum hydrocarbon
Bold = Value greater than JSCS bioaccumulation screening level.
Shading = Value greater than JSCS toxicity screening level.

Qualifiers:

J The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
U The analyte was not detected above the reported sample quantitation limit.

Figures





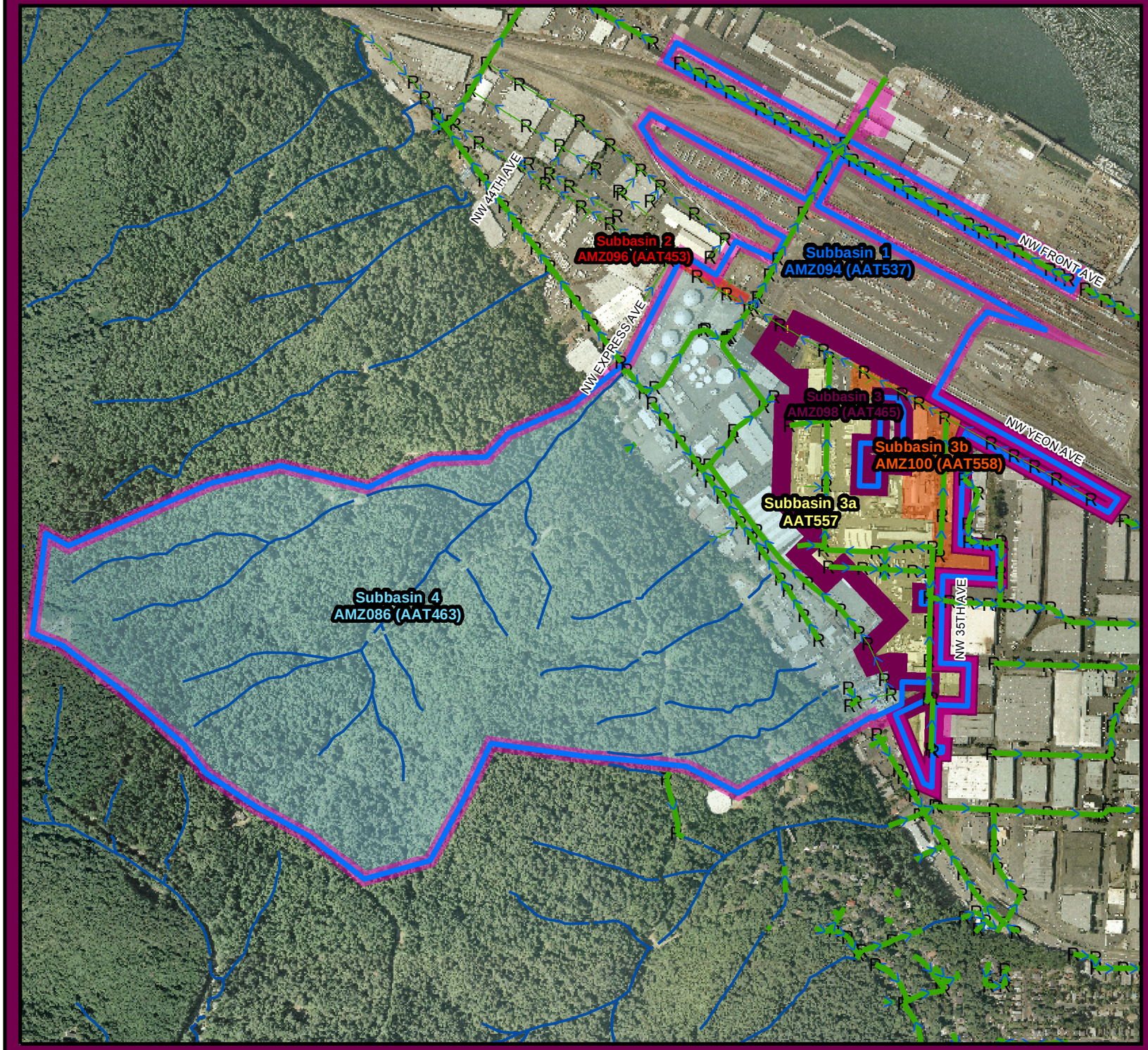
Legend

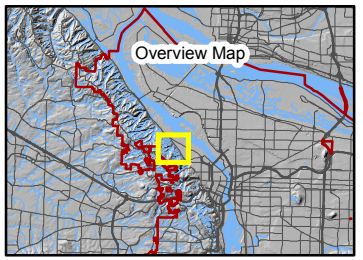
- Sample Location
- Storm Manhole
- Storm Pipe
- Subbasin 1
- Subbasin 2
- Subbasin 3
- Subbasin 4
- Subbasin 5
- Subbasin 6
- Basin M1 Boundary

0 250 500 1000 Feet

Figure 2-1
Outfall M-1 Inline Sampling Locations and Associated Subbasins

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\outfalls\M1\Inline_basin\ figure2_1.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 10/27/05





Legend

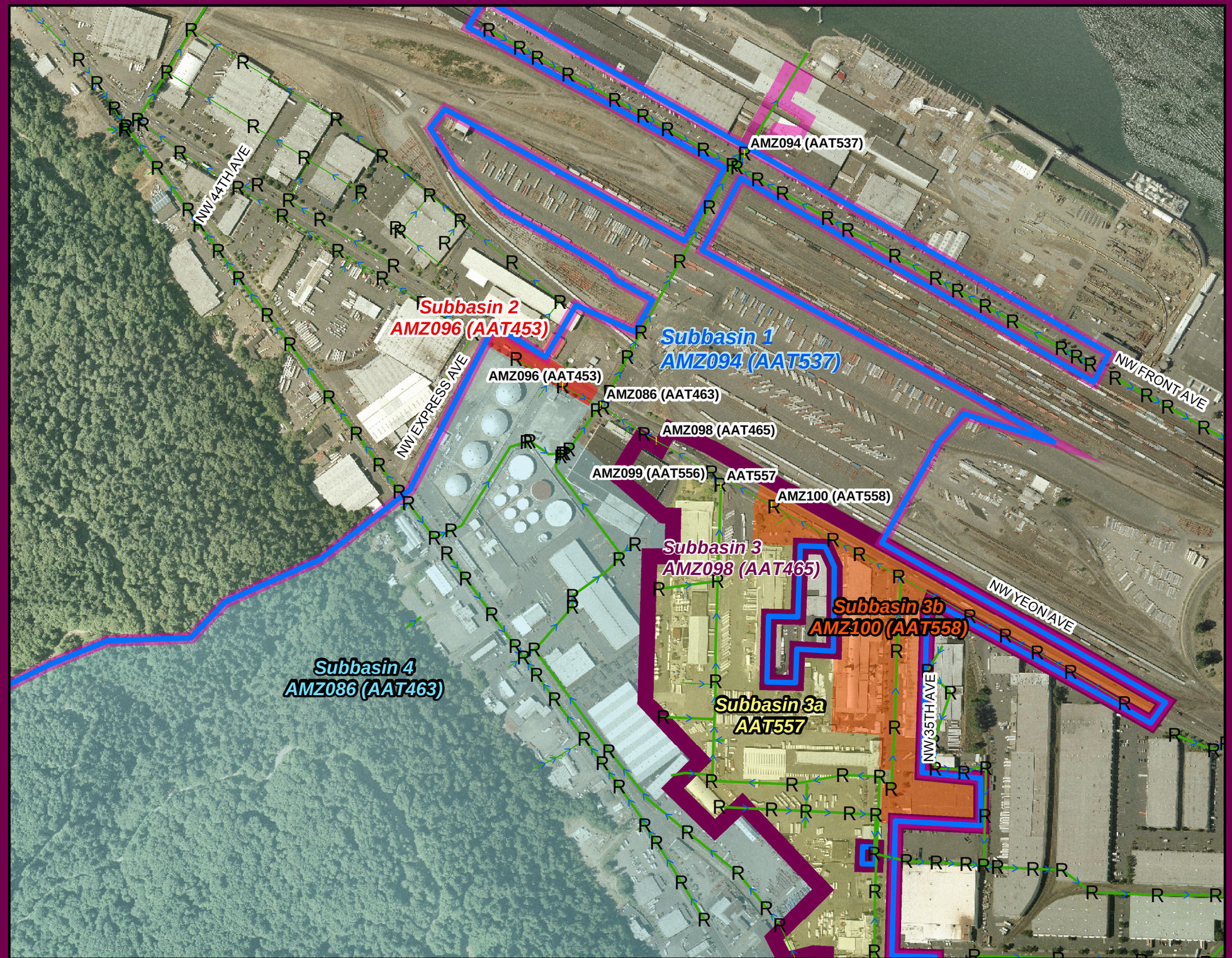
- Sample Location
- Storm Pipe
- R Storm Manhole
- Subbasin 1
- Subbasin 2
- Subbasin 3
- Subbasin 3a
- Subbasin 3b
- Subbasin 4
- Basin 18 Boundary

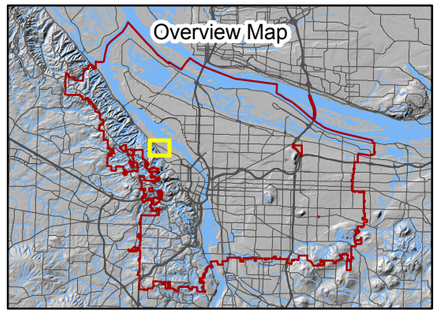
0 250 500 1000 Feet

Figure 2-2

Overview of Outfall 18 Subbasins

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\inline_basin_18\figure2_2.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 10/28/05





Legend

- Sample Location
- Storm Pipe
- R Storm Manhole
- Subbasin 1
- Subbasin 2
- Subbasin 3
- Subbasin 3a
- Subbasin 3b
- Subbasin 4
- Basin 18 Boundary

0 250 500 1000 Feet

Figure 2-3
Outfall 18 Inline Sampling Locations and Associated Sub-Basins

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\inline_basin_18\ figure2-3.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 10/28/05

Figure 3-1 Chromium Concentrations Inline Solids

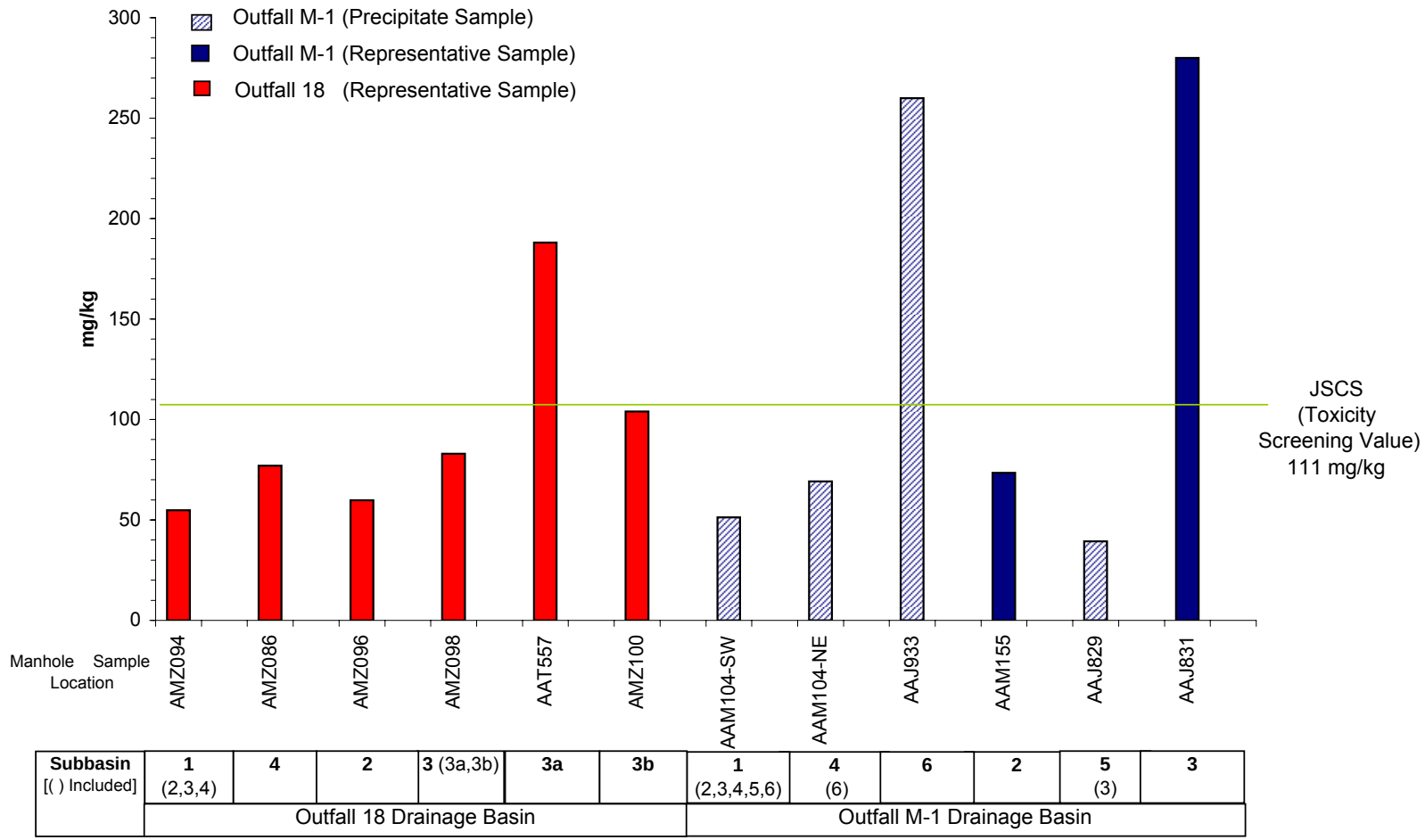


Figure 3-2 Lead Concentrations Inline Solids

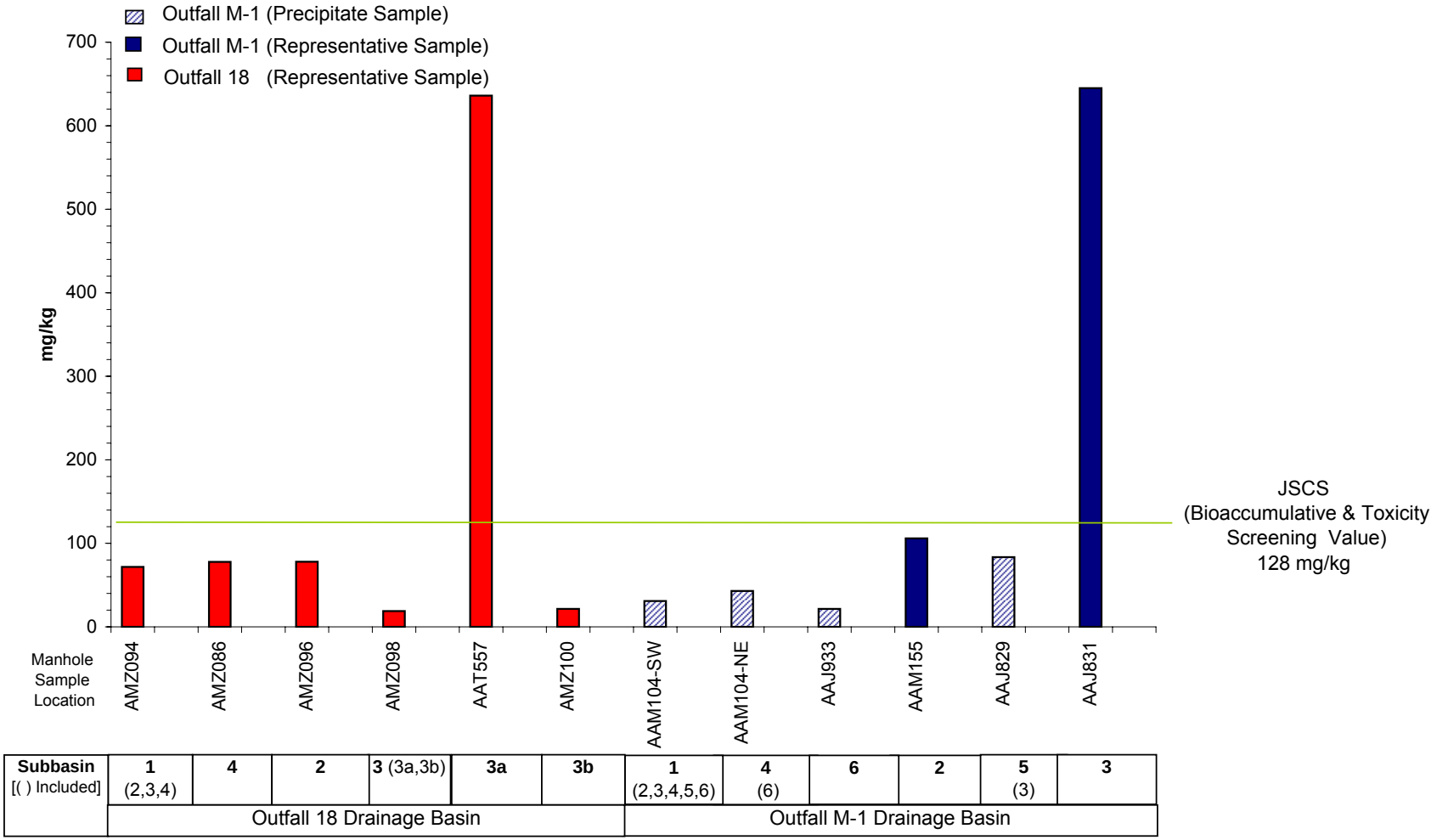


Figure 3-3 Mercury Concentrations Inline Solids

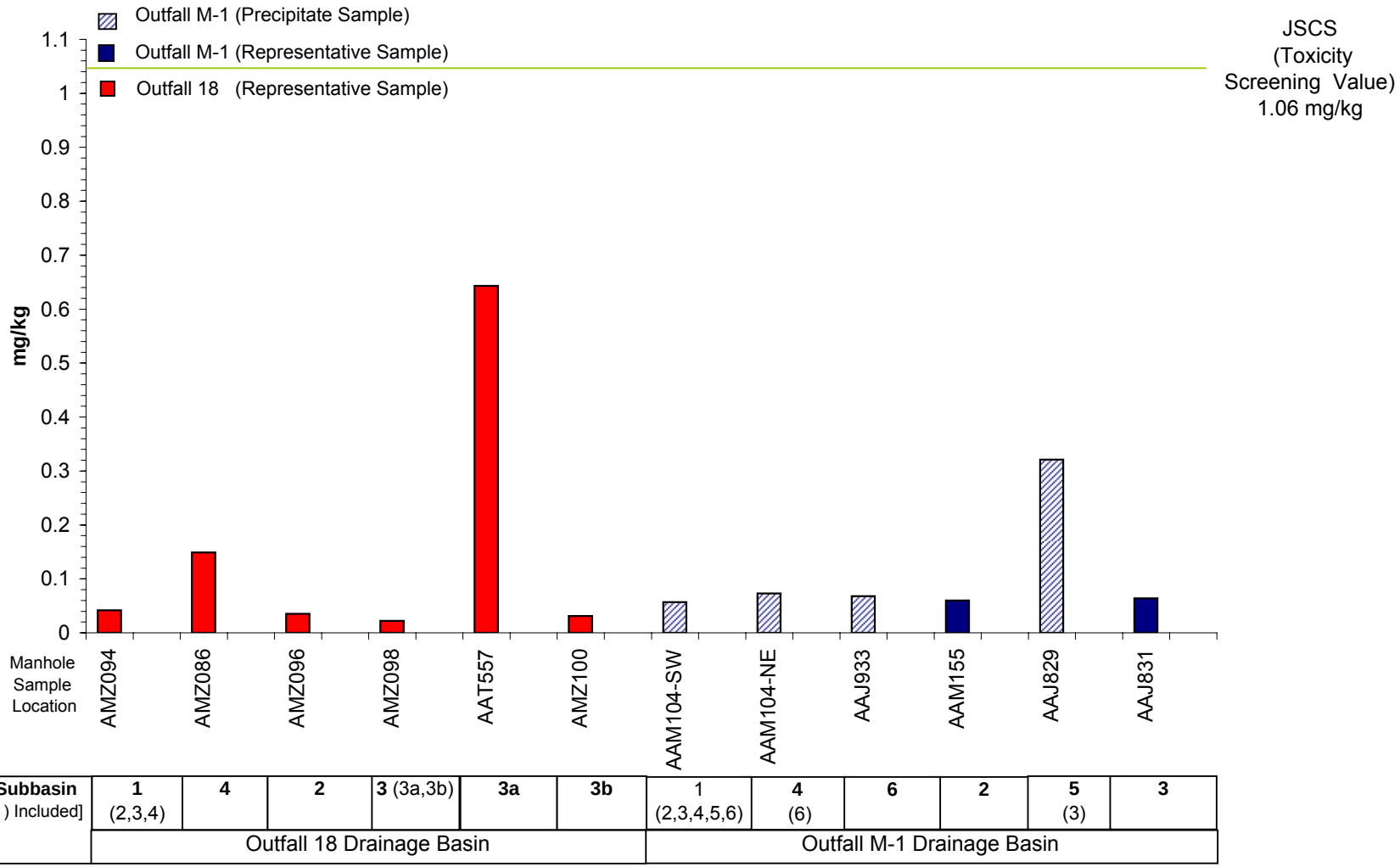


Figure 3-4 Zinc Concentrations Inline Solids

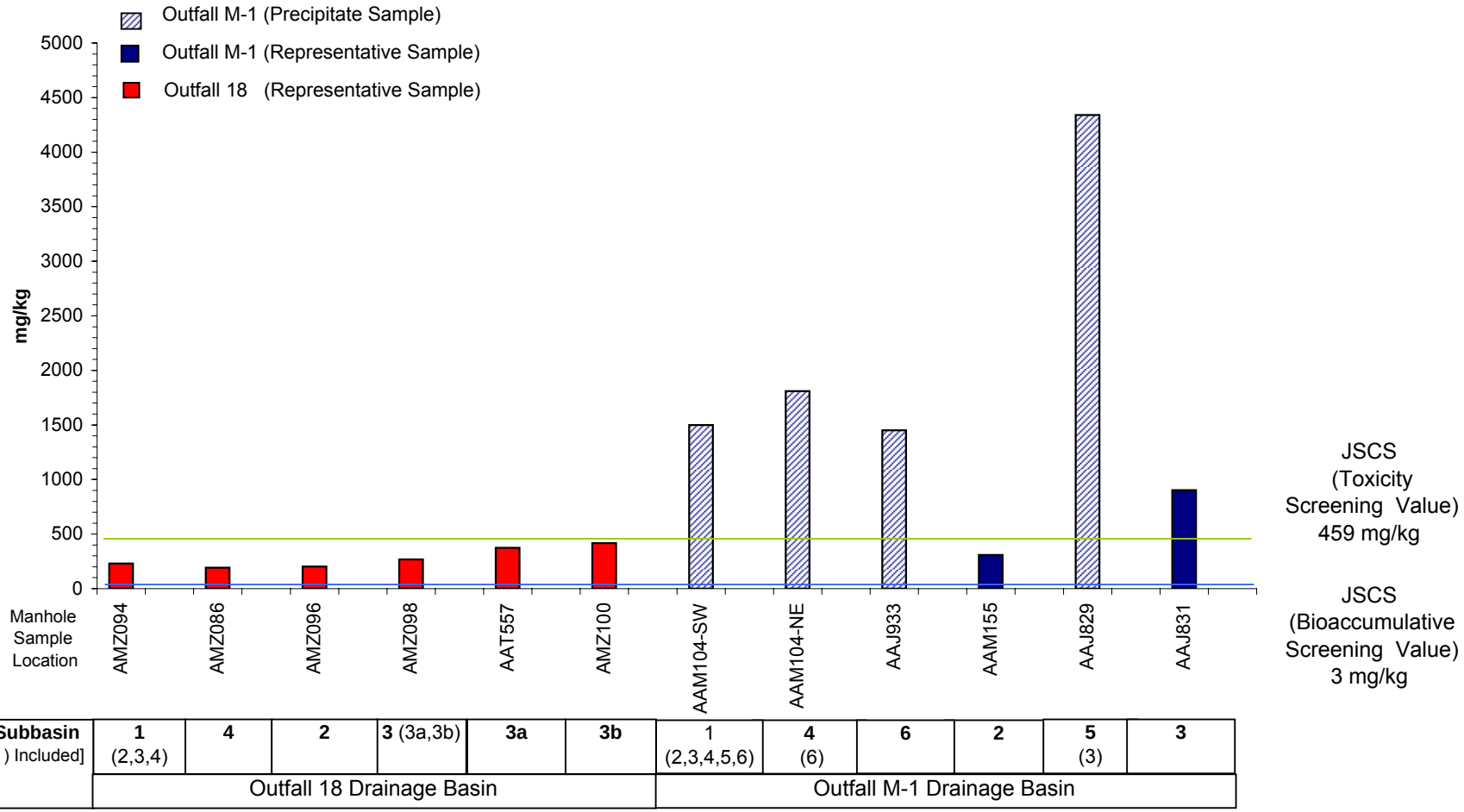


Figure 3-5 Bis(2-ethylhexyl)Phthalate Concentrations Inline Solids

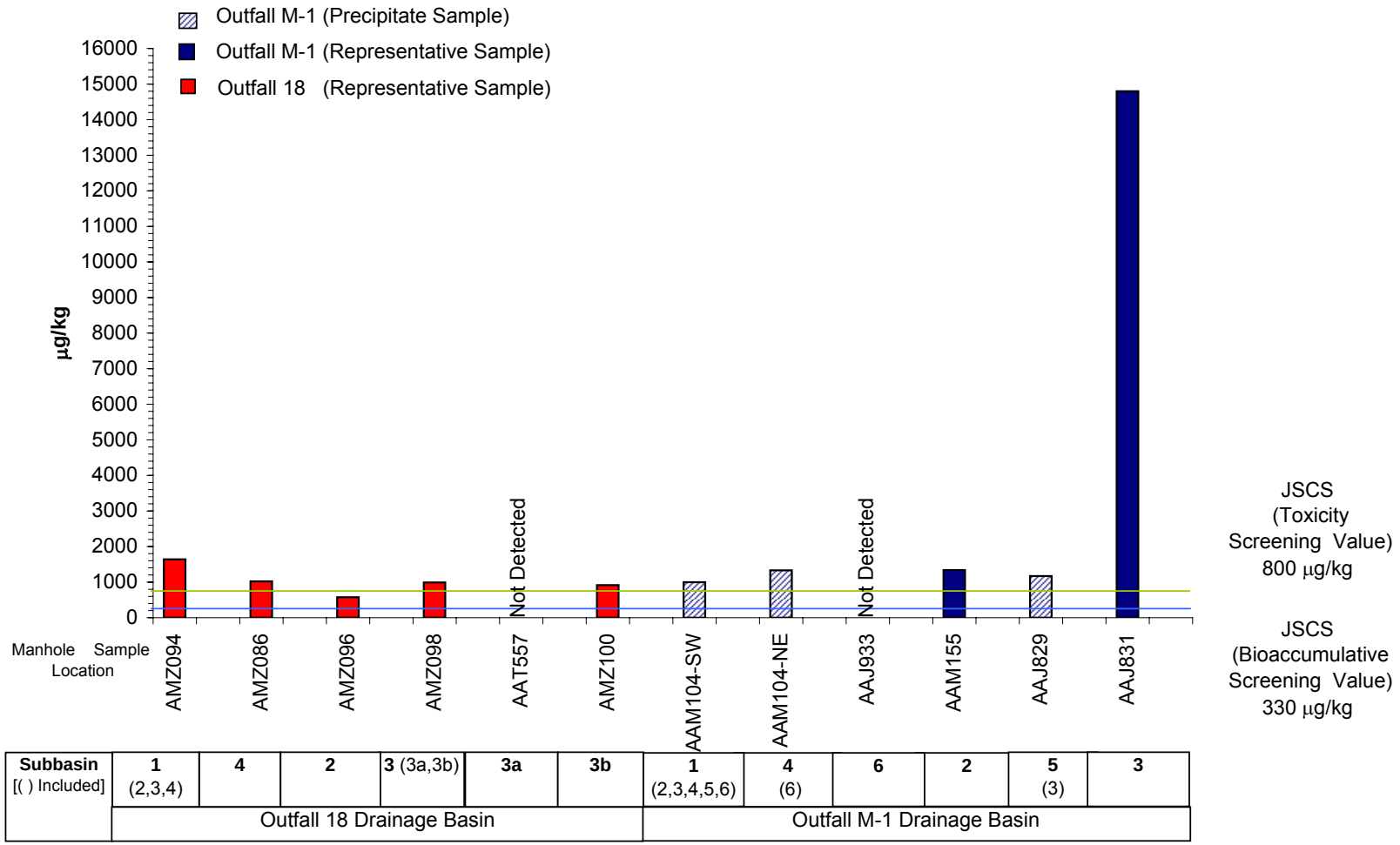


Figure 3-6 Total PCB Concentrations Inline Solids

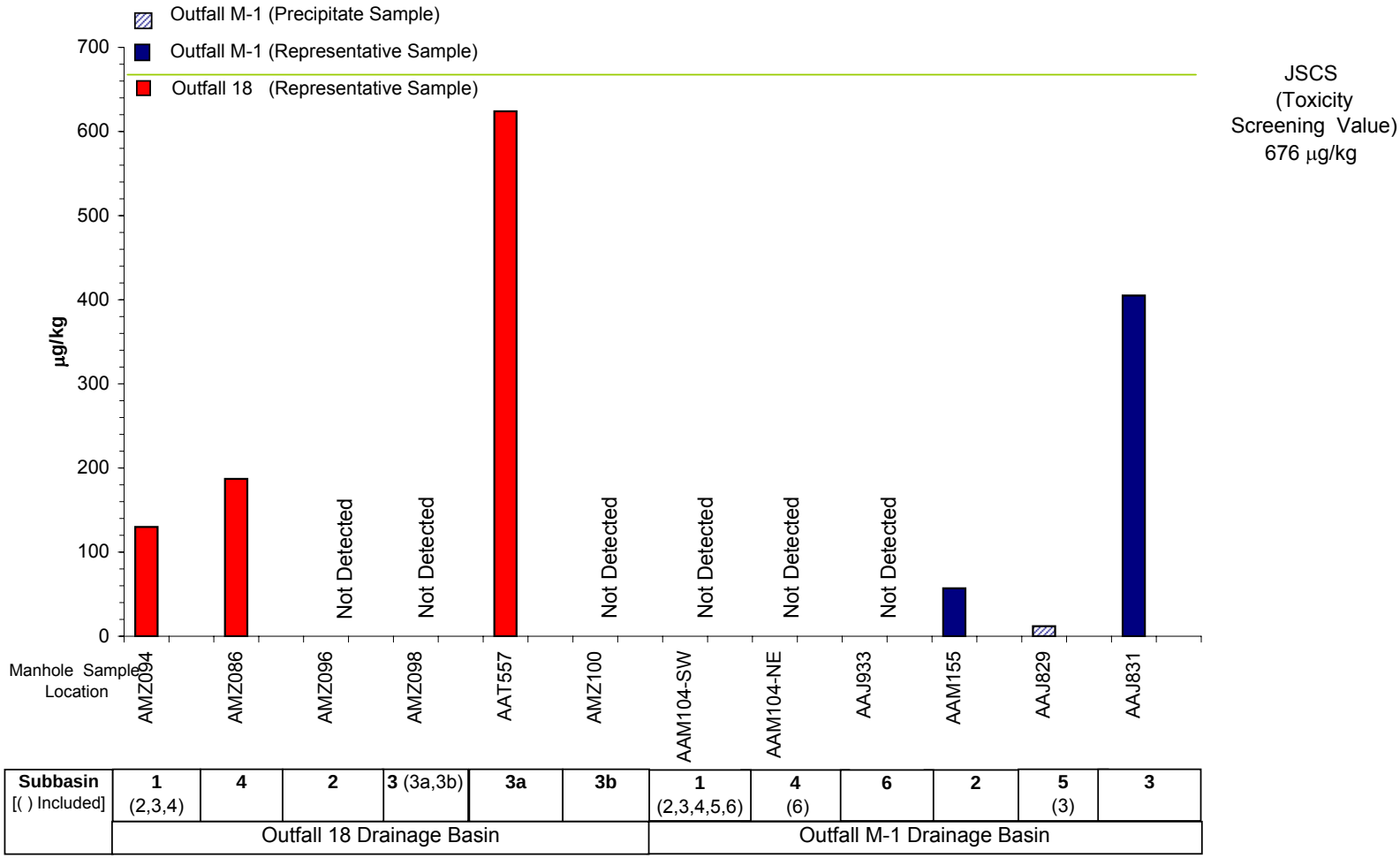


Figure 3-7 Total DDT Concentrations Inline Solids

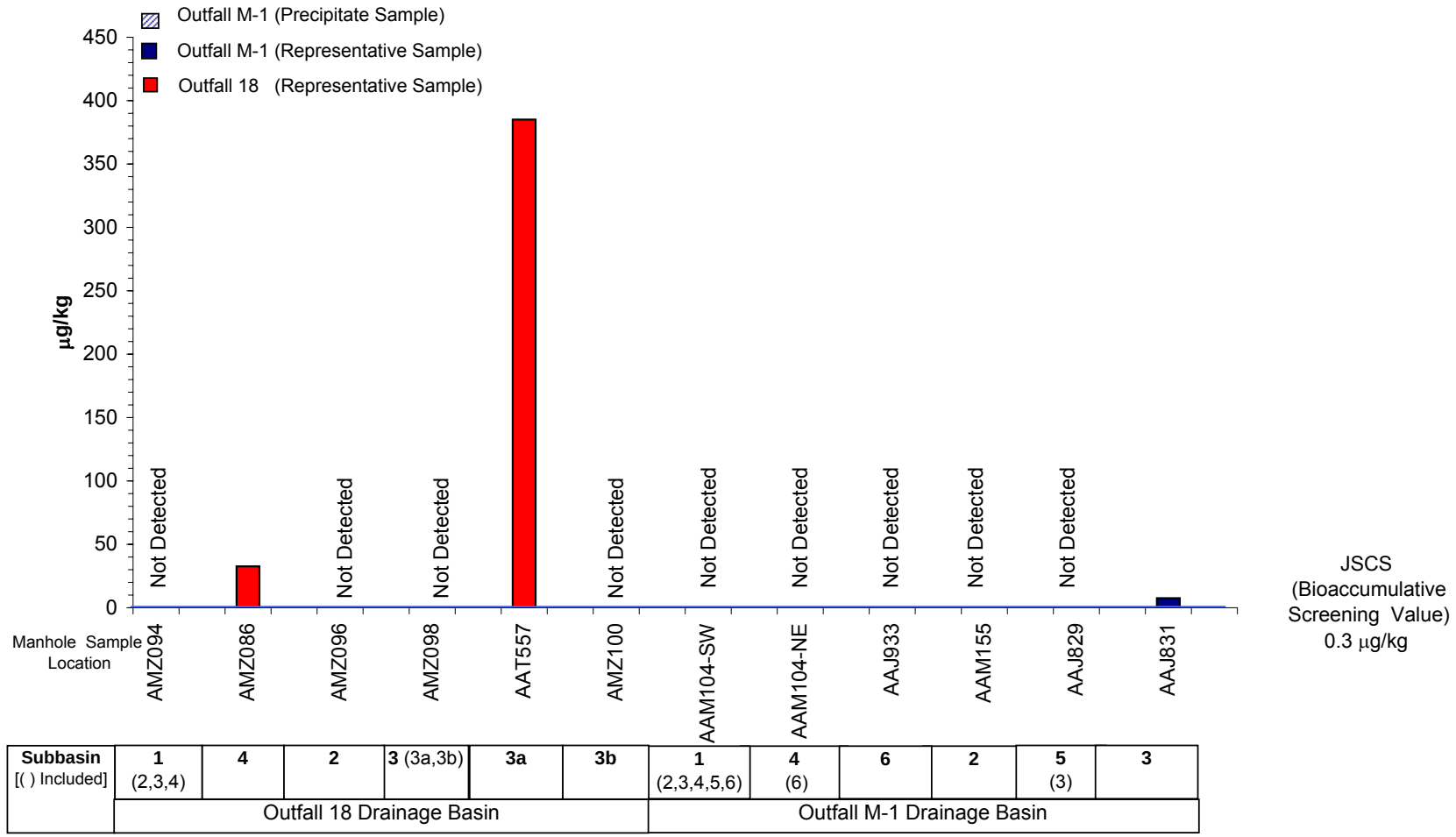


Figure 3-8 LPAH Concentrations Inline Solids

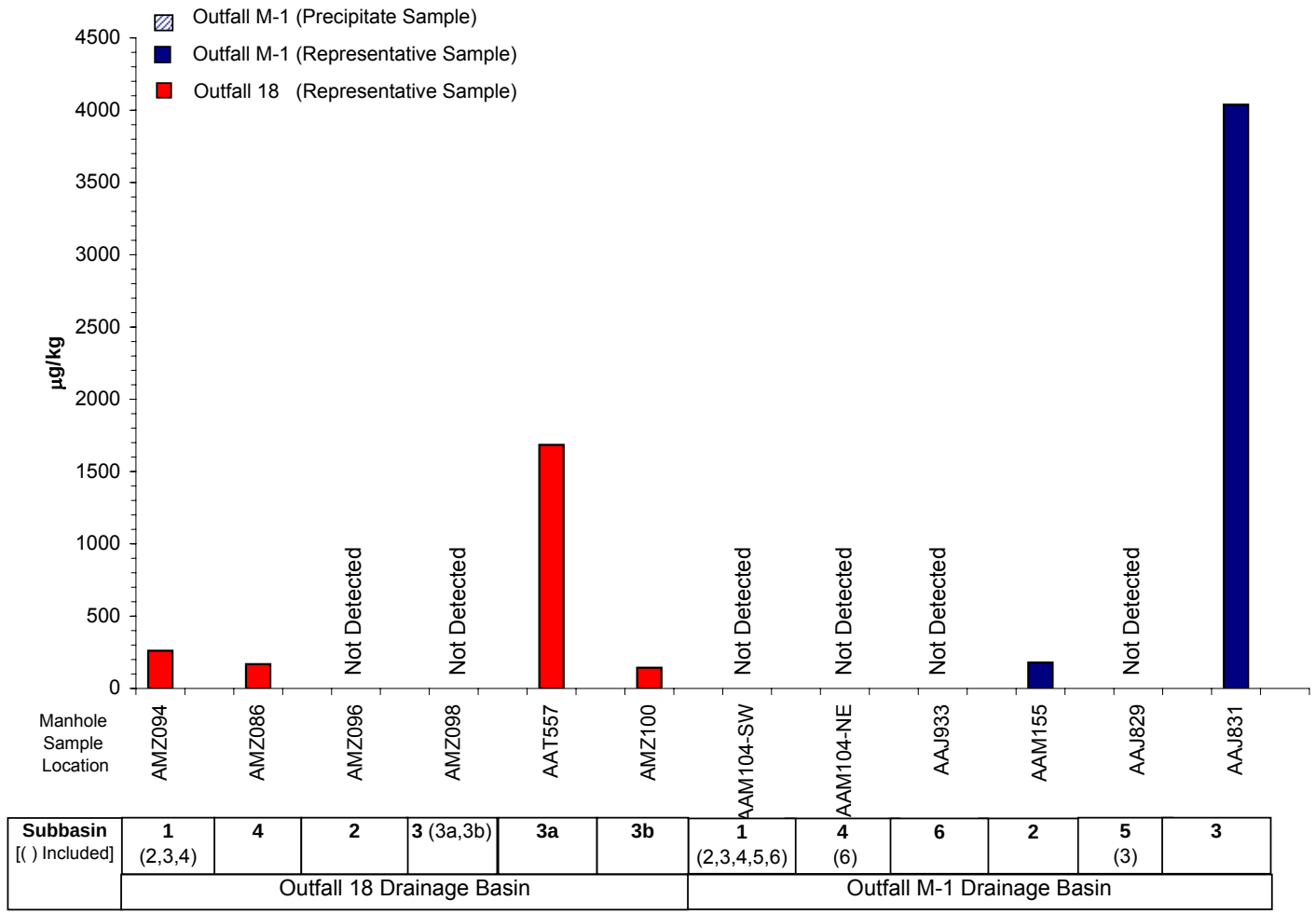
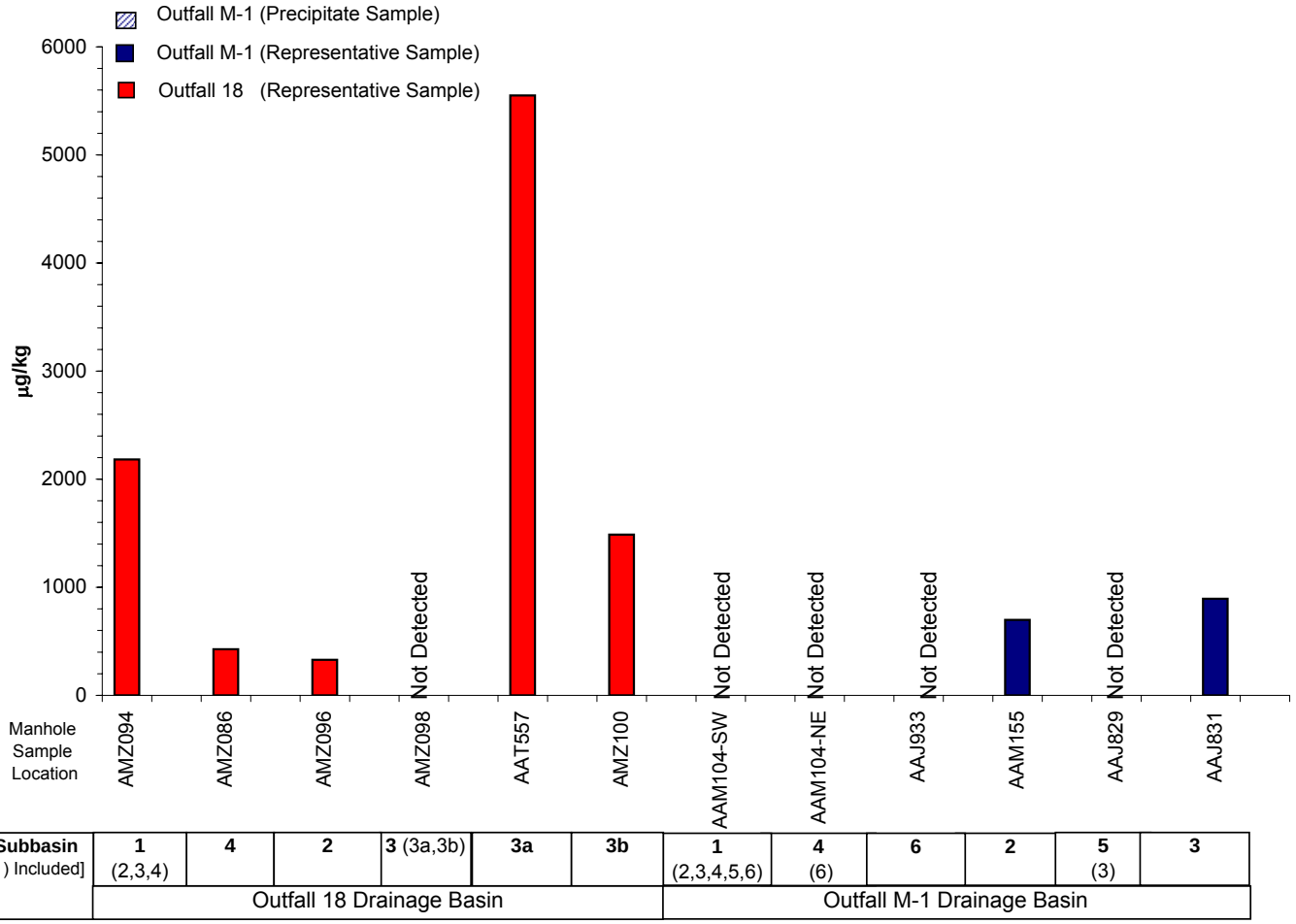


Figure 3-9 HPAH Concentrations Inline Solids



APPENDIX A
Field Data Sheets

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: 8/13/03	Time: 0940	Current Weather conditions: SUNNY, CALM, ~ 70°F
Sampling Team Present: DOUG HUTCHINSON / MIKE HAUSER		
Basin: M-1	Node: AAM155	Subbasin:
Address: 6235 N. BASIN		

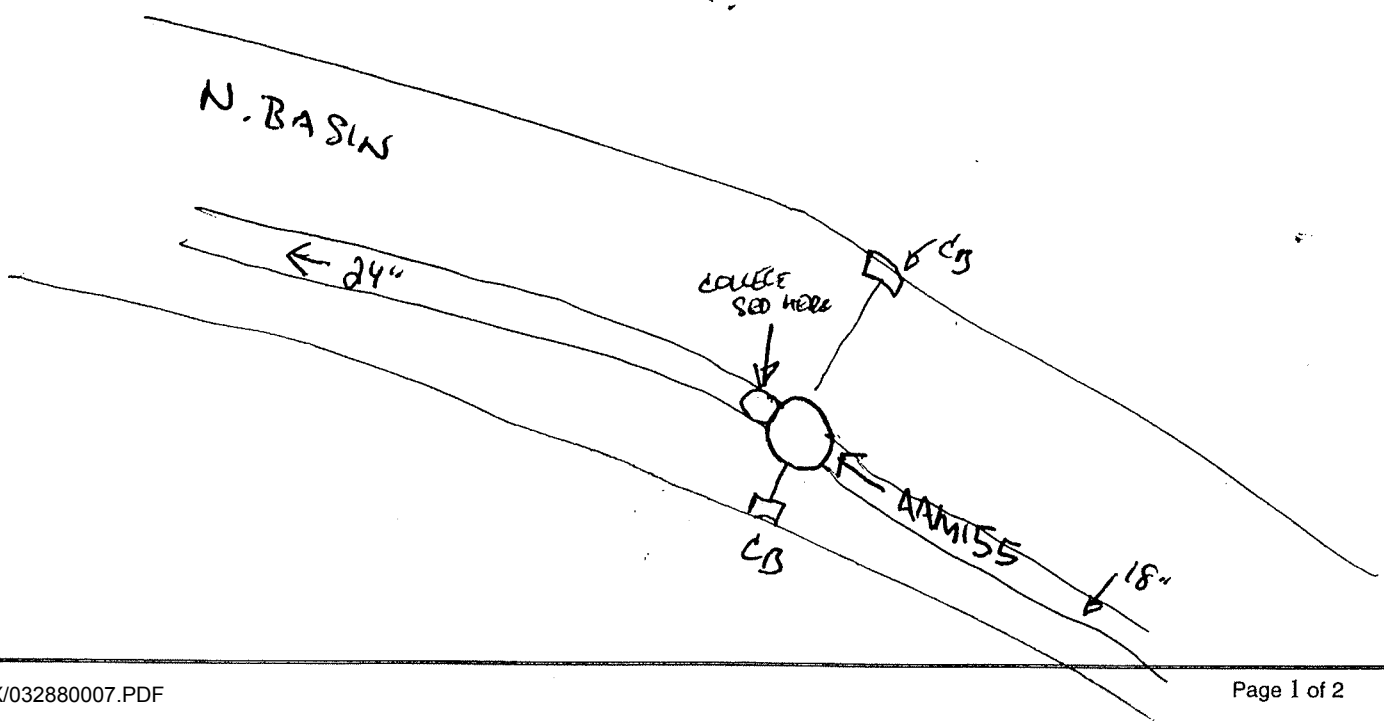
SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	IN AREA OF MH. 1.5-2.0" DEEP (AT DEGREES)
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO N/A
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 + DOWN FROM M.H.

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

18" UP / 24" DOWN

SEDIMENT AT LEAST 20' UP/DOWN FROM M.H.



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAM155

Sampling Equipment:	STAINLESS BUCKET & SPOON
Equipment Decontamination process:	PER SOP 7.01A
Sample date: 8/13/03	Sample time: 0950
Sample Identification: (IL-XX-NNNN-ddmmyy)	IL-XX-AAM155-080303
Sample location: (number of feet from node of entry)	0-18" DOWNSTREAM
Sample collection technique:	W/ S.S. SPOON
Color of sample:	BLACK
Texture/Particle size:	POORLY SORTED SANDY GRAVEL W/ COARSE GRAVEL, ROUNDED UP TO 2"
Visual or olfactory evidence of contamination:	SLIGHT HYDROCARBON ODOR SLIGHT SHEEN
Depth of solids in area where sample collected:	3½"
Amount and type of debris:	>1% SCREWS & WASHERS
Compositing notes:	REMOVED GRAVEL > 3/4" 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	
Sample delivered to lab? Y/N	Lab ID Number: FO 030813
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

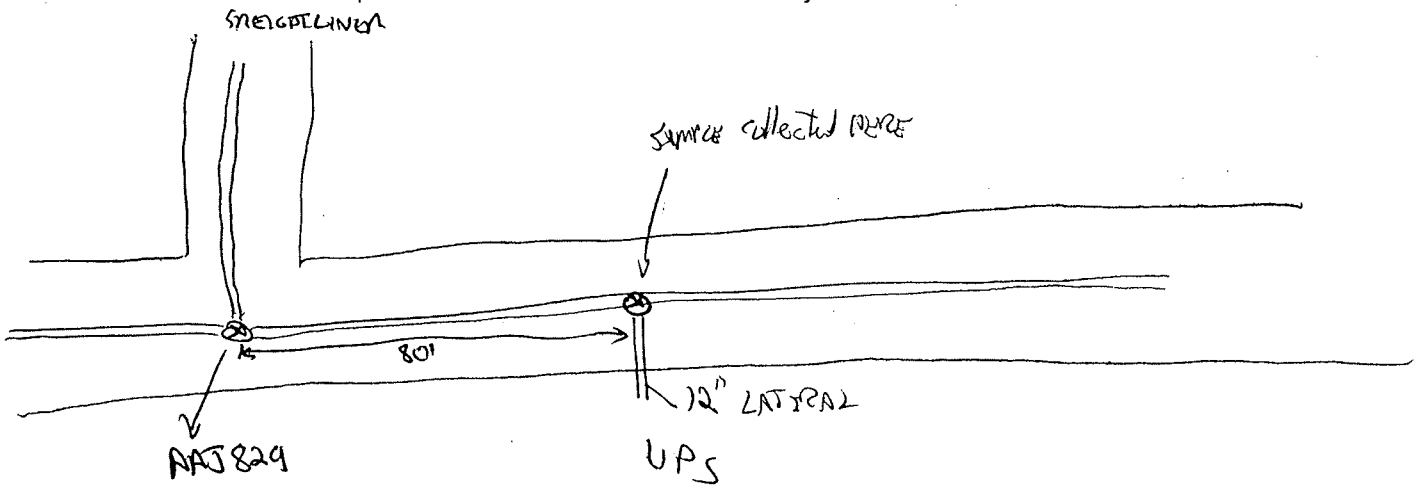
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-13-03	Time: 1127	Current Weather conditions: SUNNY 70's
Sampling Team Present: DJV | MJH		
Basin: M)	Node: AAJ 829	Subbasin:
Address: INTERSECTION OF N BASIN → FATHOM		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	Yes ½" OF FLOWING WATER COMING FROM FREIGHTLINER
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	Yes AT 80' DOWN FROM AAJ829 *
Are sample-able quantities of sediments present in the line?	YES - BROWN SEDIMENT OBSERVED WHERE LATERAL FROM SOUTH ENTERS THE LINE - PROBABLY MINERAL ACCUMULATION WHERE GW SEEPING IN
Describe lateral extent of sample-able sediments present in the line:	LIMITED TO AREA AROUND LATERAL

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



* SEDS OBSERVED BELOW LATERAL. NOT OBSERVED IN LATERAL. PRESENCE POSSIBLY DUE TO GW INFILTRATION AND PRECIPITATION OF MINERALS.

SECTION 2 - SAMPLE COLLECTION REPORT

Node: NAT 829

Sampling Equipment:	SPOON + SS BOWL
Equipment Decontamination process:	PER SOP 7.01a
Sample date: 8-13-03	Sample time: 1142
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-MJ-NAT829-0803
Sample location: (number of feet from node of entry)	80' DOWN STREAM FROM NAT 829
Sample collection technique:	SED SCOOPED INTO BOWL. HOMOGENIZED TO REMOVE SURFACE & PLACED INTO SAMPLE CONTAINERS
Color of sample:	BROWN & BLACK MOTTLED
Texture/Particle size:	FINE
Visual or olfactory evidence of contamination:	NONE
Depth of solids in area where sample collected:	UP TO 4" THICK ON WALL.
Amount and type of debris:	—
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	FO 030814
Samples delivered to lab? Y/N	Lab ID Number:
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

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Water Pollution control Laboratory
6543 N. Burlington Ave.,
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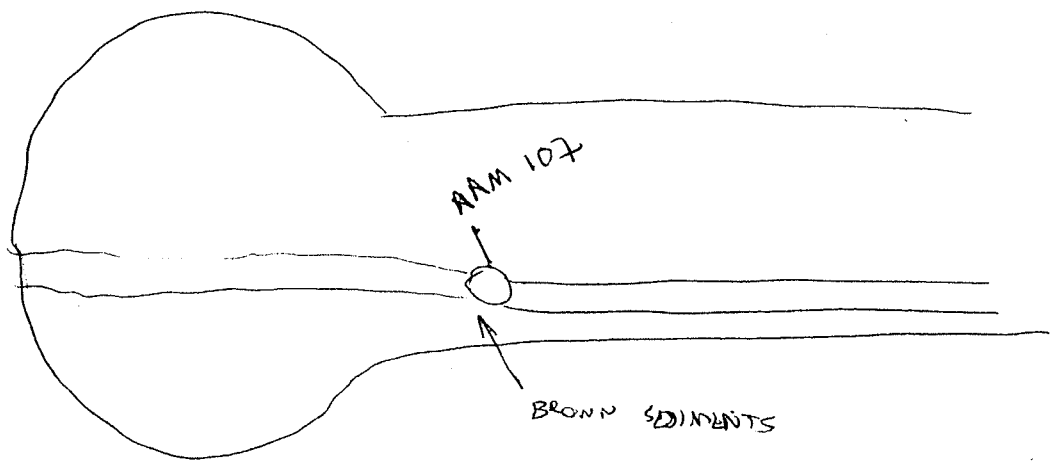
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-12-03	Time: 0911	Current Weather conditions: SUNNY 60's
Sampling Team Present: MIKE HAUSER / DOUG HUTCHINSON		
Basin: M-1	Node: AAM 107	Subbasin: M1
Address: 6208 N. ENSIGN ST		

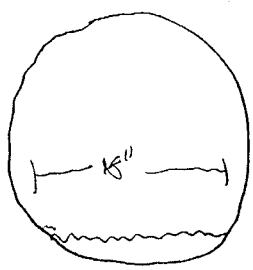
SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	½-1" FLOWING WATER IN LINE. FREIGHTLINER
Does river appear to back up to this location? Describe rate/color/odor of flow:	NOT RIGHT NOW. OUTFALL VISABLE.
Are sediments observed in the line?	MINOR BROWN SEDIMENT OBSERVED. NOT MUCH SEDS EXTEND FROM ABOVE CURRENT WATER LEVEL, TO THE INVERT.
Are sample-able quantities of sediments present in the line?	NO, DOWN DECIDED TO OMIT THIS LOCATION DUE TO NON-REPRESENTATIVE NATURE OF BROWN SED.
Describe lateral extent of sample-able sediments present in the line:	

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



CROSS SECTION.



SECTION 2 - SAMPLE COLLECTION REPORT	Node: AMM 107
Sampling Equipment:	
Equipment Decontamination process:	
Sample date:	Sample time:
Sample Identification: (IL-XX-NNNNNN-mmyy)	
Sample location: (number of feet from node of entry)	NA
Sample collection technique:	
Color of sample:	
Texture/Particle size:	
Visual or olfactory evidence of contamination:	
Depth of solids in area where sample collected:	
Amount and type of debris:	
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:			
Describe any deviations from standard procedures:				

SECTION 3 - PHOTOGRAPH LOG		
Photograph Log	In-Pipe sample location	
	Homogenized sample	

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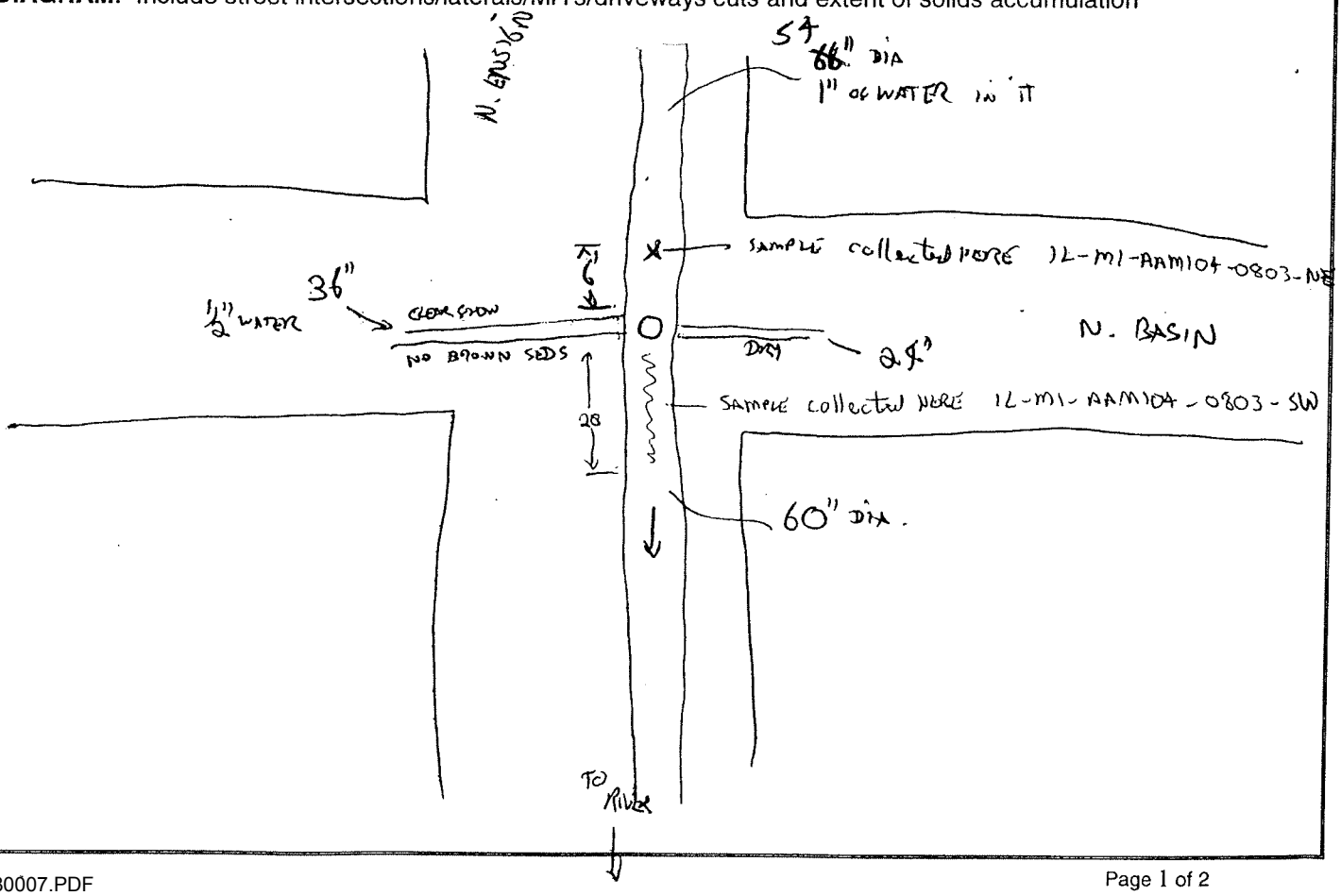
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-12-03	Time: 0952	Current Weather conditions: SUNNY 60°
Sampling Team Present: MJP / DJH		
Basin: M1	Node: AAM 104	Subbasin: 4 + 1
Address: N BASIN & N. ENSIGN		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	FLOWING WATER IN LINE
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES. ORANGE BROWN SILT.
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	MAJORITY SEDS DEPOSITED UPSTREAM OF MH, ALTHOUGH TYPE Y ARE DEPOSITED EXTENSIVELY

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAM 104

Sampling Equipment:	SS SPOONS + SS BUCKET
Equipment Decontamination process:	Per 7.01a
Sample date: 8-12-03	Sample time: 0958
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-MI-AAM104-0803 - NE
Sample location: (number of feet from node of entry)	8 FEET UPSTREAM FROM NODE
Sample collection technique:	SS SPOON USED TO COLLECT SEDIMENT FROM PIPE INTO SS. BUCKET. BUCKET RAISED TO SURFACE. SAMPLE HOMOGINIZED AND PLACED INTO SAMPLE JARS
Color of sample:	BACK TO ORANGE
Texture/Particle size:	VERY FINE, HOWEVER LARGE ACCRETIONS OF HARDENED SEDIMENT ARE PRESENT
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	3/4"
Amount and type of debris:	NO
Compositing notes:	REMOVED SEVERAL OF THE LARGE ACCRETIONS OF HARDENED SEDIMENT

Sample Jars Collected

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

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 030809
Describe any deviations from standard procedures:	NO

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	V
	Homogenized sample	V

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LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-12-03	Time: 1048	Current Weather conditions: SUNNY 60's
Sampling Team Present: MJW / DJH		
Basin: M1	Node: AAM 104	Subbasin: 4+1
Address: N BASIN + N. ENSIGN		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	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:	DOWNSTREAM AT LEAST 20'

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

SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAM 104

Sampling Equipment:	SS SPOONS + SS Bowl
Equipment Decontamination process:	Per SOP 7.01a
Sample date: 8-12-03	Sample time: 1054
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-MI-AAM104-0803-SW
Sample location: (number of feet from node of entry)	FROM 0 TO 20' DOWNSTREAM OF NODE.
Sample collection technique:	SS SPOON INTO SS BUCKET. BUCKET RAISED TO SURFACE. SAMPLE HOMOGENIZED AND PUT INTO SAMPLE JARS
Color of sample:	BROWN
Texture/Particle size:	CLAY
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1"
Amount and type of debris:	NONE
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 030810
Describe any deviations from standard procedures:	— DOWN STREAM SAMPLE NOT ORIGINALLY

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	✓
	Homogenized sample	✓

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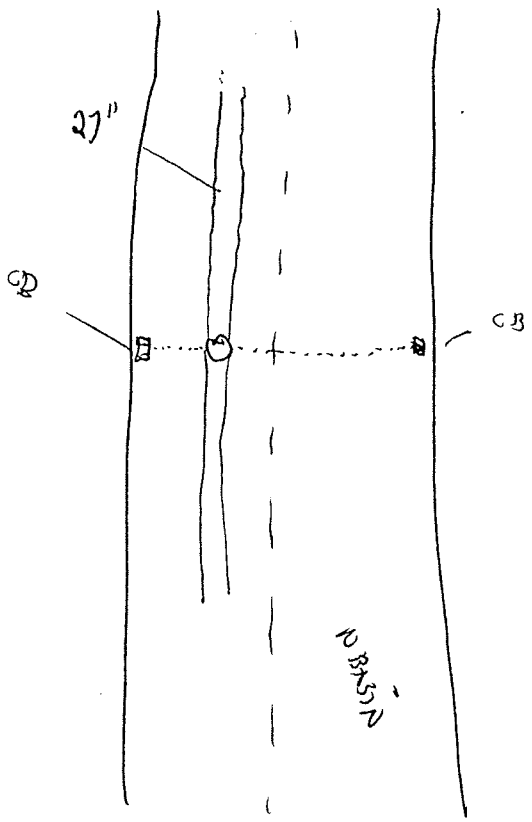
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-12-03	Time: 1120	Current Weather conditions: SUNNY 70's
Sampling Team Present: MSP/ DSH		
Basin: M1	Node: PAM105	Subbasin: 2
Address: 6335 N BASIN		

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?	NO - LINE IS CLEAN
Are sample-able quantities of sediments present in the line?	NO
Describe lateral extent of sample-able sediments present in the line:	—

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



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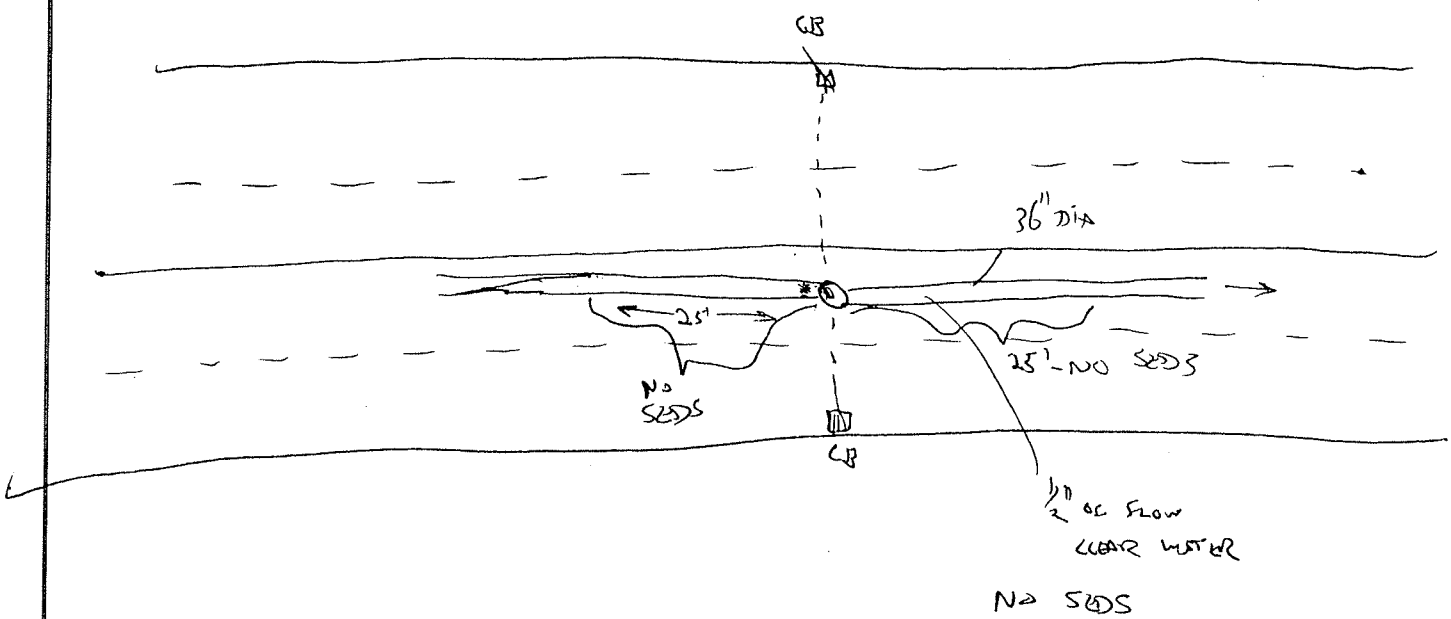
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-12-03	Time: 1157	Current Weather conditions: SUNNY 70's.
Sampling Team Present: MJH / DJH		
Basin: M1	Node: ~~AAJ820~~	Subbasin:
Address: 6707 N BASIN AVE		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	UPSTREAM - A SMALL DAM IS CAUSING A POOL. NO SEDIMENT IN POOL. DOWN STREAM - ½" OF FLOW - VERY CLEAR
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	NO AT LEAST DOWN 25' AND AT LEAST 25' UP
Are sample-able quantities of sediments present in the line?	NO
Describe lateral extent of sample-able sediments present in the line:	NONE

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



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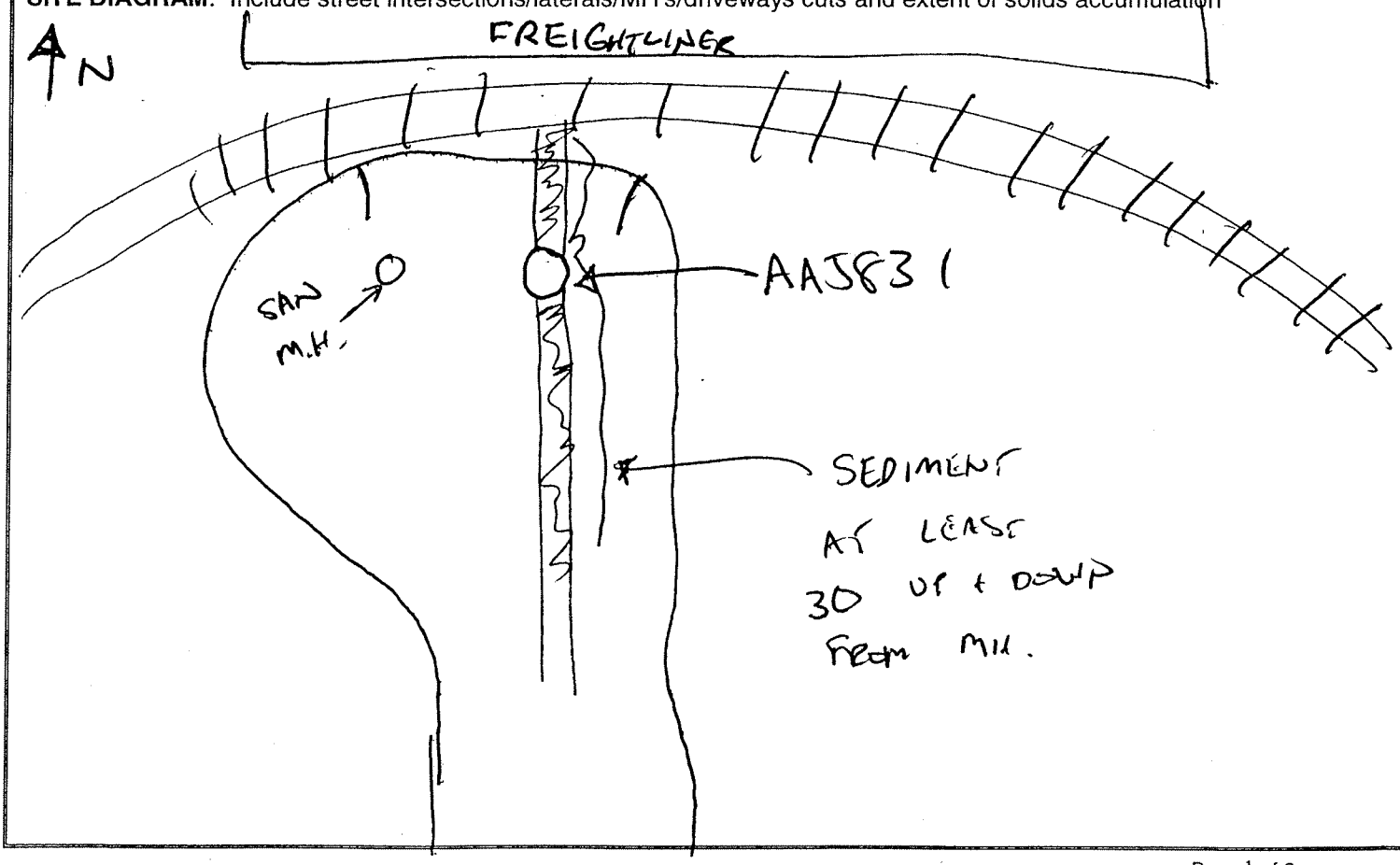
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8/12/03	Time: 1320	Current Weather conditions: SUNNY, 75°F 5 MPH WIND
Sampling Team Present: DOUG HUTCHINSON / MIKE HAUSER		
Basin: M1	Node: AAJ831	Subbasin: 3
Address: 6936 N. FATHOM		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	0.8" H_2O
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO PETROLEUM-LIKE ODOR / SLIGHT SHEEN
Are sediments observed in the line?	YES, ~6" DEEP
Are sample-able quantities of sediments present in the line?	YES, 6"
Describe lateral extent of sample-able sediments present in the line:	"AS FAR AS CAN SEE" = AT LEAST 30' UP & DOWN FROM NODE

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAS831

Sampling Equipment:	S.S. BUCKET + SS. BOWL
Equipment Decontamination process:	PER SOP 7.01A
Sample date: 8/12/03	Sample time: 1345
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-M1-AAS831-0803
Sample location: (number of feet from node of entry)	Ø IN MH CHAMBER
Sample collection technique:	S.S. SPOON
Color of sample:	BLACK W/ COLORED PAINT CHIPS
Texture/Particle size:	MOSTLY F. SAND (WELL-GRADED) W/ SOME PAINT CHIPS + SCRE
Visual or olfactory evidence of contamination:	YES, PETROLEUM LIKE ODOR, SLIGHT SHEEN
Depth of solids in area where sample collected:	6"
Amount and type of debris:	SCREWS, BOLTS, PAINT CHIPS, ECC. GRAVEL
Compositing notes:	COLLECTED DUPE HERE

Sample Jars Collected 6 SAMPLE / 6 DUPE

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

Duplicate sample collected?	YES
Duplicate sample fictitious identification # on COC:	IL-M1-XXY101-0803 ← FO 030815
Samples placed in chilled cooler? (Y)N	
Samples delivered to lab? (Y)N	Lab ID Number: FO 030811
Describe any deviations from standard procedures:	NONE

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	YES
	Homogenized sample	YES

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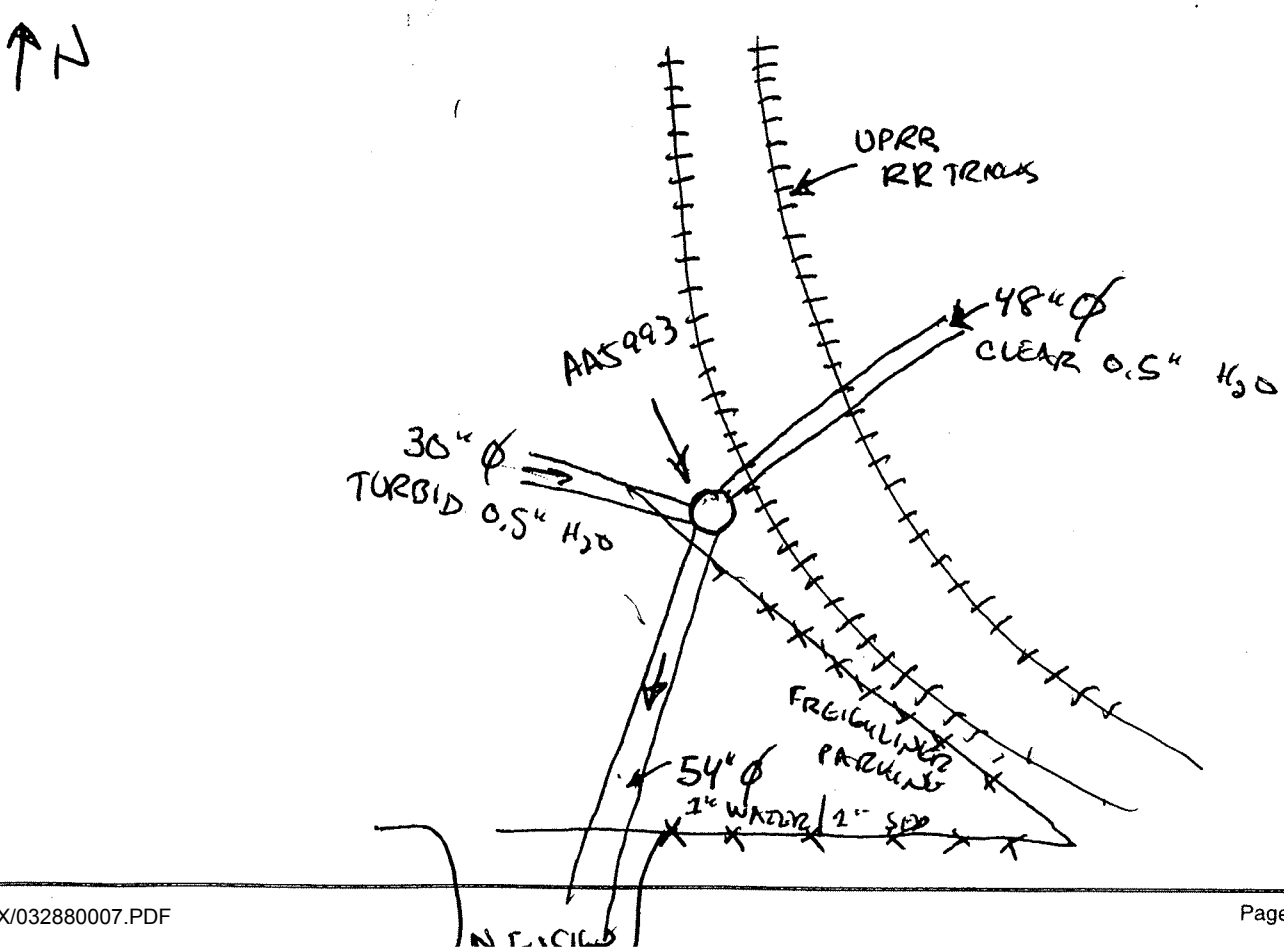
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8/12/03	Time: 1410	Current Weather conditions: SUNNY, ~75°, CALM
Sampling Team Present: DOUG HUTCHINSON / JWK		
Basin: M-1	Node: AAS ~~993~~ 933	Subbasin: 1
Address: N. ENSIGN + UPRR		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	48" IN FROM EAST = 0.5" CLEAR FLOW 30" IN FROM NW = 0.5" GRAY TURBID FLOW
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO N/A
Are sediments observed in the line?	YES = 1" IN 54" OUTLET, NONE IN 30" LATERAL 48" = FILM ONLY W/ CRUSTS ABOVE WATER
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	1" IN 54", NONE IN 30" LATERAL 48" = FILM ONLY UNDER WATER W/ CRUST ABOVE

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



AH 933

SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAS 993

Sampling Equipment:	S.S. BUCKET + SPOON
Equipment Decontamination process:	PER SOP 7.01 A
Sample date: 8/12/03	Sample time: 1440
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-MW-AAJ993-0803
Sample location: (number of feet from node of entry)	0-10 DOWN
Sample collection technique:	S.S. SPOON
Color of sample:	ORANGE - BROWN
Texture/Particle size:	SILT SIZED + SMALLER FILM LIKE SEDIMENT
Visual or olfactory evidence of contamination:	NONE
Depth of solids in area where sample collected:	1" TO FILM (NODE TO 10' DOWN)
Amount and type of debris:	ONLY DRIED FILM CRUST (NONE)
Compositing notes:	USED ALL MATERIAL

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 030812
Describe any deviations from standard procedures:	NONE

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	✓
	Homogenized sample	✓

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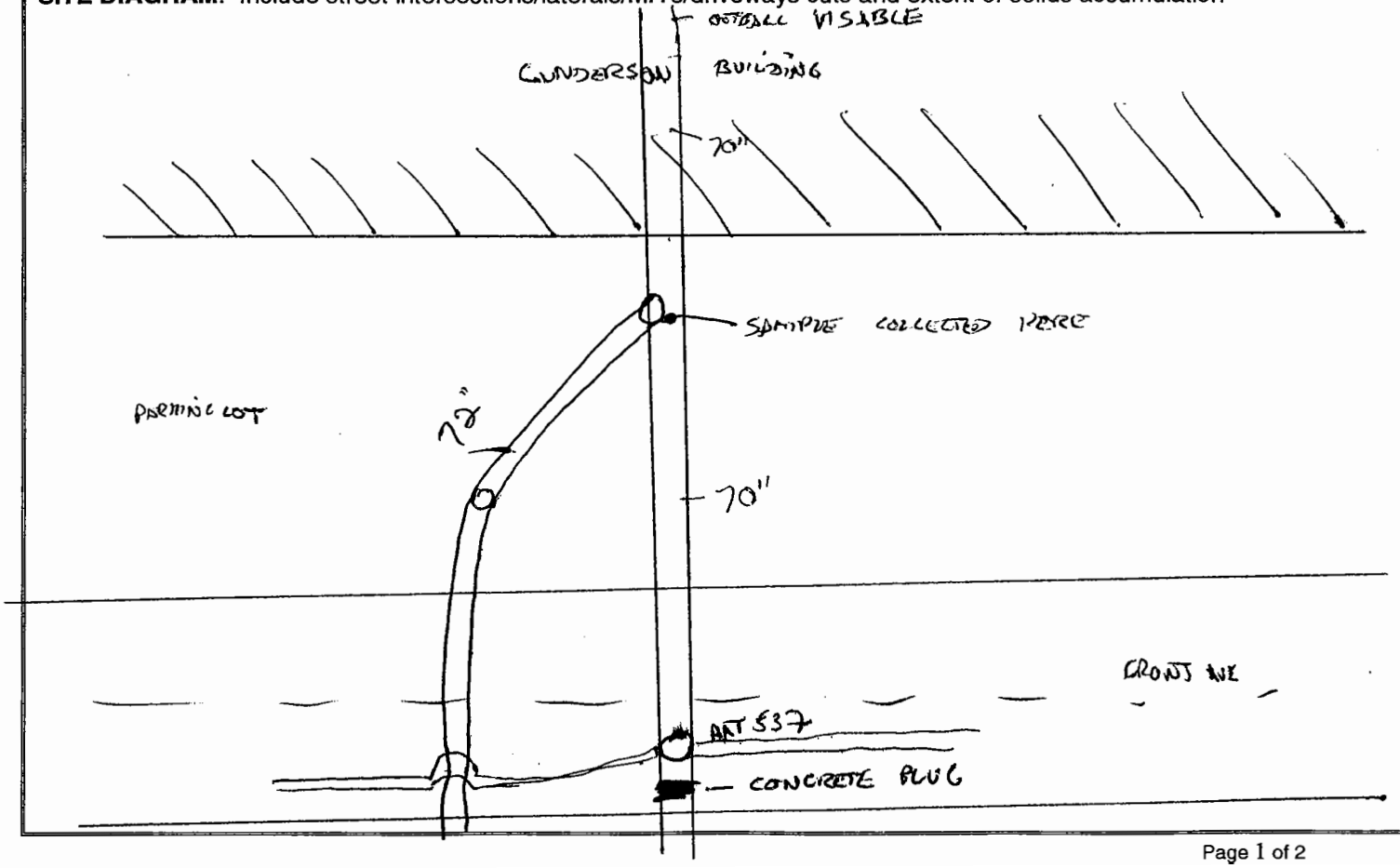
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-20-03	Time: 1930	Current Weather conditions: SUNNY 70'S
Sampling Team Present: MJH/MAC) JJM/ AC		
Basin: 18	Node: AAT537 (AAT537)	Subbasin:
Address: CUNDERSON		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	2" OF CLEAR FLOW COMING DOWN 72" PIPE.
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO.
Are sediments observed in the line?	YES. AT JOIN OF 70 + 72" LINES
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	SEDS OBSERVED JUST AT THE JOIN. ALL LINES ARE CLEAN

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT 537

Sampling Equipment:	STAINLESS STEEL SPOON + BOWL
Equipment Decontamination process:	PER SOP 7.01a
Sample date: 8-20-03	Sample time: 19:45
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-AAT537-0803
Sample location: (number of feet from node of entry)	AT NODE OF ENTRY - CONFLUENCE OF 72" PIPE AND 70' PIPE
Sample collection technique:	SEDIMENT SPOONED INTO BUCKET. BUCKET BROUGHT TO SURFACE SAMPLE HOMOGINIZED AND PUT INTO LAB SUPPLIED CONTAINERS
Color of sample:	BLACK
Texture/Particle size:	SAND
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1"
Amount and type of debris:	—
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	
Samples delivered to lab? (Y)/N	Lab ID Number: FO 030838
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

City of Portland
Environmental Services

DAILY FIELD REPORT

Project LOWER HARBOR OUTFALL SED SAMPLING | Project No. 1020.001
Location BASIN 18 | Date 8-20-03
Subject FIELD NOTES | By MJH

18:00 LEAVE UPCL
1830 MEET DAVE LACEY AT KITTRIDGE BRIDGE + PROCEED TO SAMPLING SITE
1900 SET UP TRAFFIC CONTROL + LANE CLOSURE TO GAIN ACCESS TO ENTRY NODE.
1920 GO DOWN MH 537. I OBSERVE A LARGE 70" PIPE - DRY. SOME BROWN STAINED AREAS FROM GW SEEP. THE PIPE HAS BEEN COMPLETELY CEMENTED SHUT UPSTREAM OF NODE. THE ENTIRE 70" PIPE IS BLOCKED.
GO DOWN STREAM AS FAR AS POSSIBLE. MINOR SEDS. PIPE is DRY. THERE ARE TWO LATERALS COMING INTO THIS NODE PARALLEL TO FRONT AVE.
DAL DISCOVERS MH DOWN STREAM. DECIDE TO TAKE A LOOK DOWN THAT.
1940 NO NODE NUMBER FOR THIS DOWN STREAM MH. IT IS IN THE LUNDGREN P-LOT.
LABEL NODE: IT IS THE CONTINUATION OF THE 70" PIPE. LOOK DOWN STREAM AND ~~OUT~~ IF I CAN SEE THE OUTFALL DAYLIGHT AT THIS NODE THERE IS A 72" PIPE COMING IN FROM THE SIDE. THERE 3" OF GW FLOW IN IT. SEDIMENTS OBSERVED AT CONFLUENCE. NO SEDIMENTS OBSERVED ANY WHERE ELSE.
SAMPLED 'EM. SEE FDS FOR DETAILS

Attachments

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

LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

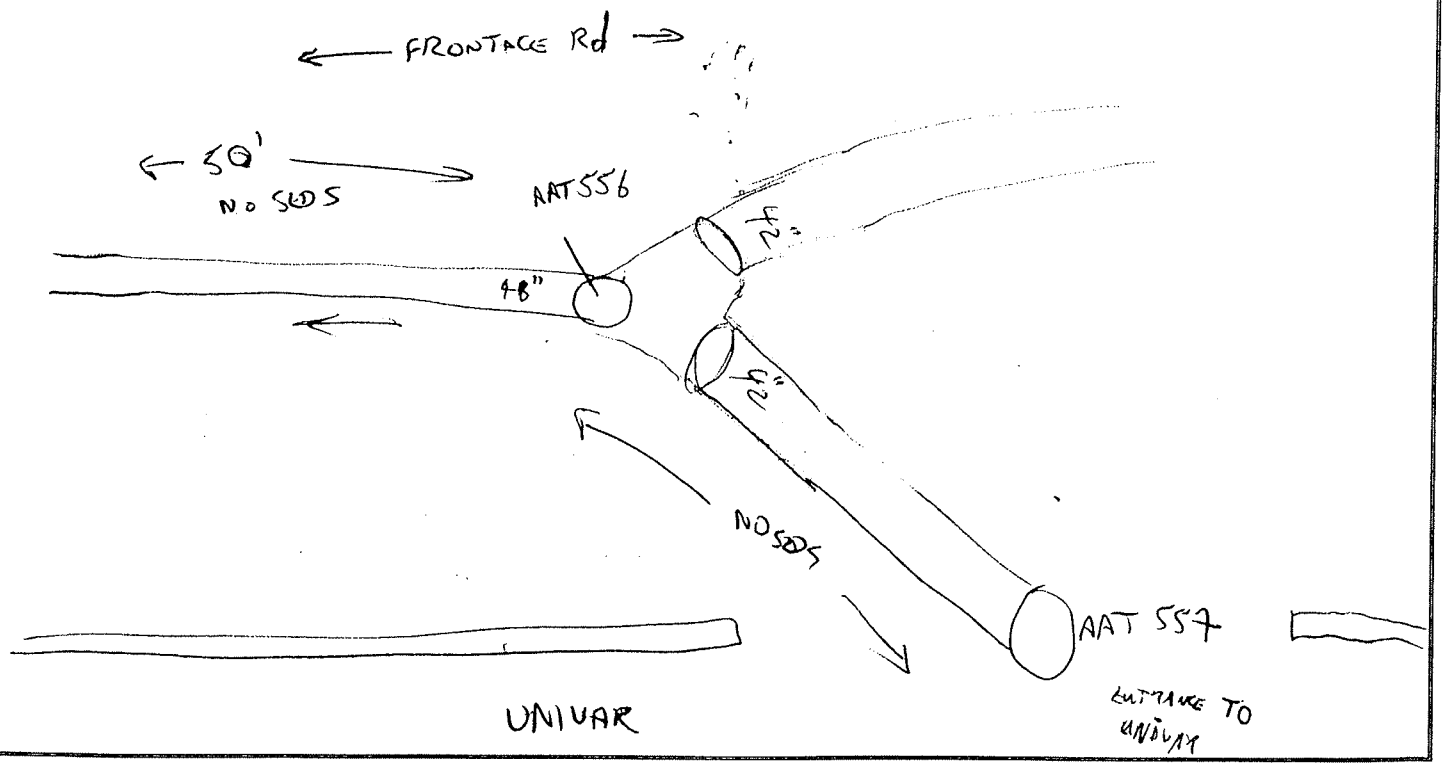
Date: 8-19-03	Time: 0927	Current Weather conditions: PARTIALLY CLOUDY
Sampling Team Present: MJW | DAC | MKS		
Basin: 18	Node: AAT 556	Subbasin: 3 (T-1 area)
Address: 3950 NW YEON.		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	Yes 3" OF FLOWING WATER AT AA
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?	NO - MINOR SILTS THAT MIX W/ WATER
Describe lateral extent of sample-able sediments present in the line:	N/A

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

THIS MAPING DIAGRAM DOES NOT MATCH OUR MAPS. WE OBSERVED AAT556 DIRECTLY CONNECTED TO AAT557.



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT 557

Sampling Equipment:	
Equipment Decontamination process:	
Sample date:	Sample time:
Sample Identification: (IL-XX-NNNNNN-mmyy)	
Sample location: (number of feet from node of entry)	
Sample collection technique:	
Color of sample:	
Texture/Particle size:	
Visual or olfactory evidence of contamination:	
Depth of solids in area where sample collected:	
Amount and type of debris:	
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:
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

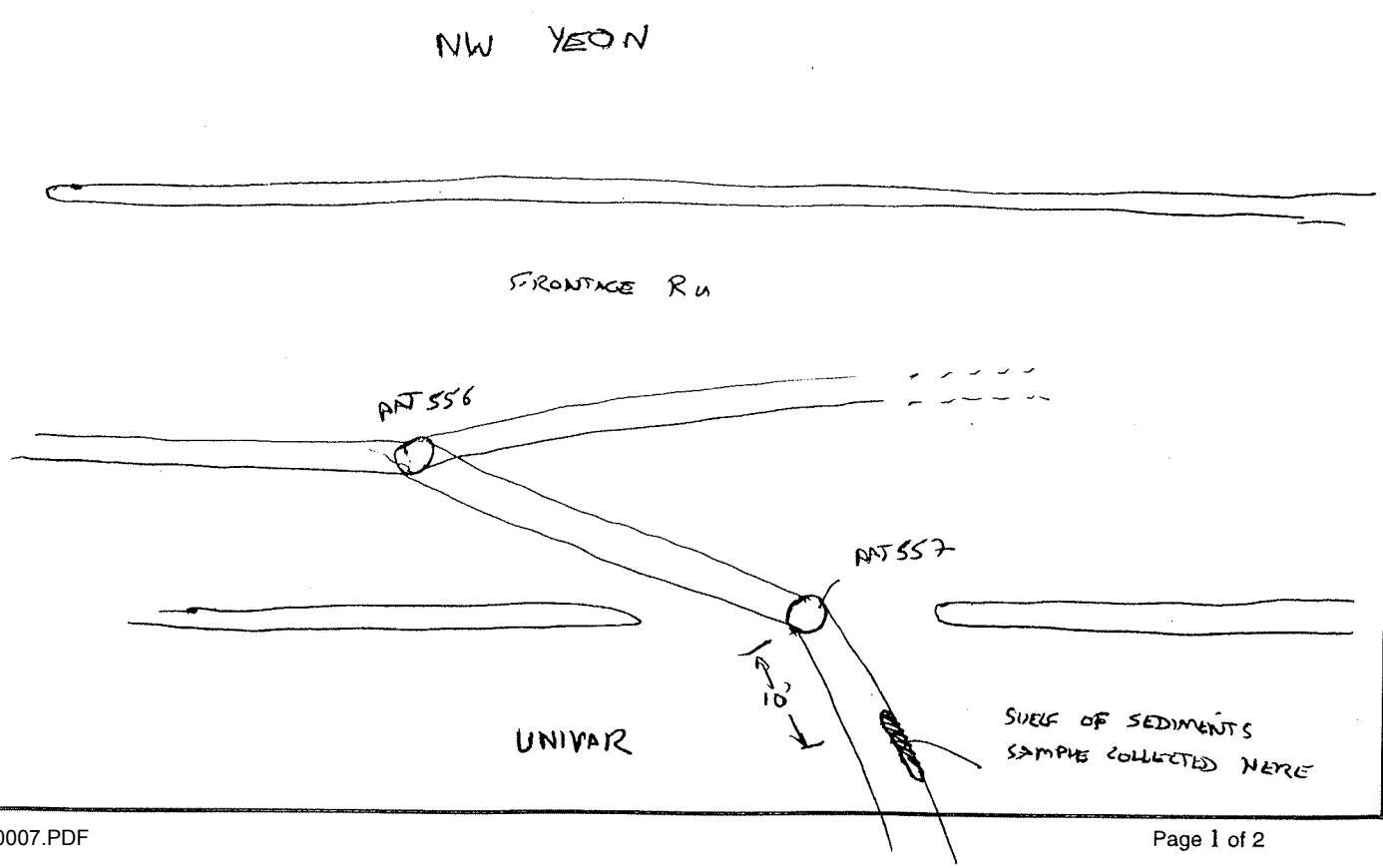
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-19-03	Time: 1010	Current Weather conditions: SUNNY 70's
Sampling Team Present: MJH/MKS/DAC		
Basin: 18	Node: AAT 557	Subbasin: 3
Address: 3950 NW YEON		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	2" 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:	A SHELF OF SEDIMENT WAS OBSERVED 10' UP FROM AAT557 SHELF LOCATED ON SIDE OF PIPE 3' LATERAL EXTENT

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT557

Sampling Equipment:	SS SPOON + SS BOWL
Equipment Decontamination process:	PER SOP 701a
Sample date: 8-19-03	Sample time: 1020
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-AAT557-0803
Sample location: (number of feet from node of entry)	SEDIMENT SPELF OBSERVED 10' UP FROM NODE ON SIDE OF PIPE.
Sample collection technique:	A 18" x 9" CHUNK WAS BROKEN OFF AND BROUGHT TO SURFACE AFTER OBSERVATION. CHUNK WAS HOMOGINIZED IN SS BOWL AND PLACED IN LAB SUPPLIED SAMPLE JARS.
Color of sample:	GREY
Texture/Particle size:	FINE CLAY
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	6" SAMPLE FOUND ON SIDE OF PIPE NO SEDS AT INVERT
Amount and type of debris:	—
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	2	
	PCBs	One 4oz glass jar	3	
	TPH (two jars)	Two 4oz glass jars	4	
	TOC	One 4oz glass jar	6	

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 030833
Describe any deviations from standard procedures:	SAMPLE WAS A SOLID CHUNK FOUND ON SIDE OF PIPE

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

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ENVIRONMENTAL SERVICES

Water Pollution control Laboratory
6543 N. Burlington Ave.,
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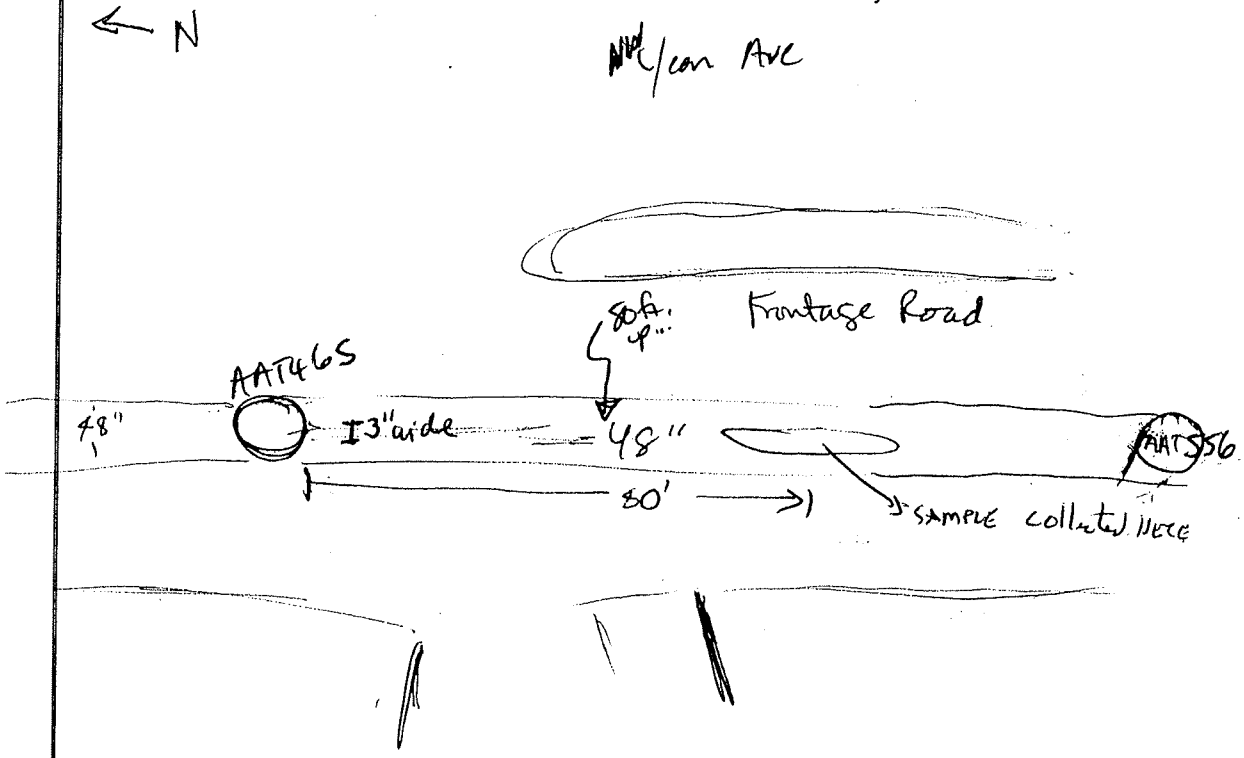
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8/19/03	Time: 1056	Current Weather conditions: Sunny, 70's
Sampling Team Present: MJH / MKS / PAC		
Basin: OF 18	Node: AAT ~~479~~ MKS 465	Subbasin: UNK. NOT LISTED IN SAP.
Address: 4033 NW Yeon		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	~1" 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?	Upstream; up about 80', thin sand layer about 1/2-1" deep
Are sample-able quantities of sediments present in the line?	YES ⇒ 1/2 - 1" deep
Describe lateral extent of sample-able sediments present in the line:	50 - 80 ft upstream of MH

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT465

Sampling Equipment:	Stainless steel bucket & spoon
Equipment Decontamination process:	See SOP 7.01a
Sample date: 8-14-03	Sample time: 1136
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-AAT465-0803
Sample location: (number of feet from node of entry)	60-80 ft. upstream
Sample collection technique:	SS SPOON & SS BUCKET. SAMPLE HOMOGENIZED AT SURFACE AND PUT IN LABS SUPPLIED JARS
Color of sample:	Black
Texture/Particle size:	Fine, poorly graded sand with no silt
Visual or olfactory evidence of contamination:	NO - no sheen or odor
Depth of solids in area where sample collected:	1/2"
Amount and type of debris:	Few metal shavings
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	
Samples delivered to lab? (Y)N	Lab ID Number: CO # 030834
Describe any deviations from standard procedures:	—

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

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

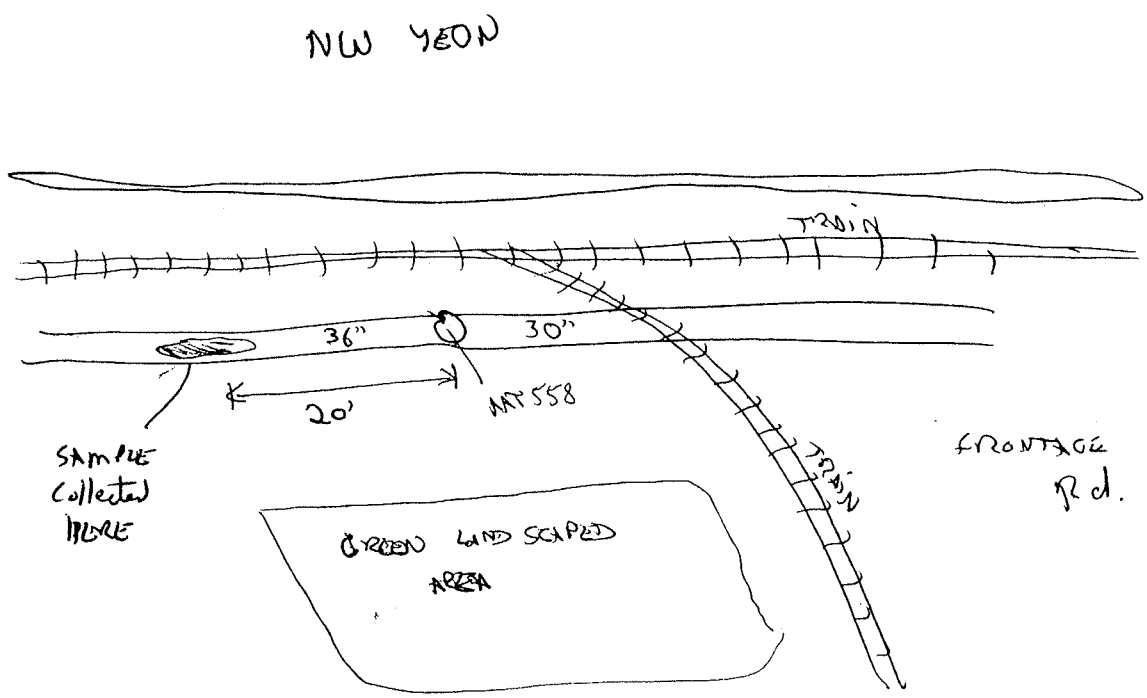
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-19-03	Time: 1313	Current Weather conditions: SUNNY 70's
Sampling Team Present: DAC, MKS, MJH		
Basin: 18	Node: ~~AAT~~ 558	Subbasin: UNK NOT LISTED IN SAP
Address: 3900 NW YEON		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	MINIMAL FLOW
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES 20' DOWN FROM AAT558
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	20' DOWN FROM AAT558 IS A 6' LENS OF SANDY SEDS.

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation
SITE CONDITIONS DO NOT MATCH OUR MAPS.



SECTION 2 - SAMPLE COLLECTION REPORT

Node: ANT558

Sampling Equipment:	SS SPOON + SS BOWL
Equipment Decontamination process:	PER SOP 7.01a
Sample date: 8-19-03	Sample time: 13:25
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-ANT558-0803
Sample location: (number of feet from node of entry)	20' DOWN
Sample collection technique:	SS SPOON USED TO COLLECT SED INTO SS BUCKET. SAMPLE BROUGHT TO SURFACE, COMPOSITED AND PUT INTO LAB SUPPLIED JARS
Color of sample:	DARK GRAY
Texture/Particle size:	SANDY
Visual or olfactory evidence of contamination:	NO, NO sheen
Depth of solids in area where sample collected:	1"
Amount and type of debris:	NO
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: 60030835
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

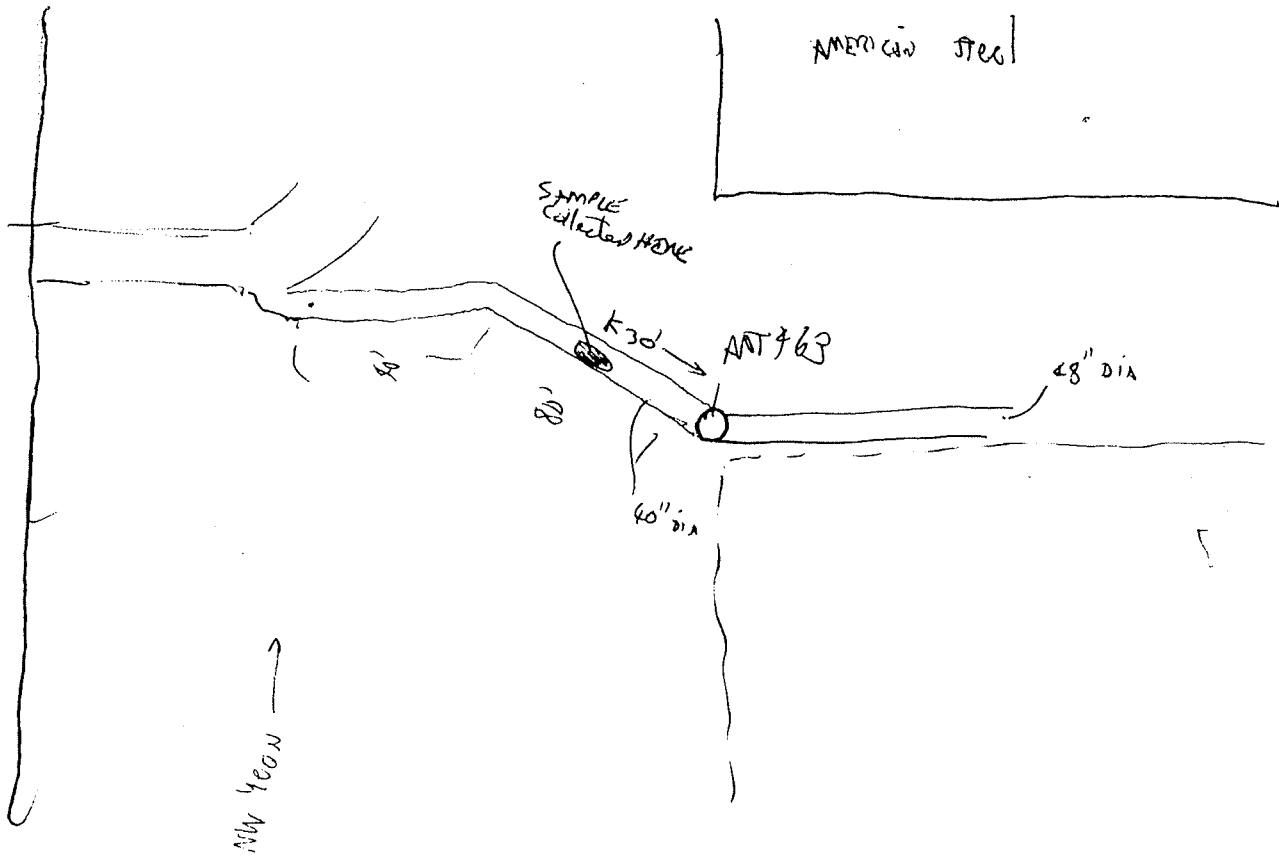
Date: 8-19-03	Time: 1024	Current Weather conditions: SUNNY 80'S
Sampling Team Present: MJH) MKS	DAE	
Basin: 18	Node: ART 463	Subbasin: 1
Address:		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	6" OF STANDING WATER AT NODE
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES 30-33 FEET DOWN 1½-2" DEEP. WATER 10" DEEP
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	FROM 25' DOWN TO AT LEAST 100' DOWN

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

PIPE DIMENSION DO NOT MATCH THOSE ON SAP.



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT 463

Sampling Equipment:	SS SPOON + BOWL
Equipment Decontamination process:	per SOP 7.01a
Sample date: 8-19-03	Sample time: 1939
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-AAT463-0803
Sample location: (number of feet from node of entry)	FROM 30-33' DOWN
Sample collection technique:	SS SPOON INTO BUCKET. BUCKET RAISED TO SURFACE. SAMPLE HOMOGENIZED, + PUT INTO
Color of sample:	BLACK
Texture/Particle size:	SAND
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1½-2"
Amount and type of debris:	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	2	
	PAHs/SVOCs	One 4oz glass jar	2	
	PCBs	One 4oz glass jar	2	
	TPH (two jars)	Two 4oz glass jars	2	
	TOC	One 4oz glass jar	2	

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 030836
Describe any deviations from standard procedures:	

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

City of Portland
Environmental Services

DAILY FIELD REPORT

Project Lower Harbor Outfall Sediment Sampling
Project No. 1020.001
Location Basin 18 - Day 2
Date 8-20-03
Subject Field Notes
By MJH

830 Prep at WPCL. Proceed to NW YEON.

900 Meet Dave Lovell of CH2MHill at NW YEON. WE DECIDE TO CHECK OUT THE NODE JUST WEST OF THE ENTRANCE TO BN.

940 SET UP TRAFFIC CONTROL DAC ENTERS MH TO INSPECT. THESE ARE THE FINDINGS

① THIS NODE, IN THE VEGITATED AREA NORTH OF NW YEON WEST OF ENTRANCE TO BN IS THE CONFLUENCE OF THE LINE TO THE EAST THAT COMES DOWN THE FRONTAGE ROAD, AND THE LINE COMING OUT OF THE INDUSTRY TO THE SOUTH OF NW YEON. (THIS IS IN A DIFFERENT LOCATION THAN THE MARVIEW MAP SHOWS)

② THE LINE COMING FROM THE WEST DOWN NW YEON THIS NODE 464 AT THAT NODE. THIS IS ALSO DIFFERENT.

③ THE STORM DRAIN LINE SHOWN ON NORTH SIDE OF NW YEON IS ACTUALLY ON THE SOUTH.

④ THIS LINE EXTENDS AS FAR WEST AS EXPRESS AVE. THIS WAS CONFIRMED.

1110 LOCATED PAT 453 AND SET UP TRAFFIC CONTROL. THERE IS SEDIMENT AT THIS LOCATION. SEE COS FOR DETAILS

Attachments

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

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

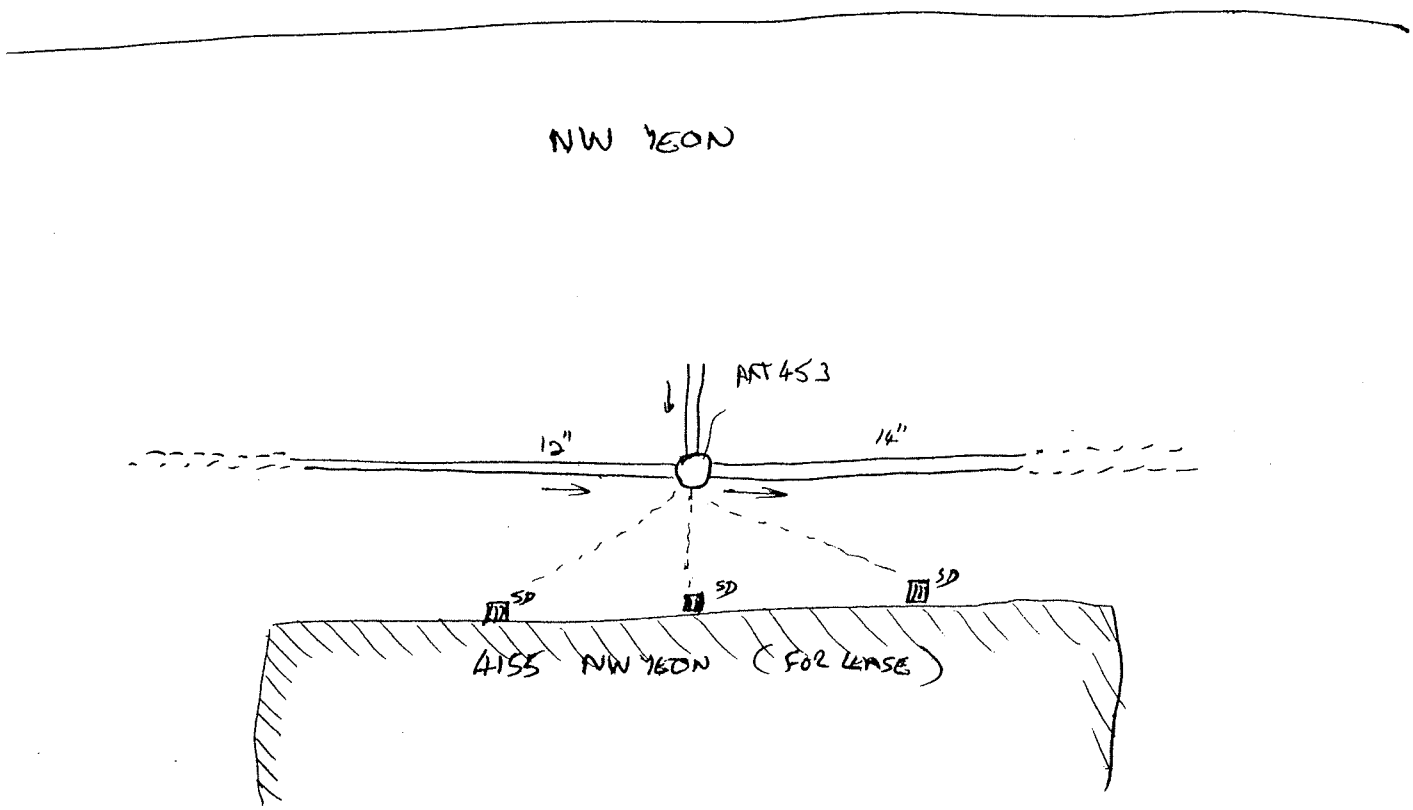
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-20-03	Time: 1123	Current Weather conditions: SUNNY 70's
Sampling Team Present: MJH / DAC) JJM		
Basin: 18	Node: ART 453	Subbasin:
Address: 4155 NW YEON		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	NONE
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO
Are sediments observed in the line?	YES - MOSTLY UPSTREAM
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	ATLEAST 3' UPSTREAM

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT 453

Sampling Equipment:	STAINLESS STEEL SPOON + SS BUCKET
Equipment Decontamination process:	PER SOP 7.01a
Sample date: 8-20-03	Sample time: 1140
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18 - AAT 453 -0803
Sample location: (number of feet from node of entry)	DIRECTLY UPSTREAM FROM NODE
Sample collection technique:	SAMPLE COLLECTED W/ SPOON AND PUT INTO BUCKET, BUCKET BROUGHT TO SURFACE, HOMOGINIZED AND PLACED INTO LAB SUPPLIED CONTAINERS.
Color of sample:	DARK BROWN
Texture/Particle size:	SANDY GRAVEL W/CLAY
Visual or olfactory evidence of contamination:	SLIGHT PETROLEUM ODOR
Depth of solids in area where sample collected:	1"
Amount and type of debris:	—
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	N	
	PAHs/SVOCs	One 4oz glass jar	N	
	PCBs	One 4oz glass jar	N	
	TPH (two jars)	Two 4oz glass jars	NN	
	TOC	One 4oz glass jar	N	

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 030837
Describe any deviations from standard procedures:	—

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	N
	Homogenized sample	N

CITY OF PORTLAND

ENVIRONMENTAL SERVICES

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

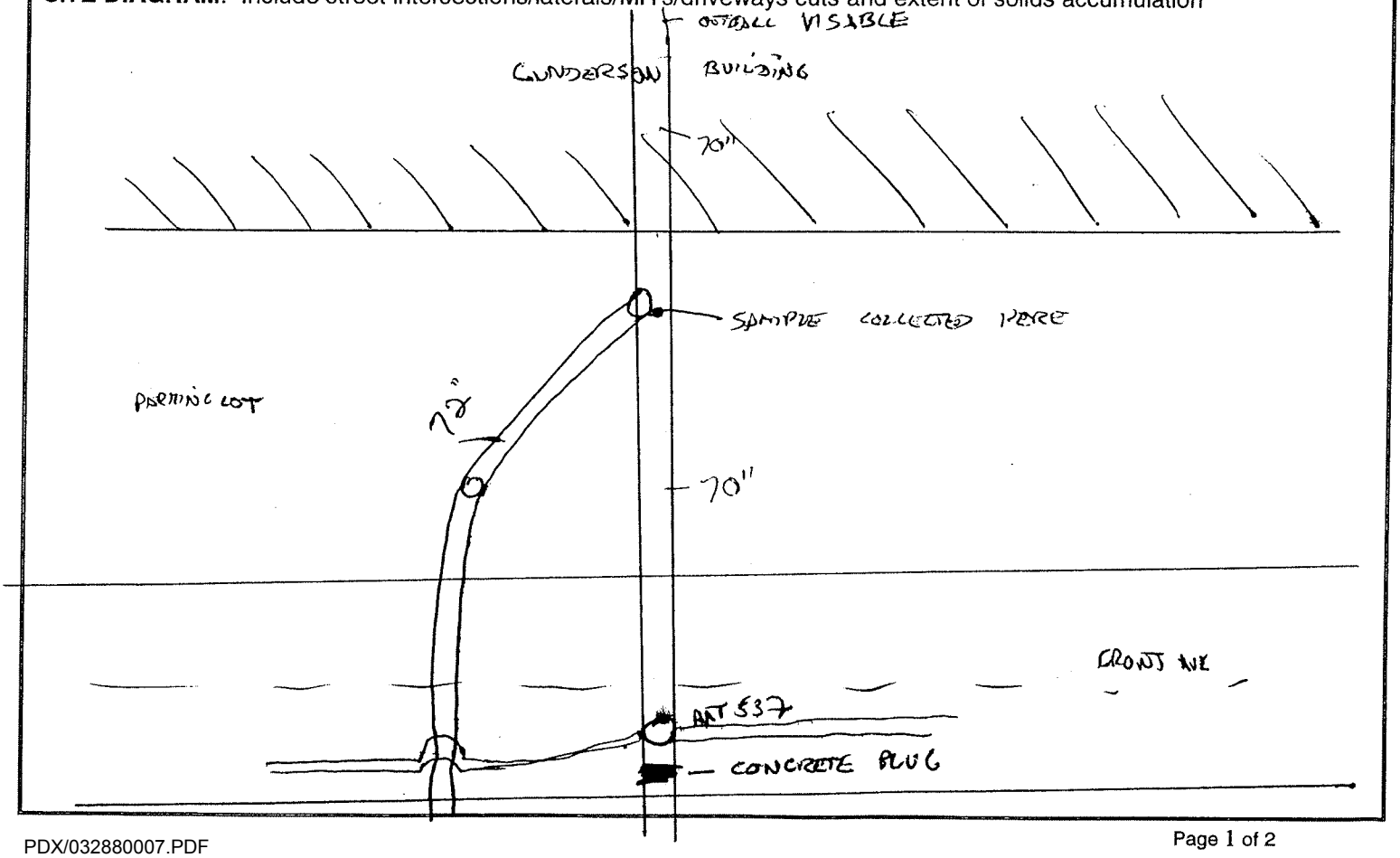
LOWER HARBOR OUTFALL SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

Date: 8-20-03	Time: 1930	Current Weather conditions: SUNNY 70'S
Sampling Team Present: MJH/DAC) JJM/AC		
Basin: J8	Node: AXT534	Subbasin:
Address: CUNDERSON		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	2" OF CLEAR FLOW COMING DOWN 72" PIPE.
Does river appear to back up to this location? Describe rate/color/odor of flow:	NO.
Are sediments observed in the line?	YES. AT JOIN OF 70 + 72" LINES
Are sample-able quantities of sediments present in the line?	YES
Describe lateral extent of sample-able sediments present in the line:	SEDS OBSERVED JUST AT THE JOIN, ALL LINES ARE CLEAN

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



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAT 537

Sampling Equipment:	STAINLESS STEEL SPOON + BOWL
Equipment Decontamination process:	PER SOP 7.01a
Sample date: 8-20-03	Sample time: 19:45
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-18-AAT537-0803
Sample location: (number of feet from node of entry)	AT NODE OF ENTRY - CONFLUENCE OF 72" PIPE AND 70' PIPE
Sample collection technique:	SEDIMENT SPOONED INTO BUCKET. BUCKET BROUGHT TO SURFACE SAMPLE HOMOGINIZED AND PUT INTO LAB SUPPLIED CONTAINERS
Color of sample:	BLACK
Texture/Particle size:	SAND
Visual or olfactory evidence of contamination:	NO
Depth of solids in area where sample collected:	1"
Amount and type of debris:	—
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	2	
	PCBs	One 4oz glass jar	3	
	TPH (two jars)	Two 4oz glass jars	4,5	
	TOC	One 4oz glass jar	6	

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 030838
Describe any deviations from standard procedures:	

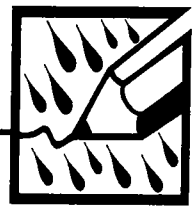
SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

APPENDIX B
Field Notes

"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 —

8-12-03

In line Sampling

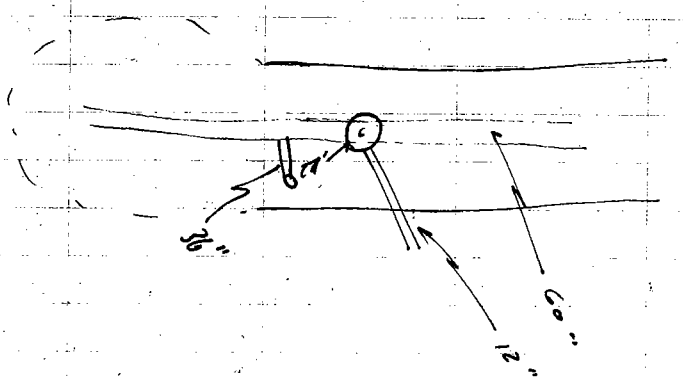
900 On site D. Lacey, Dawn Sanchez/BES, Doug Huckaway/BES

Objective: Collect In line sediment samples

Weather: Sunny, 70°F

905 Start Sample Collection at AAM 107

Sewer Diagram



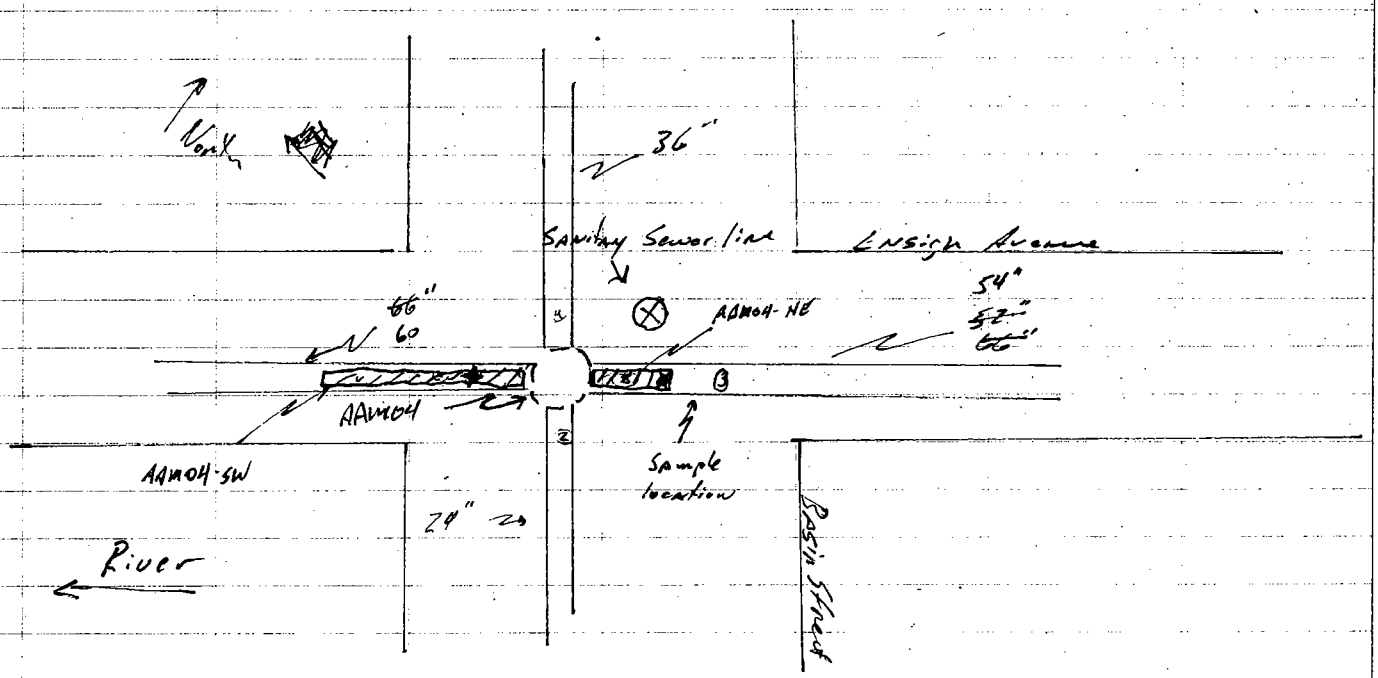
- No sample collected
- Sewer Observations.
  - A small lateral enters into the line directly at the manhole, approximately 12" diameter
  - A medium 36" line enters the main line approximately 20-feet from the ~~main~~ AAM 107
  - Flow in the line is approximately 2" deep and 18" wide apparently 10 gpm to 15 gpm
  - No solids were observed below the water.
  - A film was observed above the present water line. This film was an orange/brown iron oxide color. Field crew collected a small sample by scrapping the side of the pipe.
  - The sample was ~~80% g~~ DL 80% ground, 20% fines. The fines ~~appeared~~ to be from biological activity. Fines ~~were not silt or~~ did not appear to be silts or clay.

8-12-03

In-Line Sampling - BES

945 Moved to sample location AAMOH

Site Diagram



- Flow: Flow from pipe ③ and ④ the majority from ③.
- Observations: A ½" layer of orange/brown iron oxide colored material located at the bottom of the line (under 2" of flowing water). The pipe fans out approximately 6-feet from the manhole. Sediment was observed up to 3½" deep in the fanned pipe. After the pipe returns to 57" diameter little sediment was observed.

Sample Collected AAMOH-NE

- Beneath the lighter fines is a layer of stabilized material. The material is solid, easily broken apart, orange/brown. The material appears to be the result of accumulation and deposition of the lighter material. ~~This material was not~~ BG Large pieces of this material was ~~not collected~~ NE removed from the sample
- Sample observations.
  - A faint, discontinuous sheen was observed on the pore water in the sample bucket
  - (SILT Like), Orange brown, Wet, Bituminous ¼ to 1" worms.

Sample Location 0-6 feet NE of AAMOH

8-12-03

BES - In Line Sampling

1040 Collected sample from pip @ SW AAM04-SW
This sample was an opportunity sample collected because no sample was collected at AAM007.
It will not be submitted it to the lab if successful samples are collected AAJ810 & AAM105.

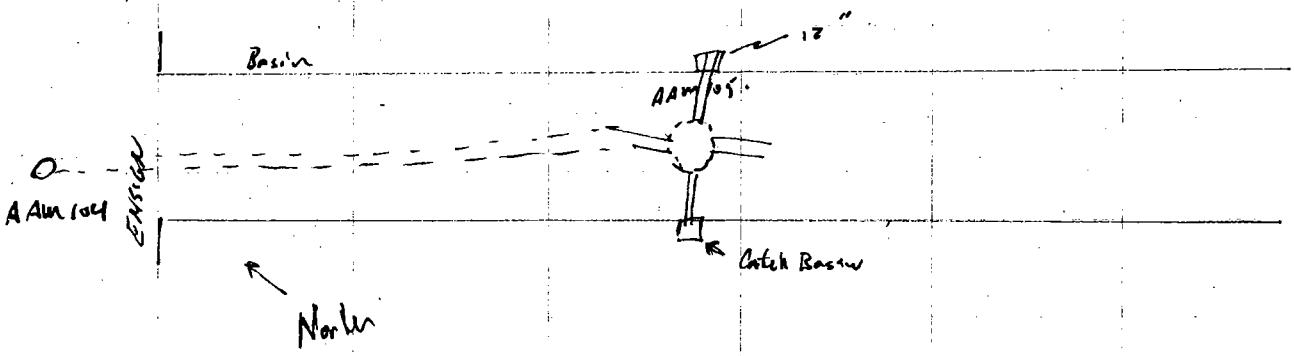
Sample location - 0 to 20 feet SW of AAM04.

Sample observations: (SILT LIKE), Orange brown, Wet, 5% sand.
The sample was collected from a slight depression which initially appeared to be sand however the sand was only a thin layer at the start of the depression.

AAM04 Node Observation Summary
- Convergance of 4 pipes NE, NW, SE, SW
- Flow out 10gpm NE
- Flow out 5gpm NW
- Up to 3/4" sediment from ~~0-20~~ 0-6 feet in NE pipe
- Up to 1/2" sediment from 0-20 in SW pipe
- Flow out 15 gpm SW
- Flow out 0 gpm SE
- No sediment observed in NW & SE pipe
- Samples collected at AAM04-SW and AAM04-NE

1110 Mobilized to AAM105

Node Diagram



8-12-03

In Line Sampling

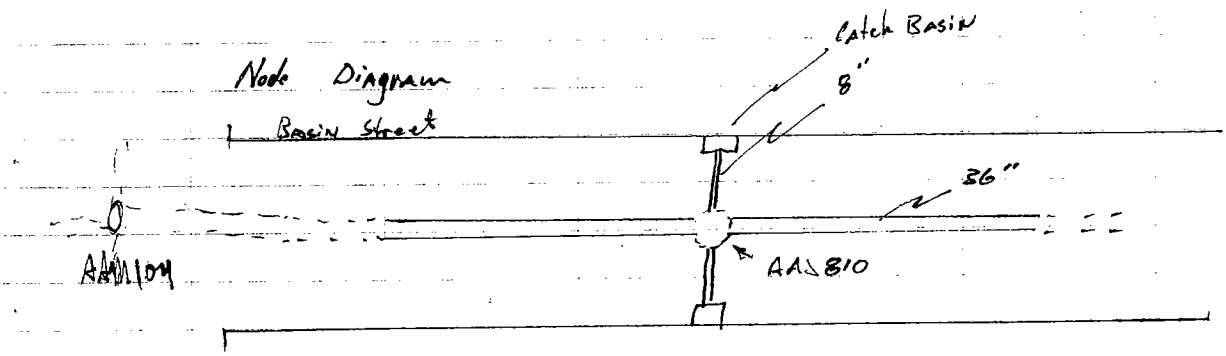
Node AAM105 Observations.

- Pipe measured at 24". Sample can only be collected within arms reach of the Node.
- No sediment absent in pipe
- Two small 8" inch pipes enter at the node from catch basins on either side of the road.
- Bottom of pipe wet but no standing water
- Orange/brown staining approximately 2" wide however no sediment.
- No other laterals observed. Doug looked with a flash light and could see approximately 20-feet upstream and down stream

No sample collected

1140 Mobilize to AA3810

Node Diagram



Node observations

- Pipe measured to 36"/~~37~~". Doug enter 50/~~70~~-feet into the down stream. Movement is difficult. 25-feet upstream
- No sediment, No film, ~~water~~ i
- Flow ~ 5gpm, clear
- Line is very clean.

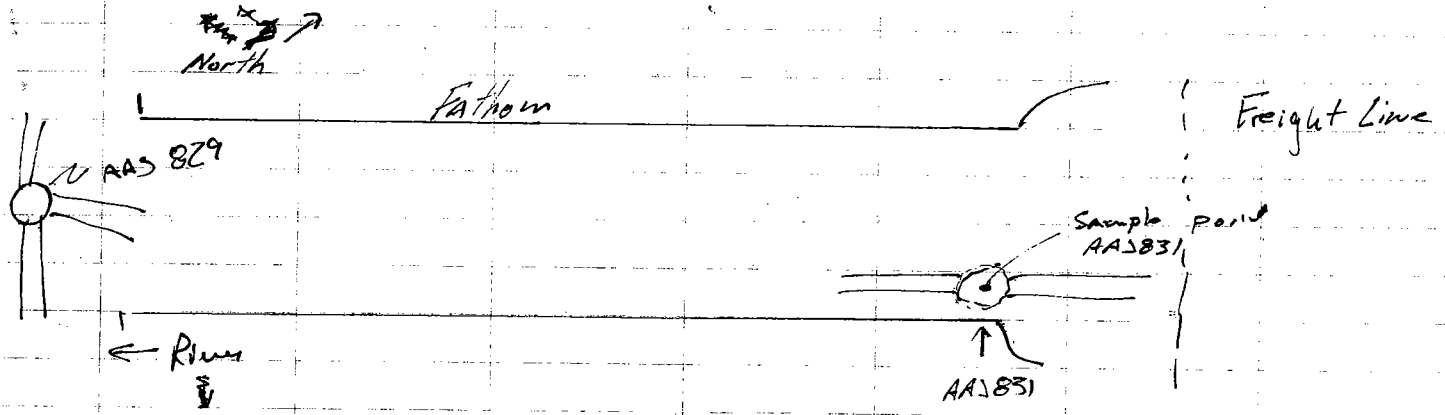
No Sample collected

1210 off site for lunch

8-12-03

In Line Sampling

1300 Mobilize to AAJ831



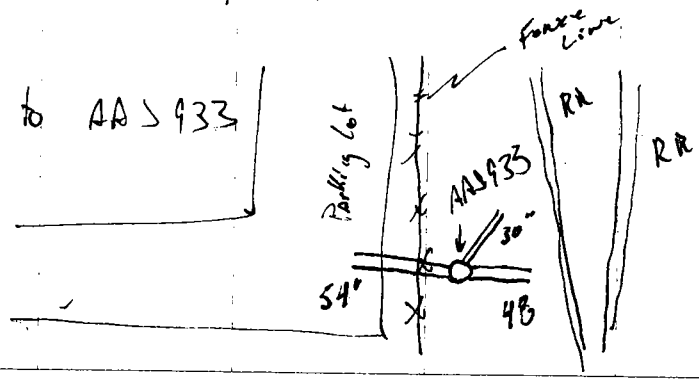
Node Observations

- Flow - 3/4" of water above sediment = 5 gpm
- 6" of sediment which extends at least 20-feet both upstream and downstream
- Sediment appears to be sand with miscellaneous debris including pieces of plastic, metal (washer), paint chips.
- No other pipes observed.
- Sample was collect at node location. Field team did not go up the line.
- During sample collection a petroleum odor and sheen was observed. Sample was collected with stainless steel shovel. No other sampling device was available

1355 Sample AAJ 831 and duplicate

- SAND. SP. Dark gray, wet, Medium to fine grain, SP
- Slight petroleum odor
- Sheen observed on the sewer water during collection but not on sample.
- Lots of ~~dark debris~~ DL plain chips 1%.
- ~~Throughout~~ entire 6" depth of sediment sampled.

1400 Mobilize to AAJ933



8-12-03

In Line sampling

AAJ933 Node Observations

- Two pipes enter at this node a 48" from the NE which is shown on the map. A 30" from the North which is not shown on the map.

- Flow in from the 48" was approxmitly 5gpm. 1/3" of flow. the water ~~had a slight organ/brown tint~~ was clear.
- Flow in from the 30" was approximatly 5gpm 1/3" of flow. The water was cloudy ~~without color~~ & slightly gray.
- A thin film of organ/brown silt like material was observed in the 48" pipe. It was not thick enough to sample. It was similar to AAM107. Did not enter pipe
- ~~Not~~ No solids were observed in the 30" pipe. Did not enter the pipe
- Flow out from the 54" pipe was approximatly 10gpm. and slightly cloudy
- Sediment in the 54" was 1" deep and organ/brown

Collected AAJ933

- Location 0-10 feet downstream of Node
- (Silt like), Orange/Brown (from Oxide color). Wet. Very soft, No ~~the~~ sand.
- No debris or odor

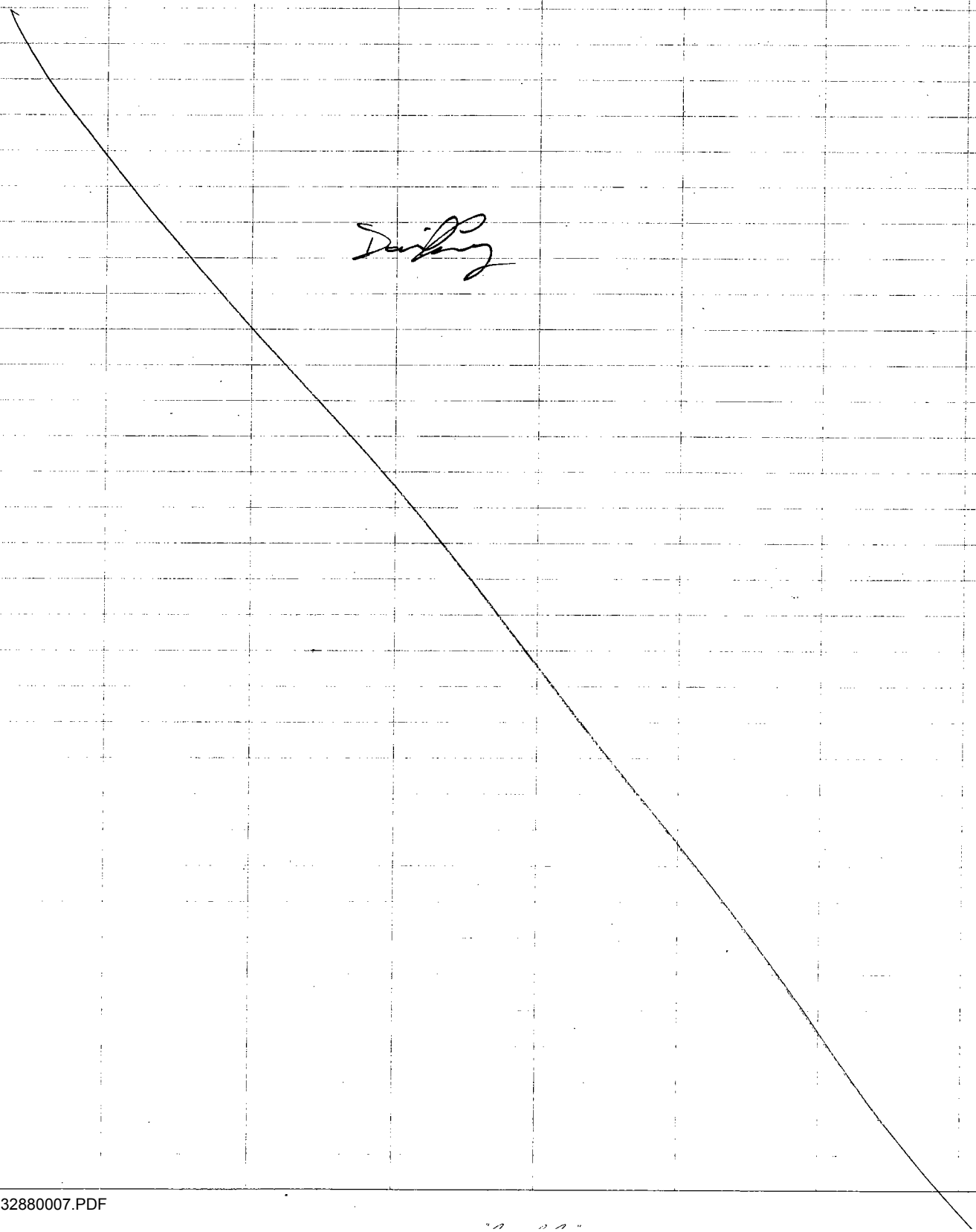
1530 ~~Contin~~ Conversation with Dawn Sanders. Informed her that no ~~ste~~ sediment was ~~observe~~ observed at AAM105 and AAJ810. Decided to attempt sampling in manholes upstream of inital location.
Discussed with Doug/BES. He stated that we will attempt sample collect tomorrow possably after Basin 18 samples b/c traffic is to busy today to close lanes on Basin 55 at this time.

1535 OFF Site

8-12-03

BES - IN Line Sampling

1400 Contacted Dawn Sanders. Decided to attempt sampling at additional manholes in Basin M1 first thing tomorrow.



8-13-03

BBS - In Line Sample

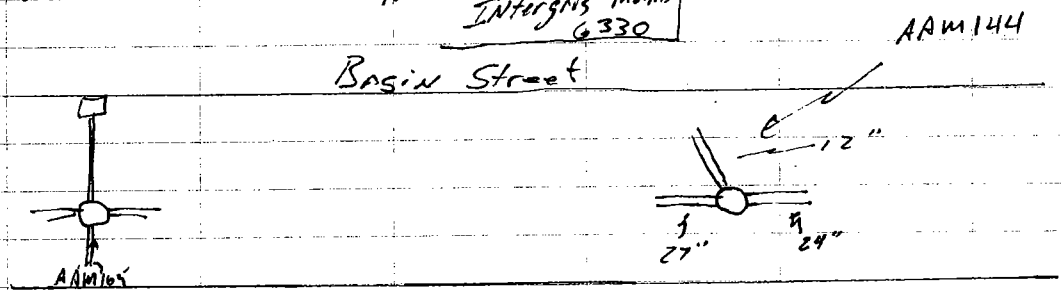
900 On site: D. Lacey, D. Hutchinson

Objective: Collect samples in manholes upstream of AAM105 and AAJ810.

Weather: Sunny, 70°F, Clam Wind

915 Mobilize to Node AAM144

Intergris Motels 6330



6235 Sandy Island Commercenter

Node Observations

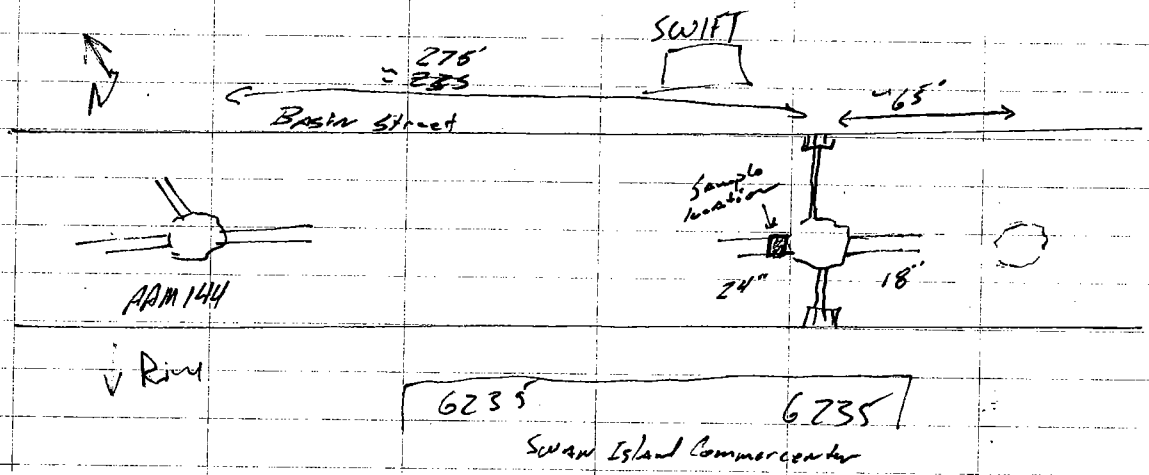
- A 12" pipe enters from the North. The pipe and Node below the pipe is moist indicating a potential past release.
- No sediment observed in 27" downstream pipe. Bottom of pipe damp. No staining in pipe.
- No sediment observed in 24" upstream pipe. Bottom of pipe damp. No staining in pipe.
- Visually inspected from node. Size of pipe restricted entry.

No Sample collected

8-13-03.

BES- In Line Sampling

9:30 Mobilized to AAM 155



Node Observations:

- ~~Standing water in node extends upstream and downstream of node~~ the area of the manhole and is approximately 2" deep.

- Sediment observed in manhole and appeared to extend in both directions for at least 20-feet. The size of the pipes did not allow for access. Extend of sediment based on visual observation from manhole. and is 3½" deep at the node.

- Sample will be collected from inside the pipe downstream of the manhole, in area with no standing water.

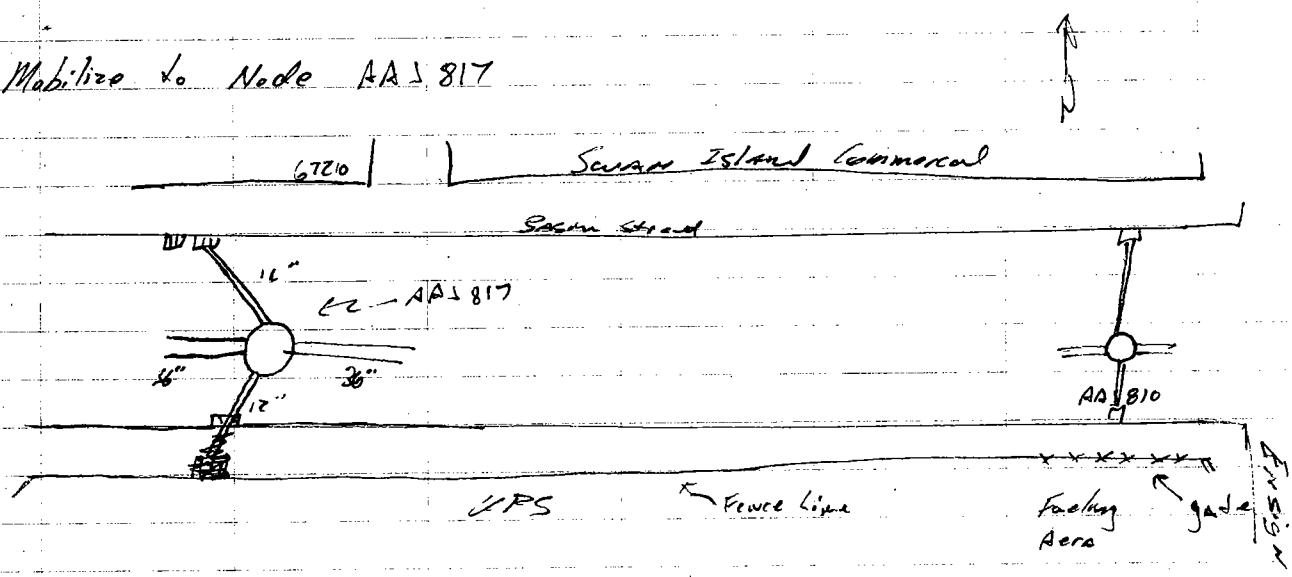
Sample AAM 155

- Location: 0-18" in pipe downstream of Node.
- Sediment appeared to be stained below 1." Black Sediment appeared brown in the upper inch and black below, during collection a slight petroleum odor observed
- Sand, (SW) Black, wet, 5% gravel up to 3". well rounded. Medium grain Gravel appears to be landscaping rocks. No silt in sample
- Moderate sheen observed on pore water. Sheen lightly covered entire pore water. No odor observed in sample.
- Metal debris (~~Nuts~~ Nuts, washers) observed in manhole but not in the sample.

8-13-03

BES- In line sampling

1010 Mobilize to Node AAJ 817

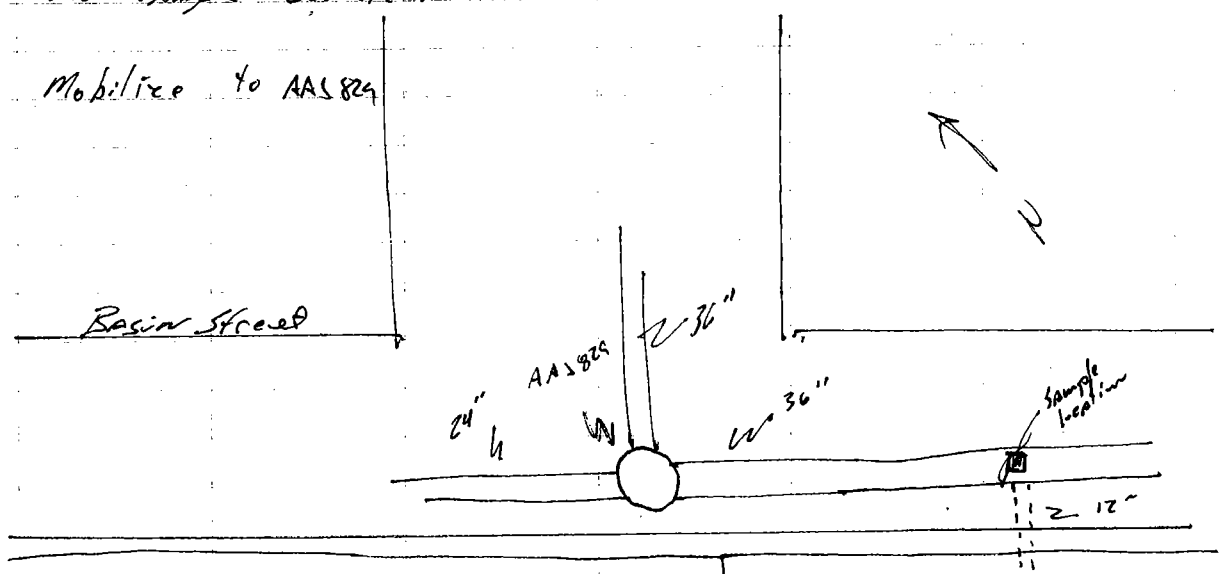


Node Observations

- Flowing water observed in manhole. Estimated 5gpm.
- No sediment at manhole
- Crawled upstream approximately 100-ft. No sediment or other lines entering the main line.
- Crawled downstream approximately 100-ft. No sediment or other lines entering the main line. Two bolts and a pipe joint.

No Sample Collected.

1110 Mobilize to AAJ 824



8-13-03

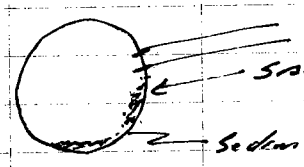
BES- In Line Sampling

Node Observations AAJ829

- Two lines enter. One line leaves
- Flow from NE line (Freight River Site) ~ 5 gpm clear
- Crawled downstream 100 feet. Small area of Orange/Brown silt like material approximately 80 ft at the end of a small lateral which enters the main line from the Southwest. The small lateral line does not have any sediment and is to small to enter.
- Can not enter upstream line to the North West b/c it is to small. No sediment or flow observed.
- Did not enter upstream line to the Northeast. Approximately 5 gpm flow and NO sediment was observed.
- Contacted Dawn. Decided to collect sample

Collected Sample AAJ829

Location: 80 feet from AAJ829 directly below small lateral on the side of the main line



- Photograph taken- Soilds appear to be coming from the the juncture between the two lines. No staining is observed in the small lateral. Soilds appear to be the result of green water flowing through this juncture

- Soilds similar to the stratified soilds observed at AAMOUNE The sample is orange brown, stratified, moist, non-cohesive, & crumbles easily.

8-13-03

BES - In Line Sampling

1216 Mobilized to next manhole upstream of MH 829

- Did not enter manhole.
- Observed from street. No flow. ½" standing water. Not sampleable. Minor amount of gravel

1230 Contacted Dawn Sanders, for Field Summary
- Informed her that Doug will contact her regarding his availability to begin sampling in Basin 18

8-19-2003

BES- Source Control In Line Sampling

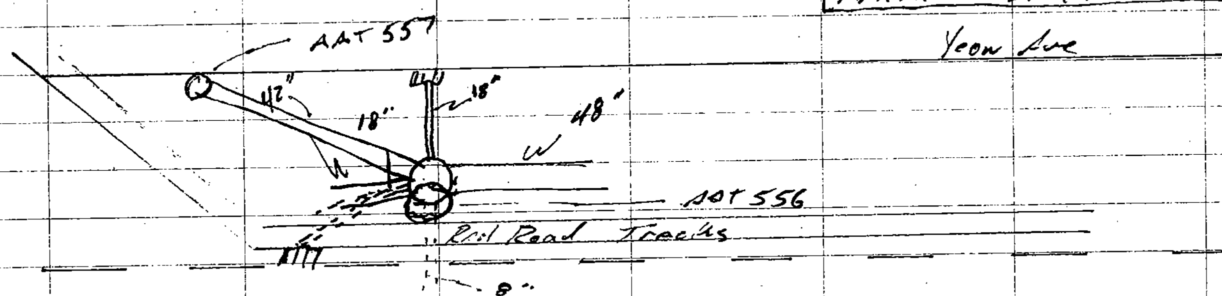
855 On Site D. Lacey, ~~AJD. BES~~ Mike D/BES, Maggy, Darik

Weather: 65°F, Cloudy, Wind Calm

Objective: Collection of solids from selected locations in Basin 18.

9:00 Review sampling contingencies as specified by Dawn Sanders.

Mobilize at Node AAT 556



Node observations

- Three small lines enter at the top of the manhole. These lines appear to lead to catch basins as shown above.
- The main line in is a 42" line from the ~~Sho~~ Southeast.
- The main line out is a 48" line to the Northwest.
- A small amount of "Sand and silt" was observed at the base of the manhole. However it was not enough to sample. Megan/BES entered the manhole.
- Downstream - Approximately 3" of flowing water. ~~B~~ An 1/8" of sediment was observed at the base of the pipe. The sediment extend from 0 to 100' downstream of the manhole. This sediment was a "Fine silt" (Megan-BES) and could not be recovered due to the flowing water.
- Upstream - Approximately 3" flowing water. Toward AAT557. No sediment.
- Upstream. Toward AAT 558. Did not enter. However, No water and no sediment was observed visually from the manhole.

No Sample collected.

PDX/032880007.PDF

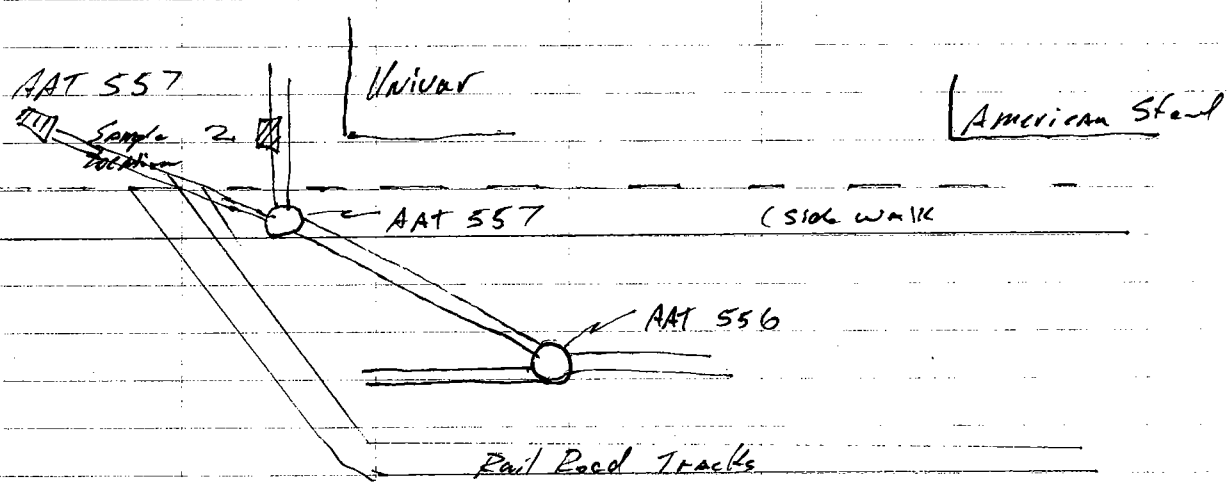
8-19-2003

BES Source Control In Line Sampling

10:00 Mobilized to AAT 557

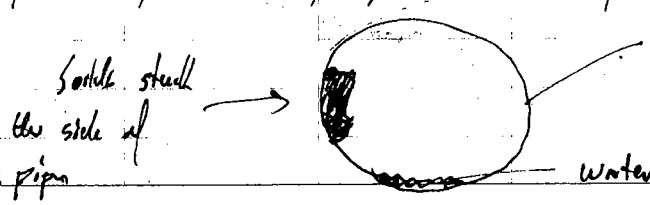
Contacted Dawn Sanders - The accutal sewer line layout is different from the map. It appears that the two lines merge at AAT 556 not at ~~AAT 465~~ AAT 465 as shown on the city map.

- Decided to ~~app~~ attempt sample collection at AAT 464 / AAT 465. Note AAT 555 was not observed in the field.
  A sample will also be attempted at AAT 558.



Node Observations

- One small line enters at the top of the manhole which appears to drain a catch basin in an adjacent parking lot
- A 42" pipe enters the manhole from the southwest
- A 42" pipe exits the manhole to the Northwest which leads to AAT-556.
- Approximatly 3" of flowing water was observed.
- No sediment was observed at the manhole or in the downstream pipe.
- A "shelf" (photo taken) of stratified soils was observed approximatly half way up the sides of the pipe



8-19-2003

BES - Source Control - In Line Sampling

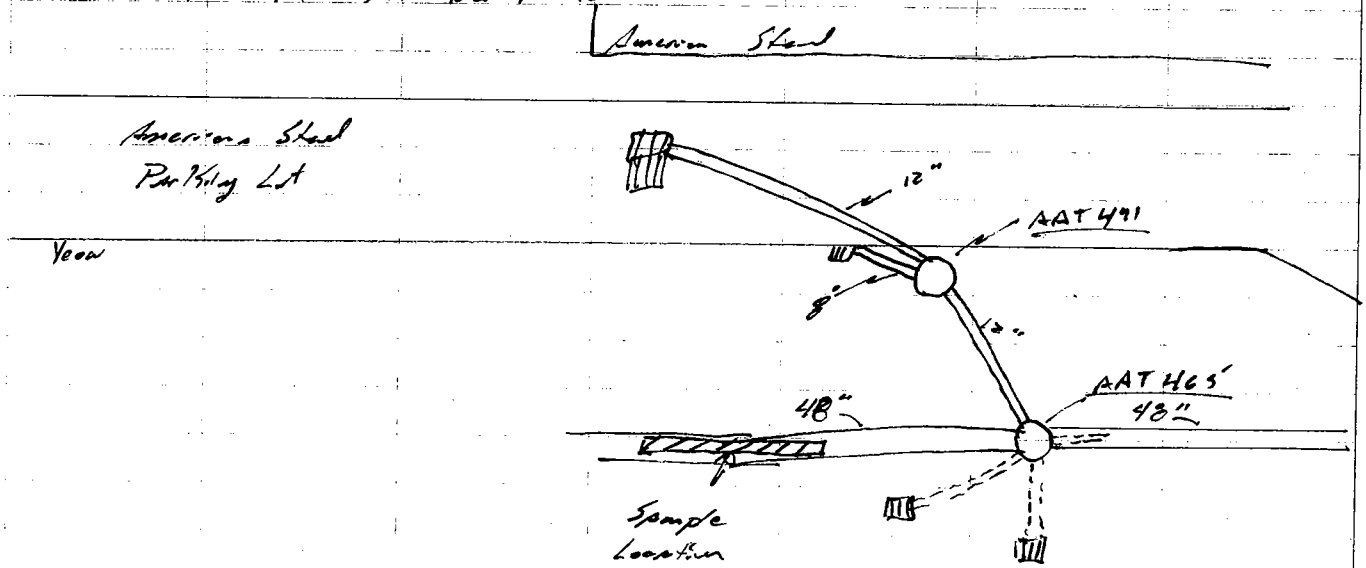
- The "shelf" of solids was approximately 6" thick, 6" wide and three feet long.
- A large piece of this "shelf" was collected as a sample

AAT 557 Sample Collected

Sample Observations

- SILT, (MH), Dry, Gray (Stratified with Black, gray and orange/Brown (Fe oxide) layers). No cohesion or plasticity observed after addition water.
- No odor or staining.
- No debris

1045 Mobilize to AAT 491 and AAT 465



AAT 491 Observations

- Two small lines enter this manhole one drains a street catch basin approximately 5-ft away. The other drains a catch basin in the American steel parking lot
  One small line (12") exits at this manhole and leads to AAT 465
- No water was observed at this Node location
- No sample was collected

8-19-2003

BES- Source Control In line sampling

AAT 465 Observations

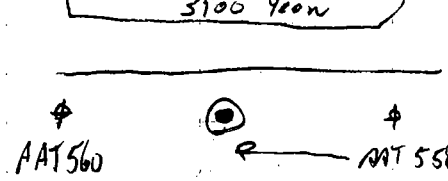
- Four small lines enter at the top of the manhole and appear to lead to street catch basins in the area, one of the small lines leads to AAT 491
- A 48" line enters the manhole from the south west.
- 1" of flowing water observed.
- 1-inch thick layer of sand observed approximately 80 feet upstream of the manhole
- No lines entered the main line either up stream or down stream. Mike investigated 80-feet in both directions.
- Sample will be collected.
- Sand band approximately one inch wide and 1/2" deep. The sample was collected from 80 to 60-feet from the manhole. The band was located at the center of the pipe

1136 AAT 465 Observations

- No Oder, No sheen
- SAND, (SP), Wet, Black, Fine to Medium grain. Small amount (<1%) fine gravel. No silt.
- Many small red worms in the sample.
- Small amount (<1%) of small (1mm) metal shavings

1240 Mobilize to AAT 558

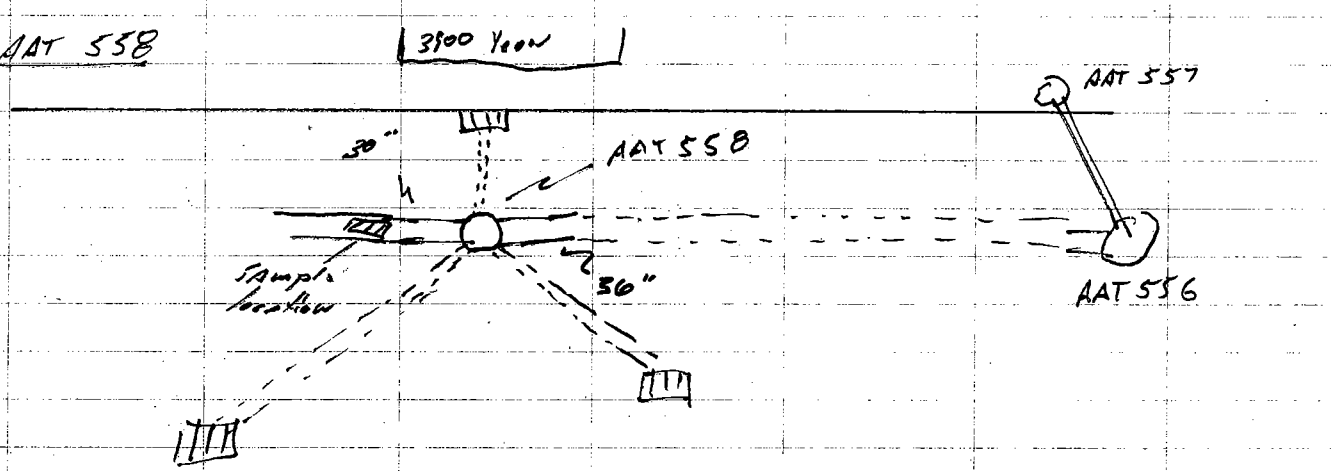
- Sewer line layout appears to be different than City maps. Manholes AAT 558 and AAT 560 are shown to be in front of Contain Recovery Inc 3900 Yeon as shown below



However only one was observed in the field. This ~~sample~~ Node location is refered to as AAT 558. It is the first manhole up stream of AAT 556.

8-19-2003

BES - Source Control / In Line Sampling



Manhole Observations

- Three small lines enter at the top of this manhole which appear to drain three catch basins in the area from the street.
- ~~No flowing or standing water at manhole.~~ DC <1gpm
- No sediment at manhole.
- One # 36" pipe exits the manhole to the Northeast.
- ~~Doug~~ DougK walk up down the 36" pipe. A small sand deposition observed 20-feet from the manhole
- Investigated 100-feet up the 30" pipe. No sediment.
- Sample will be collected from area 20-feet down stream of manhole. Sand bed ½ deep 6-feet long
- No odor or Odor
- ½" flowing water over sample.

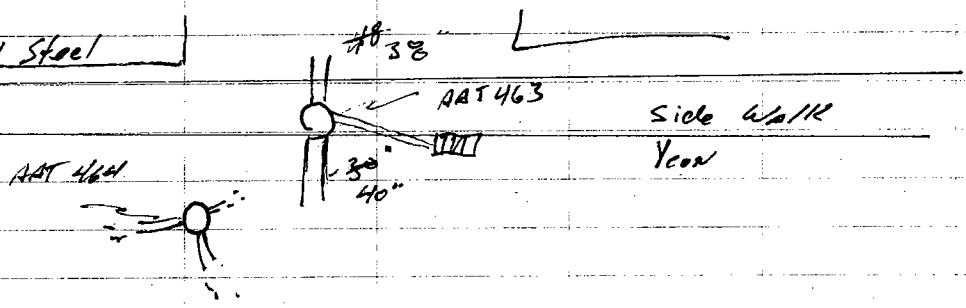
Sample AAT 558 Observations

- Sample collected ~ 20-26-feet from manhole
- No odor, No sheen
- A thin black viscous layer observed below the sand layer. The bottom of the pipe was scraped for this layer.
- SAND, (SP), Black, Wet, Medium to Fine grain. Small amount (<1%) of organic matter (grass, twigs), Small Amount (<1%) of green flakes. No silt.

8-19-03

BES- Source Control In Line Sampling

1400 Mobilize at AST 463



Manhole Observations

- 6" of standing water at base of manhole. Groundwater infiltration observed by Derek.
- 50ft Sand observed approximately 80-down from manhole in 40" pipe. 6" standing water
- Investigated upstream approximately 80-feet. No sediment but the water a orange/brown color.
- Called sample from 40" downstream pipe.
- One small pipe (12") enters at the top of the manhole and drains a street catch basin five feet away
- A 38" pipe enters the manhole from the south west
- A 40" pipe exits the manhole to the north east.
- Note: The pipe diameters are smaller than those indicated on the city maps. However, the manhole is in approximately the right place and both of the lines appear to be going in the right direction. One other manhole is in the area but appears to be Node AST 464.

Sample AST 463 Observations

- Sample locations 30-33 downstream of manhole
- SAND, SW, Gray, Wet, Medium to fine. No silt, no organic matter
- No odor, ~~No sheen~~ Slight sheen
- Small amount of debris (1%) red paint chip.

8-19-2005

BES- Source Control / IN Line Sampling

- After sample collect Investigated 100-feet downstream of manhole. A lateral joins with the main line approximately four feet past the maximum extent of the ball line.
  - Sed Solids were observed along the entire length of the downstream line.
  - The lateral appeared to enter from the right (South east).
  - After the lateral joined the pipe appeared to be a larger diameter.

- Opened MH 46H - Did not enter. Appears to have line entering from the Southeast and exiting to the North as shown on the city map. However, it appears that a line may also be entering from the Northwest (American steel parking Lot). Pipes appeared to be in the 24-30" range.

1500 OFF Site

8-20-2003

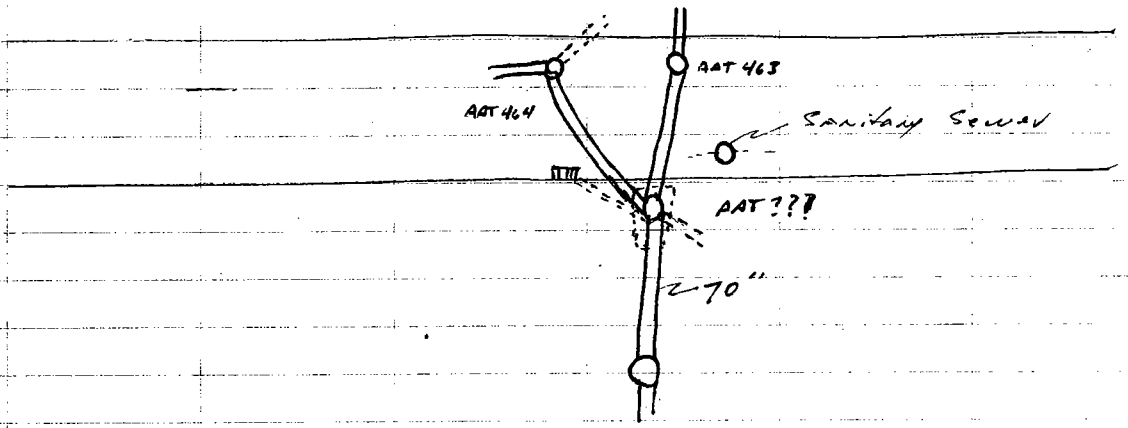
BES - Source Control - In Line Sampling

900 On Site D. Lacey, Mike/BES, Derik/BES

Weather: Cloudy, 65°F, Calm

Objective: Collect samples from AAT 452 & AAT 537.

Mobilize to manhole across the street from AAT 463 in order to confirm sewer line layout



Node Observations

- Derik/BES - Confirmed that this node (AAT ??) is connected to AAT 463 as noted yesterday. Node is also connected to AAT 464, which is different than shown on City Map. The Node (AAT ??) is a large chamber (10'x18').

- Solids were observed in all three main lines. Solids were mostly ½" rounded gravel.

- The sub basin 2 line was not observed. The City MAP showed this line entering approx. 10 feet to the southwest of this node however this line was not observed in either of the two lines entering this node.

8-20-2003

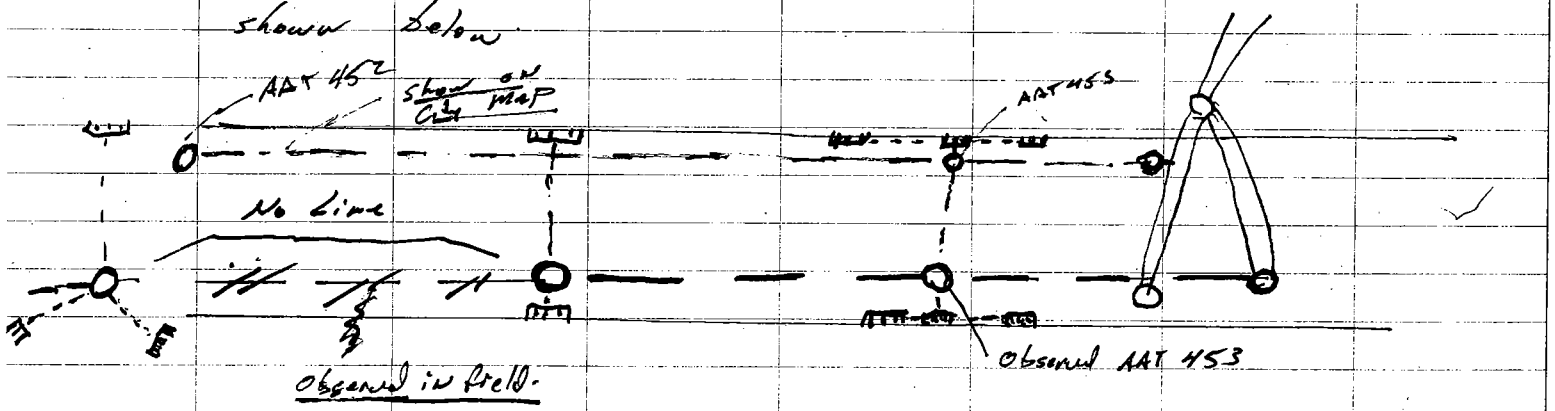
BES- Source Control In Line Sampling

1000 Mobilize to Node ~~AAT 300~~ AAT ??2.

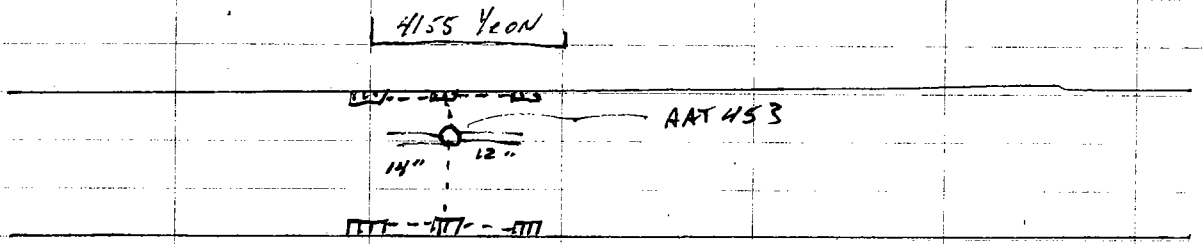
- AAT??2 is a sanitary line.
- It is unclear were the sub Basin 2 line enters into the Basin line

1030 Mobilize to AAT 452

- City map is incorrect. The storm sewer line runs down the southwest side of the road. The manhole layout is also differt. Line is shown below.



1100 Mobilize to manhole farthest South East. This node appears to be AAT 453



Node Observation

- Two small lines enter at the top of the manhole and appear to drain catch basins on both the sides of the street.
- A 12" line enters the manhole from the North West. A 1" band of sand was located starting at the base of the manhole and extending ≈ 2-feet up the 12" line. It was covered with a thin layer of orange/brown silt like material.

8-20-2003

BES- Source Control In Line Sampling

- A 14" line exits the manhole to the southeast. A thin layer of (<1mm) orange brown silt-silt like material covered the base of the manhole on the bottom of this pipe.

- A small amount of (<1) of standing water was observed in the 12" pipe. The base of the manhole was moist as was the 14" pipe. This appears to be the result of minim groundwater intrution at the base of the manhole or catch basins.

- A sample was collected.

Sample AAT 453 Collected

Sample Observations

- SAND, (SW), Gray (Red and Black grains), Wet, Medium.
- Minor amounts of grass, tree bark, and what appeard to be small pieces of Styro foam.
- Sand is diffent from that observed at the other sample locations in this basin. It is more grained and not a uniform color.
- No Odor. No Sheen.

1200 Lift manhole ~~lid~~ cover upstream of AAT 453. This manhole is Approximatly 50-feet SE of the Express Way & Yeon intersection.

1400

Node Observations

- Two small lines enter at the base of the manhole, which appear to drain catch basins on either side of the street.

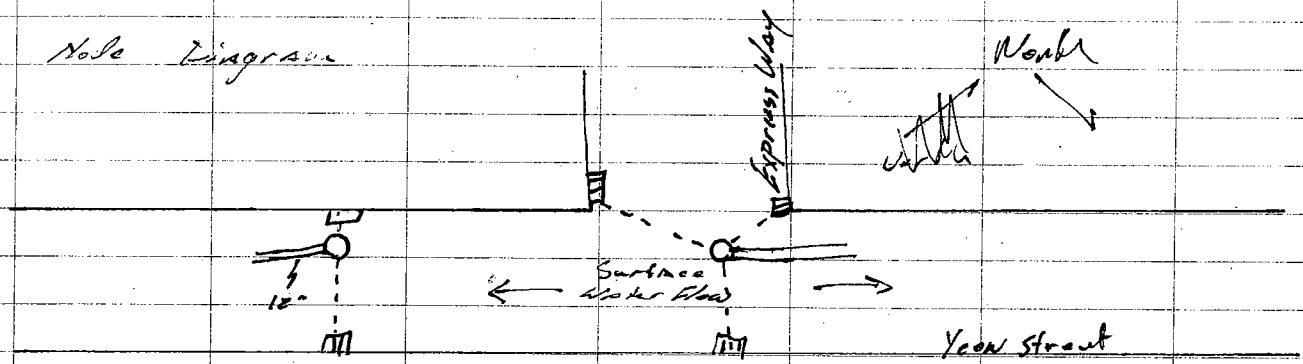
- No other lines enter the manhole

- A small line (≈ 12") exits the manhole to the southwest

8-20-2003

BES- Source Control In Line Sampling

Note Diagram



- Lifted manhole at intersection of Express Way and Yeon.
  - Three small lines enter at this manhole, which appear to drain three catch basins as shown above.
  - No other lines enter the manhole
  - One ± 12" line exits the manhole to the North west.

Note: Express way appears to be a topographical high. Surface water flow appears to be toward the South east and North west. Also, as shown above the sewer lines appear to flow in two separate directions. This may indicate that, Yeon street North west of express way drains to basin 19, not to basin 18.

Contacted Dawn Sanchez. Informed her of the difference between the City map and the observed storm water line layout, and the successful sample collection at AAT 455.

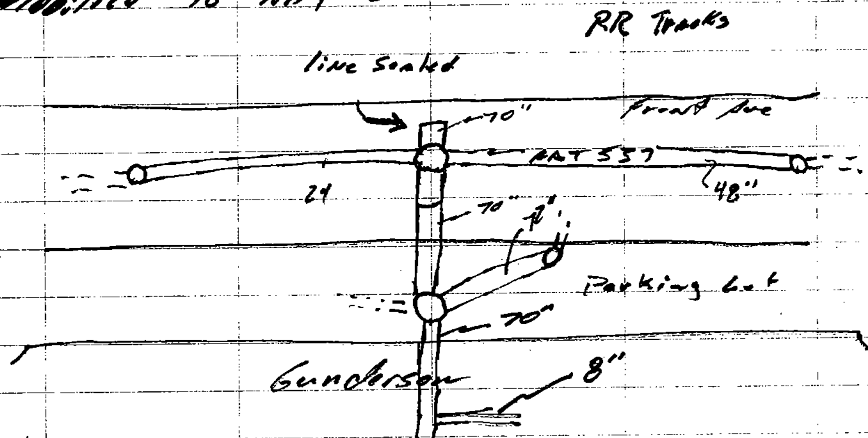
1730 OFF Site.

8-20-03

BES - Source Control In Line Sampling

615 on Site D. Lacey/CH2M, Mike/BES, Derik/BES, Viola/BES
Weather: Sunny, 80°F, Wind Calm
Objective: Collect sample from AAT 537

630 Mobilize to AAT 537



AAT 537 Observations

- Three lines enter at this manhole. A 24" from the Northwest. A 48" from the southeast. A 70" from the southwest. The 70" from the southwest has been abandon. A large concret seal has been installed.

- A small amount of flow was (<1gpm) was observed from the 24" pipe
- A small amount of flow was (<1gpm) was observed from the 48" pipe.
- A layer of solids was observed 1/4 up the pipe approximately 50-feet from the manhole in the 70" pipe.

Mobilize to Gunderson Parking Lot Manhole
- Two large lines enter at this manhole. A 70" which conects to AAT 537. A 70" that jogs to the North to a second manhole in the gunderson parking lot and then appears to run to the southwest across the Rail yard.

- A large (70") pipe exits the manhole. The outfall and river can be observed at this location.
- No sediment in the downstream pipe.
- Sediment at manhole at the confluence of the three pipes.
  - Collected Sample
- No sediment in the New 70" line from the north.
- A small (12") line enters from the south east at the top of the manhole. This line appears to drain a catch basin in the gunderson lot.
- A small 8" pipe enters into the 70" downstream line beside the Gunderson facility.

Sample GN-01 Collected at this location

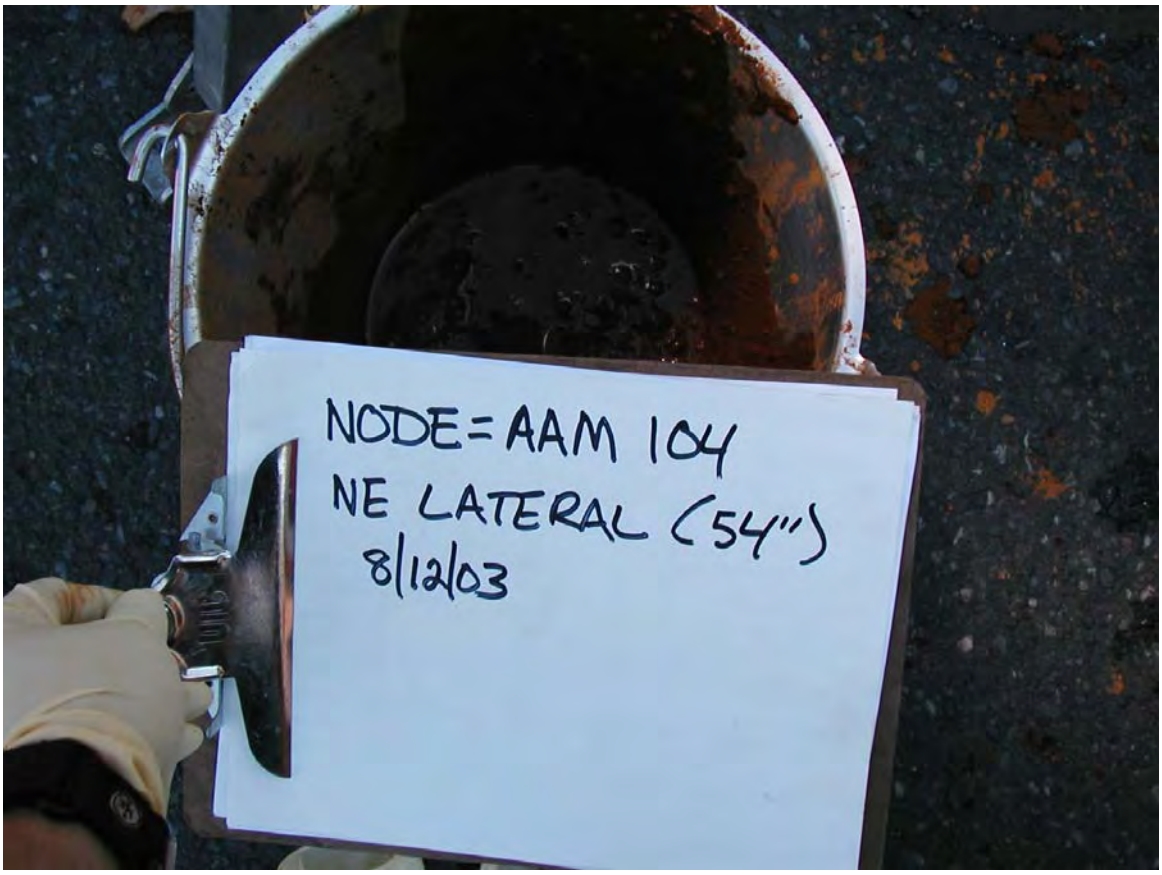
Sample Observations.

- SAND, (SW), wet, brown (with fine layer of Fe oxide deposition) Medium grain.
- No odor
- Sheen observed on pore water.
- Three inches of flowing water in the pipe
- Sediment layer 3' feet long, 1" deep

APPENDIX C
Site Photographs

Photograph 1— Basin M-1: Sample IL-M1-AAM104-0803-SW

Photograph 2— Basin M-1: Sample IL-M1-AAM104-0803-SW



Photograph 3— Basin M-1: Sample IL-M1-AAM104-0803-NE

Photograph 4— Basin M-1: Sample IL-M1-AAM104-0803-NE.

Photograph 5— Basin M-1: Sample IL-M1-AAJ933-0803

Photograph 6— Basin M-1: Sample IL-M1-AAJ933-0803

Photograph 7— Basin M-1: Sample IL-M1-AAM155-0803

Photograph 8— Basin M-1: Sample IL-M1-AAM155-0803

Photograph 9— Basin M-1: Sample IL-M1-AAJ829-0803

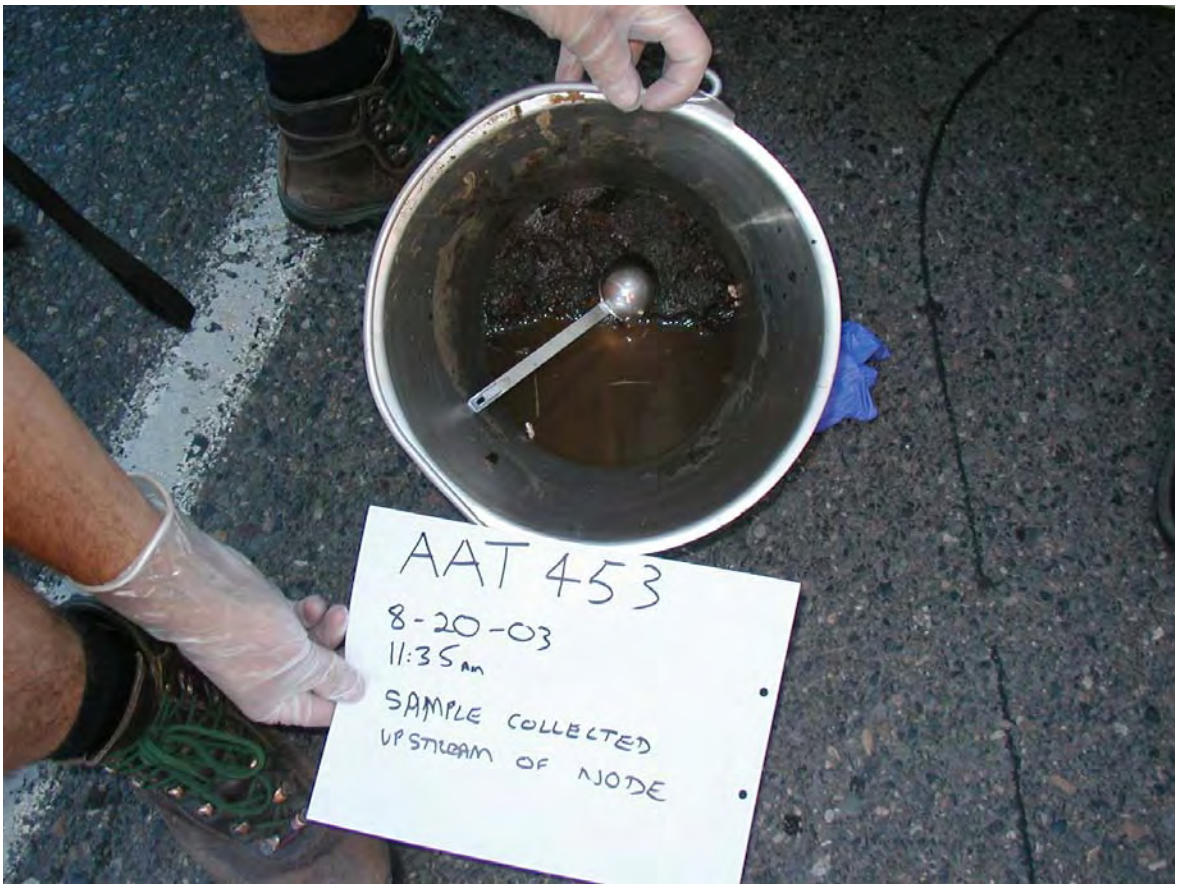
Photograph 10— Basin M-1: Sample IL-M1-AAJ829-0803

Photograph 11—Basin M-1: Sample IL-M1-AAJ831-0803

Photograph 12—Basin M-1: Sample IL-M1-AAJ831-0803

Photograph 13— Basin 18: Sample IL-18-AAT463-0803

Photograph 14— Basin 18: Sample IL-18-AAT463-0803



Photograph 15— Basin 18: Sample IL-18-AAT453-0803

Photograph 16— Basin 18: Node AAT 453

Photograph 17— Basin 18: Sample IL-18-AAT465-0803

Photograph 18— Basin 18: Sample IL-18-AAT465-0803

Photograph 19— Basin 18: Sample IL-18-AAT465-0803

Photograph 20— Basin 18: Sample IL-18-AAT557-0803

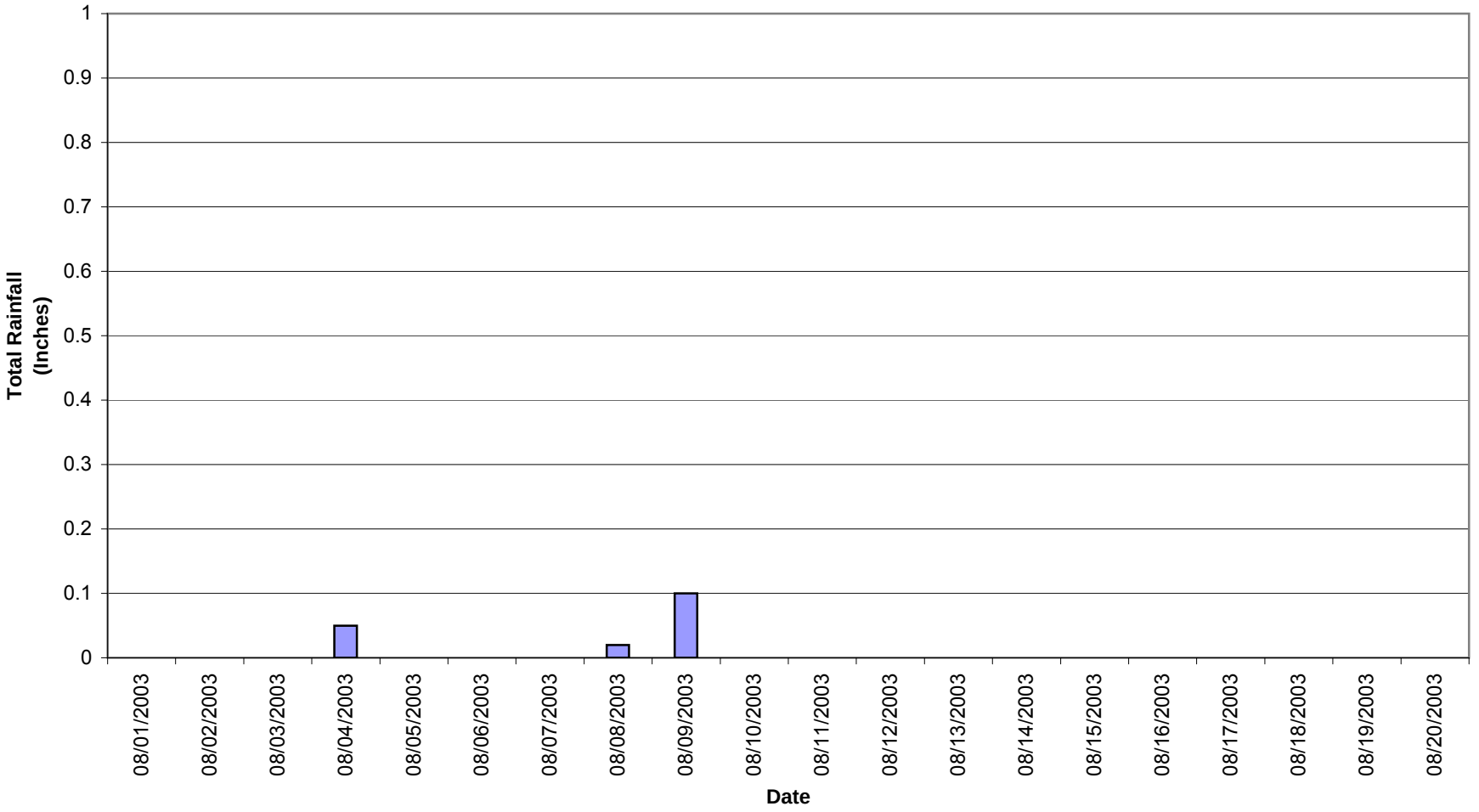
Photograph 21 — Basin 18: Sample IL-18-AAT557-0803

Photograph 22 — Basin 18: Sample IL-18-AAT558-0803

Photograph 23—Basin 18: Sample IL-18-AAT558-0803

APPENDIX D
Daily Rainfall for Portland, Oregon

Figure D-1
Daily Precipitation Portland, Oregon
August 1, 2003 through August 20, 2003



APPENDIX E
Laboratory Data Sheets

PDX/032880007.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: 8/21/03
Page: 1 of 1
Collected By: MJH

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.

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: Pesticides/PCBs*	General: Semi-Volatiles - SIM *	General: TOC*	General: NWTPH-Dx	Metals: Total Metals - EPA 6020 (As, Cu, Cd, Cr, Hg, Pb, Zn)	Metals: Total Metals - EPA 200.8 (As, Cu, Cd, Cr, Pb, Zn)	Metals: Total Mercury - EPA 200.8	Field Comments
FO 030833	IL-18-AAT557-0803 3950 NW Yeon/Univar	18_1	19-Aug-03	1020	C	●	●	●	●	●			
FO 030834	IL-18-AAT465-0803 4033 NW Yeon	18_2	19-Aug-03	1136	C	●	●	●	●	●			
FO 030835	IL-18-AAT558-0803 3900 NW Yeon/Owens C.	18_3	19-Aug-03	1325	C	●	●	●	●	●			
FO 030836	IL-18-AAT463-0803 NWofWestern Wire Works	18_4	19-Aug-03	1439	C	●	●	●	●	●			
FO 030837	IL-18-AAT453-0803 4155 NW Yeon	18_5	20-Aug-03	1140	C	●	●	●	●	●			
FO 030838	IL-18-AAT537-0803 4700 NW Front Ave.	18_6	20-Aug-03	1945	C	●	●	●	●	●			

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: [signature] Time: 1100	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: MICHAEL HAUSER Date: 8-21-03	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature: [signature] Time: 1100	Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Daniel K. VanMeter II Date: 8/21/03	Printed Name: Date:	Printed Name: Date:	Printed Name: Date:

s:\ims\forms\sampling\[File]

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 10:20 **System ID** AH06904 **Sample ID** **FO030833**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT557-0803
3950 NW YEON / UNIVAR

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _1
IMS File/Invoice #: 1020.001

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

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. Duplicate precision was outside the acceptance range for NWTPH-Dx analysis due to the non-homogeneous matrix. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	151	mg/Kg	0.25	EPA 6020
ZINC	374	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	10.5	mg/Kg	0.50	EPA 6020
CADMIUM	14.9	mg/Kg	0.10	EPA 6020
CHROMIUM	188	mg/Kg	0.50	EPA 6020
LEAD	636	mg/Kg	0.10	EPA 6020
MERCURY	0.643	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	555	mg/Kg	500	NWTPH-Dx
DIESEL	<250	mg/Kg	250	NWTPH-Dx
KEROSENE	<250	mg/Kg	250	NWTPH-Dx
MOTOR OIL	3490	mg/Kg	500	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	52900	mg/Kg	127	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	80.4	µg/Kg	2.24	EPA 8081
4,4'-DDE	20.7	µg/Kg	2.24	EPA 8081
4,4'-DDT	284	µg/Kg	22.4	EPA 8081
Aldrin	35.8	µg/Kg	1.12	EPA 8081
Alpha-BHC	<1.12	µg/Kg	1.12	EPA 8081
Alpha-Chlordane	152	µg/Kg	1.12	EPA 8081
Beta-BHC	<1.12	µg/Kg	1.12	EPA 8081
Delta-BHC	25.9	µg/Kg	1.12	EPA 8081
Dieldrin	45.7	µg/Kg	2.24	EPA 8081
Endosulfan I	5.82	µg/Kg	1.12	EPA 8081

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 10:20 **System ID** AH06904 **Sample ID** **FO030833**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT557-0803
3950 NW YEON / UNIVAR

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _1
IMS File/Invoice #: 1020.001

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

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. Duplicate precision was outside the acceptance range for NWTPH-Dx analysis due to the non-homogeneous matrix. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.24	µg/Kg	2.24	EPA 8081
Endosulfan Sulfate	<2.24	µg/Kg	2.24	EPA 8081
Endrin	70.4	µg/Kg	2.24	EPA 8081
Endrin Aldehyde	EST 198	µg/Kg	2.24	EPA 8081
Endrin Ketone	<2.24	µg/Kg	2.24	EPA 8081
Gamma-BHC(Lindane)	1.87	µg/Kg	1.12	EPA 8081
Gamma-Chlordane	512	µg/Kg	1.12	EPA 8081
Heptachlor	3.03	µg/Kg	1.12	EPA 8081
Heptachlor Epoxide	<1.12	µg/Kg	1.12	EPA 8081
Methoxychlor	<112	µg/Kg	112	EPA 8081
PCB 1016	<107	µg/Kg	107	EPA 8081
PCB 1221	<213	µg/Kg	213	EPA 8081
PCB 1232	<107	µg/Kg	107	EPA 8081
PCB 1242	<107	µg/Kg	107	EPA 8081
PCB 1248	<107	µg/Kg	107	EPA 8081
PCB 1254	<107	µg/Kg	107	EPA 8081
PCB 1260	624	µg/Kg	107	EPA 8081
Toxaphene	<112	µg/Kg	112	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<298	µg/Kg	298	EPA 8270 - S
1,2-Dichlorobenzene	<298	µg/Kg	298	EPA 8270 - S
1,3-Dichlorobenzene	<298	µg/Kg	298	EPA 8270 - S
1,4-Dichlorobenzene	<298	µg/Kg	298	EPA 8270 - S
2,4,5-Trichlorophenol	<298	µg/Kg	298	EPA 8270 - S
2,4,6-Trichlorophenol	<298	µg/Kg	298	EPA 8270 - S
2,4-Dichlorophenol	<298	µg/Kg	298	EPA 8270 - S
2,4-Dimethylphenol	<298	µg/Kg	298	EPA 8270 - S
2,4-Dinitrophenol	<1490	µg/Kg	1490	EPA 8270 - S
2,4-Dinitrotoluene	<298	µg/Kg	298	EPA 8270 - S

Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 10:20 **System ID** AH06904 **Sample ID** **FO030833**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT557-0803
3950 NW YEON / UNIVAR

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _1
IMS File/Invoice #: 1020.001

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

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. Duplicate precision was outside the acceptance range for NWTPH-Dx analysis due to the non-homogeneous matrix. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<298	µg/Kg	298	EPA 8270 - S
2-Chloronaphthalene	<74.5	µg/Kg	74.5	EPA 8270 - S
2-Chlorophenol	<298	µg/Kg	298	EPA 8270 - S
2-Methylnaphthalene	355	µg/Kg	74.5	EPA 8270 - S
2-Methylphenol	<298	µg/Kg	298	EPA 8270 - S
2-Nitroaniline	<298	µg/Kg	298	EPA 8270 - S
2-Nitrophenol	<298	µg/Kg	298	EPA 8270 - S
3,3'-Dichlorobenzidine	<596	µg/Kg	596	EPA 8270 - S
3- & 4-Methylphenol	<596	µg/Kg	596	EPA 8270 - S
3-Nitroaniline	<298	µg/Kg	298	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1490	µg/Kg	1490	EPA 8270 - S
4-Bromophenylphenyl ether	<298	µg/Kg	298	EPA 8270 - S
4-Chloro-3-methylphenol	<298	µg/Kg	298	EPA 8270 - S
4-Chloroaniline	<298	µg/Kg	298	EPA 8270 - S
4-Chlorophenylphenyl ether	<298	µg/Kg	298	EPA 8270 - S
4-Nitroaniline	<298	µg/Kg	298	EPA 8270 - S
4-Nitrophenol	<745	µg/Kg	745	EPA 8270 - S
Acenaphthene	<74.5	µg/Kg	74.5	EPA 8270 - S
Acenaphthylene	478	µg/Kg	74.5	EPA 8270 - S
Anthracene	260	µg/Kg	74.5	EPA 8270 - S
Benzo(a)anthracene	<74.5	µg/Kg	74.5	EPA 8270 - S
Benzo(a)pyrene	545	µg/Kg	74.5	EPA 8270 - S
Benzo(g,h,i)perylene	1560	µg/Kg	74.5	EPA 8270 - S
Benzofluoranthenes	796	µg/Kg	74.5	EPA 8270 - S
Benzoic acid	1990	µg/Kg	1490	EPA 8270 - S
Benzyl alcohol	<373	µg/Kg	373	EPA 8270 - S
Benzyl butyl phthalate	<373	µg/Kg	373	EPA 8270 - S
Bis(2-chloroethoxy) methane	<298	µg/Kg	298	EPA 8270 - S
Bis(2-chloroethyl) ether	<298	µg/Kg	298	EPA 8270 - S

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Report Date: 9/16/03

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 10:20 **System ID** AH06904 **Sample ID** **FO030833**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT557-0803
3950 NW YEON / UNIVAR

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _1
IMS File/Invoice #: 1020.001

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

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. Duplicate precision was outside the acceptance range for NWTPH-Dx analysis due to the non-homogeneous matrix. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<298	µg/Kg	298	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<298	µg/Kg	298	EPA 8270 - S
Chrysene	<74.5	µg/Kg	74.5	EPA 8270 - S
Di-n-butyl phthalate	<298	µg/Kg	298	EPA 8270 - S
Di-n-octyl phthalate	<298	µg/Kg	298	EPA 8270 - S
Dibenzo(a,h)anthracene	<74.5	µg/Kg	74.5	EPA 8270 - S
Dibenzofuran	<298	µg/Kg	298	EPA 8270 - S
Diethyl phthalate	<298	µg/Kg	298	EPA 8270 - S
Dimethyl phthalate	<298	µg/Kg	298	EPA 8270 - S
Fluoranthene	656	µg/Kg	74.5	EPA 8270 - S
Fluorene	<74.5	µg/Kg	74.5	EPA 8270 - S
Hexachlorobenzene	<298	µg/Kg	298	EPA 8270 - S
Hexachlorobutadiene	<298	µg/Kg	298	EPA 8270 - S
Hexachlorocyclopentadiene	<298	µg/Kg	298	EPA 8270 - S
Hexachloroethane	<298	µg/Kg	298	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	1030	µg/Kg	74.5	EPA 8270 - S
Isophorone	<298	µg/Kg	298	EPA 8270 - S
N-Nitrosodi-n-propylamine	<298	µg/Kg	298	EPA 8270 - S
N-Nitrosodiphenylamine	<298	µg/Kg	298	EPA 8270 - S
Naphthalene	147	µg/Kg	74.5	EPA 8270 - S
Nitrobenzene	<298	µg/Kg	298	EPA 8270 - S
Pentachlorophenol	<298	µg/Kg	298	EPA 8270 - S
Phenanthrene	445	µg/Kg	74.5	EPA 8270 - S
Phenol	<298	µg/Kg	298	EPA 8270 - S
Pyrene	964	µg/Kg	74.5	EPA 8270 - S

End of Report for Sample ID: FO030833

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Report Date: 9/16/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 11:36 **System ID** AH06905 **Sample ID** **FO030834**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT465-0803
4033 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _2
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	139	mg/Kg	0.25	EPA 6020
ZINC	268	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	5.14	mg/Kg	0.50	EPA 6020
CADMIUM	0.93	mg/Kg	0.10	EPA 6020
CHROMIUM	83.0	mg/Kg	0.50	EPA 6020
LEAD	18.9	mg/Kg	0.10	EPA 6020
MERCURY	0.022	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<250	mg/Kg	250	NWTPH-Dx
DIESEL	<125	mg/Kg	125	NWTPH-Dx
KEROSENE	<125	mg/Kg	125	NWTPH-Dx
MOTOR OIL	679	mg/Kg	250	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	5530	mg/Kg	87.7	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<2.53	µg/Kg	2.53	EPA 8081
4,4'-DDE	<2.53	µg/Kg	2.53	EPA 8081
4,4'-DDT	<25.3	µg/Kg	25.3	EPA 8081
Aldrin	<12.7	µg/Kg	12.7	EPA 8081
Alpha-BHC	<1.27	µg/Kg	1.27	EPA 8081
Alpha-Chlordane	<1.27	µg/Kg	1.27	EPA 8081
Beta-BHC	<1.27	µg/Kg	1.27	EPA 8081
Delta-BHC	<1.27	µg/Kg	1.27	EPA 8081
Dieldrin	<2.53	µg/Kg	2.53	EPA 8081
Endosulfan I	<1.27	µg/Kg	1.27	EPA 8081

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 11:36 **System ID** AH06905 **Sample ID** **FO030834**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT465-0803
4033 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _2
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.53	µg/Kg	2.53	EPA 8081
Endosulfan Sulfate	<2.53	µg/Kg	2.53	EPA 8081
Endrin	<2.53	µg/Kg	2.53	EPA 8081
Endrin Aldehyde	<2.53	µg/Kg	2.53	EPA 8081
Endrin Ketone	<2.53	µg/Kg	2.53	EPA 8081
Gamma-BHC(Lindane)	<1.27	µg/Kg	1.27	EPA 8081
Gamma-Chlordane	<1.27	µg/Kg	1.27	EPA 8081
Heptachlor	<1.27	µg/Kg	1.27	EPA 8081
Heptachlor Epoxide	<1.27	µg/Kg	1.27	EPA 8081
Methoxychlor	<127	µg/Kg	127	EPA 8081
PCB 1016	<122	µg/Kg	122	EPA 8081
PCB 1221	<244	µg/Kg	244	EPA 8081
PCB 1232	<122	µg/Kg	122	EPA 8081
PCB 1242	<122	µg/Kg	122	EPA 8081
PCB 1248	<122	µg/Kg	122	EPA 8081
PCB 1254	<122	µg/Kg	122	EPA 8081
PCB 1260	<122	µg/Kg	122	EPA 8081
Toxaphene	<127	µg/Kg	127	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<347	µg/Kg	347	EPA 8270 - S
1,2-Dichlorobenzene	<347	µg/Kg	347	EPA 8270 - S
1,3-Dichlorobenzene	<347	µg/Kg	347	EPA 8270 - S
1,4-Dichlorobenzene	<347	µg/Kg	347	EPA 8270 - S
2,4,5-Trichlorophenol	<347	µg/Kg	347	EPA 8270 - S
2,4,6-Trichlorophenol	<347	µg/Kg	347	EPA 8270 - S
2,4-Dichlorophenol	<347	µg/Kg	347	EPA 8270 - S
2,4-Dimethylphenol	<347	µg/Kg	347	EPA 8270 - S
2,4-Dinitrophenol	<1730	µg/Kg	1730	EPA 8270 - S
2,4-Dinitrotoluene	<347	µg/Kg	347	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 11:36 **System ID** AH06905 **Sample ID** **FO030834**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT465-0803
4033 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _2
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<347	µg/Kg	347	EPA 8270 - S
2-Chloronaphthalene	<86.7	µg/Kg	86.7	EPA 8270 - S
2-Chlorophenol	<347	µg/Kg	347	EPA 8270 - S
2-Methylnaphthalene	<86.7	µg/Kg	86.7	EPA 8270 - S
2-Methylphenol	<347	µg/Kg	347	EPA 8270 - S
2-Nitroaniline	<347	µg/Kg	347	EPA 8270 - S
2-Nitrophenol	<347	µg/Kg	347	EPA 8270 - S
3,3'-Dichlorobenzidine	<694	µg/Kg	694	EPA 8270 - S
3- & 4-Methylphenol	823	µg/Kg	694	EPA 8270 - S
3-Nitroaniline	<347	µg/Kg	347	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1730	µg/Kg	1730	EPA 8270 - S
4-Bromophenylphenyl ether	<347	µg/Kg	347	EPA 8270 - S
4-Chloro-3-methylphenol	<347	µg/Kg	347	EPA 8270 - S
4-Chloroaniline	<347	µg/Kg	347	EPA 8270 - S
4-Chlorophenylphenyl ether	<347	µg/Kg	347	EPA 8270 - S
4-Nitroaniline	<347	µg/Kg	347	EPA 8270 - S
4-Nitrophenol	<867	µg/Kg	867	EPA 8270 - S
Acenaphthene	<86.7	µg/Kg	86.8	EPA 8270 - S
Acenaphthylene	<86.7	µg/Kg	86.7	EPA 8270 - S
Anthracene	<86.7	µg/Kg	86.7	EPA 8270 - S
Benzo(a)anthracene	<86.7	µg/Kg	86.7	EPA 8270 - S
Benzo(a)pyrene	<86.7	µg/Kg	86.7	EPA 8270 - S
Benzo(g,h,i)perylene	<86.7	µg/Kg	86.7	EPA 8270 - S
Benzofluoranthenes	<86.7	µg/Kg	86.7	EPA 8270 - S
Benzoic acid	<1730	µg/Kg	1730	EPA 8270 - S
Benzyl alcohol	<434	µg/Kg	434	EPA 8270 - S
Benzyl butyl phthalate	<434	µg/Kg	434	EPA 8270 - S
Bis(2-chloroethoxy) methane	<347	µg/Kg	347	EPA 8270 - S
Bis(2-chloroethyl) ether	<347	µg/Kg	347	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 11:36 **System ID** AH06905 **Sample ID** **FO030834**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT465-0803
4033 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _2
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<347	µg/Kg	347	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	990	µg/Kg	347	EPA 8270 - S
Chrysene	<86.7	µg/Kg	86.7	EPA 8270 - S
Di-n-butyl phthalate	<347	µg/Kg	347	EPA 8270 - S
Di-n-octyl phthalate	<347	µg/Kg	347	EPA 8270 - S
Dibenzo(a,h)anthracene	<86.7	µg/Kg	86.7	EPA 8270 - S
Dibenzofuran	<347	µg/Kg	347	EPA 8270 - S
Diethyl phthalate	<347	µg/Kg	347	EPA 8270 - S
Dimethyl phthalate	<347	µg/Kg	347	EPA 8270 - S
Fluoranthene	<86.7	µg/Kg	86.7	EPA 8270 - S
Fluorene	<86.7	µg/Kg	86.7	EPA 8270 - S
Hexachlorobenzene	<347	µg/Kg	347	EPA 8270 - S
Hexachlorobutadiene	<347	µg/Kg	347	EPA 8270 - S
Hexachlorocyclopentadiene	<347	µg/Kg	347	EPA 8270 - S
Hexachloroethane	<347	µg/Kg	347	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<86.7	µg/Kg	86.7	EPA 8270 - S
Isophorone	<347	µg/Kg	347	EPA 8270 - S
N-Nitrosodi-n-propylamine	<347	µg/Kg	347	EPA 8270 - S
N-Nitrosodiphenylamine	<347	µg/Kg	347	EPA 8270 - S
Naphthalene	<86.7	µg/Kg	86.7	EPA 8270 - S
Nitrobenzene	<347	µg/Kg	347	EPA 8270 - S
Pentachlorophenol	<347	µg/Kg	347	EPA 8270 - S
Phenanthrene	<86.7	µg/Kg	86.7	EPA 8270 - S
Phenol	<347	µg/Kg	347	EPA 8270 - S
Pyrene	<86.7	µg/Kg	86.7	EPA 8270 - S

End of Report for Sample ID: FO030834

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Report Date: 9/16/03

Validated By: Signature on File

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 13:25 **System ID** AH06906 **Sample ID** **FO030835**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT558-0803
3900 NW YEON / OWENS C

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _3
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	87.6	mg/Kg	0.25	EPA 6020
ZINC	416	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	4.24	mg/Kg	0.50	EPA 6020
CADMIUM	0.77	mg/Kg	0.10	EPA 6020
CHROMIUM	104	mg/Kg	0.50	EPA 6020
LEAD	21.5	mg/Kg	0.10	EPA 6020
MERCURY	0.031	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<250	mg/Kg	250	NWTPH-Dx
DIESEL	<125	mg/Kg	125	NWTPH-Dx
KEROSENE	<125	mg/Kg	125	NWTPH-Dx
MOTOR OIL	786	mg/Kg	250	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	8030	mg/Kg	87.2	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<2.61	µg/Kg	2.61	EPA 8081
4,4'-DDE	<2.61	µg/Kg	2.61	EPA 8081
4,4'-DDT	<26.1	µg/Kg	26.1	EPA 8081
Aldrin	<1.3	µg/Kg	1.3	EPA 8081
Alpha-BHC	<1.3	µg/Kg	1.3	EPA 8081
Alpha-Chlordane	<1.3	µg/Kg	1.3	EPA 8081
Beta-BHC	<1.3	µg/Kg	1.3	EPA 8081
Delta-BHC	<1.3	µg/Kg	1.3	EPA 8081
Dieldrin	<2.61	µg/Kg	2.61	EPA 8081
Endosulfan I	<1.3	µg/Kg	1.3	EPA 8081

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Report Date: 9/16/03

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 13:25 **System ID** AH06906 **Sample ID** **FO030835**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT558-0803
3900 NW YEON / OWENS C

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _3
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.61	µg/Kg	2.61	EPA 8081
Endosulfan Sulfate	<2.61	µg/Kg	2.61	EPA 8081
Endrin	<2.61	µg/Kg	2.61	EPA 8081
Endrin Aldehyde	<2.61	µg/Kg	2.61	EPA 8081
Endrin Ketone	<2.61	µg/Kg	2.61	EPA 8081
Gamma-BHC(Lindane)	<1.3	µg/Kg	1.3	EPA 8081
Gamma-Chlordane	<1.3	µg/Kg	1.3	EPA 8081
Heptachlor	<1.3	µg/Kg	1.3	EPA 8081
Heptachlor Epoxide	<1.3	µg/Kg	1.3	EPA 8081
Methoxychlor	<130	µg/Kg	130	EPA 8081
PCB 1016	<132	µg/Kg	132	EPA 8081
PCB 1221	<265	µg/Kg	265	EPA 8081
PCB 1232	<132	µg/Kg	132	EPA 8081
PCB 1242	<132	µg/Kg	132	EPA 8081
PCB 1248	<132	µg/Kg	132	EPA 8081
PCB 1254	<132	µg/Kg	132	EPA 8081
PCB 1260	<132	µg/Kg	132	EPA 8081
Toxaphene	<130	µg/Kg	130	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<354	µg/Kg	354	EPA 8270 - S
1,2-Dichlorobenzene	<354	µg/Kg	354	EPA 8270 - S
1,3-Dichlorobenzene	<354	µg/Kg	354	EPA 8270 - S
1,4-Dichlorobenzene	<354	µg/Kg	354	EPA 8270 - S
2,4,5-Trichlorophenol	<354	µg/Kg	354	EPA 8270 - S
2,4,6-Trichlorophenol	<354	µg/Kg	354	EPA 8270 - S
2,4-Dichlorophenol	<354	µg/Kg	354	EPA 8270 - S
2,4-Dimethylphenol	<354	µg/Kg	354	EPA 8270 - S
2,4-Dinitrophenol	<1770	µg/Kg	1770	EPA 8270 - S
2,4-Dinitrotoluene	<354	µg/Kg	354	EPA 8270 - S

Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 13:25 **System ID** AH06906 **Sample ID** **FO030835**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT558-0803
3900 NW YEON / OWENS C

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _3
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<354	µg/Kg	354	EPA 8270 - S
2-Chloronaphthalene	<88.4	µg/Kg	88.4	EPA 8270 - S
2-Chlorophenol	<354	µg/Kg	354	EPA 8270 - S
2-Methylnaphthalene	<88.4	µg/Kg	88.4	EPA 8270 - S
2-Methylphenol	<354	µg/Kg	354	EPA 8270 - S
2-Nitroaniline	<354	µg/Kg	354	EPA 8270 - S
2-Nitrophenol	<354	µg/Kg	354	EPA 8270 - S
3,3'-Dichlorobenzidine	<707	µg/Kg	707	EPA 8270 - S
3- & 4-Methylphenol	<708	µg/Kg	708	EPA 8270 - S
3-Nitroaniline	<354	µg/Kg	354	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1770	µg/Kg	1770	EPA 8270 - S
4-Bromophenylphenyl ether	<354	µg/Kg	354	EPA 8270 - S
4-Chloro-3-methylphenol	<354	µg/Kg	354	EPA 8270 - S
4-Chloroaniline	<354	µg/Kg	354	EPA 8270 - S
4-Chlorophenylphenyl ether	<354	µg/Kg	354	EPA 8270 - S
4-Nitroaniline	<354	µg/Kg	354	EPA 8270 - S
4-Nitrophenol	<884	µg/Kg	884	EPA 8270 - S
Acenaphthene	<88.4	µg/Kg	88.4	EPA 8270 - S
Acenaphthylene	<88.4	µg/Kg	88.4	EPA 8270 - S
Anthracene	<88.4	µg/Kg	88.4	EPA 8270 - S
Benzo(a)anthracene	<88.4	µg/Kg	88.4	EPA 8270 - S
Benzo(a)pyrene	217	µg/Kg	88.4	EPA 8270 - S
Benzo(g,h,i)perylene	338	µg/Kg	88.4	EPA 8270 - S
Benzofluoranthenes	323	µg/Kg	88.4	EPA 8270 - S
Benzoic acid	<1770	µg/Kg	1770	EPA 8270 - S
Benzyl alcohol	<442	µg/Kg	442	EPA 8270 - S
Benzyl butyl phthalate	1040	µg/Kg	442	EPA 8270 - S
Bis(2-chloroethoxy) methane	<354	µg/Kg	354	EPA 8270 - S
Bis(2-chloroethyl) ether	<354	µg/Kg	354	EPA 8270 - S

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Report Date: 9/16/03

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Laboratory Analysis Report

Sample Date/Time 8/19/03 13:25 **System ID** AH06906 **Sample ID** **FO030835**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT558-0803
3900 NW YEON / OWENS C

Page: 4
Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _3
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<354	µg/Kg	354	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	917	µg/Kg	354	EPA 8270 - S
Chrysene	<88.4	µg/Kg	88.4	EPA 8270 - S
Di-n-butyl phthalate	<354	µg/Kg	354	EPA 8270 - S
Di-n-octyl phthalate	<354	µg/Kg	354	EPA 8270 - S
Dibenzo(a,h)anthracene	<88.4	µg/Kg	88.4	EPA 8270 - S
Dibenzofuran	<354	µg/Kg	354	EPA 8270 - S
Diethyl phthalate	<354	µg/Kg	354	EPA 8270 - S
Dimethyl phthalate	<354	µg/Kg	354	EPA 8270 - S
Fluoranthene	218	µg/Kg	88.4	EPA 8270 - S
Fluorene	<88.4	µg/Kg	88.4	EPA 8270 - S
Hexachlorobenzene	<354	µg/Kg	354	EPA 8270 - S
Hexachlorobutadiene	<354	µg/Kg	354	EPA 8270 - S
Hexachlorocyclopentadiene	<354	µg/Kg	354	EPA 8270 - S
Hexachloroethane	<354	µg/Kg	354	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	201	µg/Kg	88.4	EPA 8270 - S
Isophorone	<354	µg/Kg	354	EPA 8270 - S
N-Nitrosodi-n-propylamine	<354	µg/Kg	354	EPA 8270 - S
N-Nitrosodiphenylamine	<354	µg/Kg	354	EPA 8270 - S
Naphthalene	<88.4	µg/Kg	88.4	EPA 8270 - S
Nitrobenzene	<354	µg/Kg	354	EPA 8270 - S
Pentachlorophenol	<354	µg/Kg	354	EPA 8270 - S
Phenanthrene	143	µg/Kg	88.4	EPA 8270 - S
Phenol	<354	µg/Kg	354	EPA 8270 - S
Pyrene	190	µg/Kg	88.4	EPA 8270 - S

End of Report for Sample ID: FO030835

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 14:39 **System ID** AH06907 **Sample ID** **FO030836**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT463-0803
NW OF WESTERN WIRE WORKS

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _4
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	53.5	mg/Kg	0.25	EPA 6020
ZINC	193	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	2.99	mg/Kg	0.50	EPA 6020
CADMIUM	0.43	mg/Kg	0.10	EPA 6020
CHROMIUM	77.0	mg/Kg	0.50	EPA 6020
LEAD	77.8	mg/Kg	0.10	EPA 6020
MERCURY	0.149	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<250	mg/Kg	250	NWTPH-Dx
DIESEL	<125	mg/Kg	125	NWTPH-Dx
KEROSENE	<125	mg/Kg	125	NWTPH-Dx
MOTOR OIL	1330	mg/Kg	250	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	13300	mg/Kg	87.2	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	11.9	µg/Kg	2.47	EPA 8081
4,4'-DDE	20.7	µg/Kg	2.47	EPA 8081
4,4'-DDT	<24.7	µg/Kg	24.7	EPA 8081
Aldrin	9.09	µg/Kg	1.24	EPA 8081
Alpha-BHC	<1.24	µg/Kg	1.24	EPA 8081
Alpha-Chlordane	9.14	µg/Kg	1.24	EPA 8081
Beta-BHC	<1.24	µg/Kg	1.24	EPA 8081
Delta-BHC	3.54	µg/Kg	1.24	EPA 8081
Dieldrin	13.9	µg/Kg	2.47	EPA 8081
Endosulfan I	<1.24	µg/Kg	1.24	EPA 8081

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 14:39 **System ID** AH06907 **Sample ID** **FO030836**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT463-0803
NW OF WESTERN WIRE WORKS

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _4
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.47	µg/Kg	2.47	EPA 8081
Endosulfan Sulfate	<2.47	µg/Kg	2.47	EPA 8081
Endrin	<2.47	µg/Kg	2.47	EPA 8081
Endrin Aldehyde	<2.47	µg/Kg	2.47	EPA 8081
Endrin Ketone	<2.47	µg/Kg	2.47	EPA 8081
Gamma-BHC(Lindane)	<1.24	µg/Kg	1.24	EPA 8081
Gamma-Chlordane	9.95	µg/Kg	1.24	EPA 8081
Heptachlor	<1.24	µg/Kg	1.24	EPA 8081
Heptachlor Epoxide	<1.24	µg/Kg	1.24	EPA 8081
Methoxychlor	<124	µg/Kg	124	EPA 8081
PCB 1016	<127	µg/Kg	127	EPA 8081
PCB 1221	<254	µg/Kg	254	EPA 8081
PCB 1232	<127	µg/Kg	127	EPA 8081
PCB 1242	<127	µg/Kg	127	EPA 8081
PCB 1248	<127	µg/Kg	127	EPA 8081
PCB 1254	187	µg/Kg	127	EPA 8081
PCB 1260	<127	µg/Kg	127	EPA 8081
Toxaphene	<124	µg/Kg	124	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<328	µg/Kg	328	EPA 8270 - S
1,2-Dichlorobenzene	<328	µg/Kg	328	EPA 8270 - S
1,3-Dichlorobenzene	<328	µg/Kg	328	EPA 8270 - S
1,4-Dichlorobenzene	<328	µg/Kg	328	EPA 8270 - S
2,4,5-Trichlorophenol	<328	µg/Kg	328	EPA 8270 - S
2,4,6-Trichlorophenol	<328	µg/Kg	328	EPA 8270 - S
2,4-Dichlorophenol	<328	µg/Kg	328	EPA 8270 - S
2,4-Dimethylphenol	<328	µg/Kg	328	EPA 8270 - S
2,4-Dinitrophenol	<1640	µg/Kg	1640	EPA 8270 - S
2,4-Dinitrotoluene	<328	µg/Kg	328	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 14:39 **System ID** AH06907 **Sample ID** **FO030836**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT463-0803
NW OF WESTERN WIRE WORKS

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _4
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<328	µg/Kg	328	EPA 8270 - S
2-Chloronaphthalene	<81.9	µg/Kg	81.9	EPA 8270 - S
2-Chlorophenol	<328	µg/Kg	328	EPA 8270 - S
2-Methylnaphthalene	<81.9	µg/Kg	81.9	EPA 8270 - S
2-Methylphenol	<328	µg/Kg	328	EPA 8270 - S
2-Nitroaniline	<328	µg/Kg	328	EPA 8270 - S
2-Nitrophenol	<328	µg/Kg	328	EPA 8270 - S
3,3'-Dichlorobenzidine	<655	µg/Kg	655	EPA 8270 - S
3- & 4-Methylphenol	<655	µg/Kg	655	EPA 8270 - S
3-Nitroaniline	<328	µg/Kg	328	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1640	µg/Kg	1640	EPA 8270 - S
4-Bromophenylphenyl ether	<328	µg/Kg	328	EPA 8270 - S
4-Chloro-3-methylphenol	<328	µg/Kg	328	EPA 8270 - S
4-Chloroaniline	<328	µg/Kg	328	EPA 8270 - S
4-Chlorophenylphenyl ether	<328	µg/Kg	328	EPA 8270 - S
4-Nitroaniline	<328	µg/Kg	328	EPA 8270 - S
4-Nitrophenol	<819	µg/Kg	819	EPA 8270 - S
Acenaphthene	<81.9	µg/Kg	81.9	EPA 8270 - S
Acenaphthylene	<81.9	µg/Kg	81.9	EPA 8270 - S
Anthracene	<81.9	µg/Kg	81.9	EPA 8270 - S
Benzo(a)anthracene	<81.9	µg/Kg	81.9	EPA 8270 - S
Benzo(a)pyrene	<81.9	µg/Kg	81.9	EPA 8270 - S
Benzo(g,h,i)perylene	<81.9	µg/Kg	81.9	EPA 8270 - S
Benzofluoranthenes	<81.9	µg/Kg	81.9	EPA 8270 - S
Benzoic acid	<1640	µg/Kg	1640	EPA 8270 - S
Benzyl alcohol	<410	µg/Kg	410	EPA 8270 - S
Benzyl butyl phthalate	<410	µg/Kg	410	EPA 8270 - S
Bis(2-chloroethoxy) methane	<328	µg/Kg	328	EPA 8270 - S
Bis(2-chloroethyl) ether	<328	µg/Kg	328	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/19/03 14:39 **System ID** AH06907 **Sample ID** **FO030836**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT463-0803
NW OF WESTERN WIRE WORKS

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _4
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<328	µg/Kg	328	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1020	µg/Kg	328	EPA 8270 - S
Chrysene	<81.9	µg/Kg	81.9	EPA 8270 - S
Di-n-butyl phthalate	<328	µg/Kg	328	EPA 8270 - S
Di-n-octyl phthalate	<328	µg/Kg	328	EPA 8270 - S
Dibenzo(a,h)anthracene	<81.9	µg/Kg	81.9	EPA 8270 - S
Dibenzofuran	<328	µg/Kg	328	EPA 8270 - S
Diethyl phthalate	<328	µg/Kg	328	EPA 8270 - S
Dimethyl phthalate	<328	µg/Kg	328	EPA 8270 - S
Fluoranthene	196	µg/Kg	81.9	EPA 8270 - S
Fluorene	<81.9	µg/Kg	81.9	EPA 8270 - S
Hexachlorobenzene	<328	µg/Kg	328	EPA 8270 - S
Hexachlorobutadiene	<328	µg/Kg	328	EPA 8270 - S
Hexachlorocyclopentadiene	<328	µg/Kg	328	EPA 8270 - S
Hexachloroethane	<328	µg/Kg	328	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<81.9	µg/Kg	81.9	EPA 8270 - S
Isophorone	<328	µg/Kg	328	EPA 8270 - S
N-Nitrosodi-n-propylamine	<328	µg/Kg	328	EPA 8270 - S
N-Nitrosodiphenylamine	<328	µg/Kg	328	EPA 8270 - S
Naphthalene	<81.9	µg/Kg	81.9	EPA 8270 - S
Nitrobenzene	<328	µg/Kg	328	EPA 8270 - S
Pentachlorophenol	<328	µg/Kg	328	EPA 8270 - S
Phenanthrene	168	µg/Kg	81.9	EPA 8270 - S
Phenol	<328	µg/Kg	328	EPA 8270 - S
Pyrene	231	µg/Kg	81.9	EPA 8270 - S

End of Report for Sample ID: FO030836

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 11:40 **System ID** AH06908 **Sample ID** **FO030837**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT453-0803
4155 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _5
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	185	mg/Kg	0.25	EPA 6020
ZINC	201	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	13.1	mg/Kg	0.50	EPA 6020
CADMIUM	0.54	mg/Kg	0.10	EPA 6020
CHROMIUM	59.8	mg/Kg	0.50	EPA 6020
LEAD	77.9	mg/Kg	0.10	EPA 6020
MERCURY	0.035	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<250	mg/Kg	250	NWTPH-Dx
DIESEL	<125	mg/Kg	125	NWTPH-Dx
KEROSENE	<125	mg/Kg	125	NWTPH-Dx
MOTOR OIL	442	mg/Kg	250	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	6700	mg/Kg	93.2	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<2.5	µg/Kg	2.5	EPA 8081
4,4'-DDE	<2.5	µg/Kg	2.5	EPA 8081
4,4'-DDT	<25	µg/Kg	25	EPA 8081
Aldrin	<1.25	µg/Kg	1.25	EPA 8081
Alpha-BHC	<1.25	µg/Kg	1.25	EPA 8081
Alpha-Chlordane	<1.25	µg/Kg	1.25	EPA 8081
Beta-BHC	<1.25	µg/Kg	1.25	EPA 8081
Delta-BHC	<1.25	µg/Kg	1.25	EPA 8081
Dieldrin	4.77	µg/Kg	2.25	EPA 8081
Endosulfan I	<1.25	µg/Kg	1.25	EPA 8081

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Report Date: 9/16/03

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 11:40 **System ID** AH06908 **Sample ID** **FO030837**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT453-0803
4155 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _5
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.5	µg/Kg	2.5	EPA 8081
Endosulfan Sulfate	<2.5	µg/Kg	2.5	EPA 8081
Endrin	<2.5	µg/Kg	2.5	EPA 8081
Endrin Aldehyde	<2.5	µg/Kg	2.5	EPA 8081
Endrin Ketone	<2.5	µg/Kg	2.5	EPA 8081
Gamma-BHC(Lindane)	<1.25	µg/Kg	1.25	EPA 8081
Gamma-Chlordane	<1.25	µg/Kg	1.25	EPA 8081
Heptachlor	<1.25	µg/Kg	1.25	EPA 8081
Heptachlor Epoxide	<1.25	µg/Kg	1.25	EPA 8081
Methoxychlor	<125	µg/Kg	125	EPA 8081
PCB 1016	<127	µg/Kg	127	EPA 8081
PCB 1221	<253	µg/Kg	253	EPA 8081
PCB 1232	<127	µg/Kg	127	EPA 8081
PCB 1242	<127	µg/Kg	127	EPA 8081
PCB 1248	<127	µg/Kg	127	EPA 8081
PCB 1254	<127	µg/Kg	127	EPA 8081
PCB 1260	<127	µg/Kg	127	EPA 8081
Toxaphene	<125	µg/Kg	125	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<338	µg/Kg	338	EPA 8270 - S
1,2-Dichlorobenzene	<338	µg/Kg	338	EPA 8270 - S
1,3-Dichlorobenzene	<338	µg/Kg	338	EPA 8270 - S
1,4-Dichlorobenzene	<338	µg/Kg	338	EPA 8270 - S
2,4,5-Trichlorophenol	<338	µg/Kg	338	EPA 8270 - S
2,4,6-Trichlorophenol	<338	µg/Kg	338	EPA 8270 - S
2,4-Dichlorophenol	<338	µg/Kg	338	EPA 8270 - S
2,4-Dimethylphenol	<338	µg/Kg	338	EPA 8270 - S
2,4-Dinitrophenol	<1690	µg/Kg	1690	EPA 8270 - S
2,4-Dinitrotoluene	<338	µg/Kg	338	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 11:40 **System ID** AH06908 **Sample ID** **FO030837**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT453-0803
4155 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _5
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<338	µg/Kg	338	EPA 8270 - S
2-Chloronaphthalene	<84.5	µg/Kg	84.5	EPA 8270 - S
2-Chlorophenol	<338	µg/Kg	338	EPA 8270 - S
2-Methylnaphthalene	<84.5	µg/Kg	84.5	EPA 8270 - S
2-Methylphenol	<338	µg/Kg	338	EPA 8270 - S
2-Nitroaniline	<338	µg/Kg	338	EPA 8270 - S
2-Nitrophenol	<338	µg/Kg	338	EPA 8270 - S
3,3'-Dichlorobenzidine	<676	µg/Kg	676	EPA 8270 - S
3- & 4-Methylphenol	<676	µg/Kg	676	EPA 8270 - S
3-Nitroaniline	<338	µg/Kg	338	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1690	µg/Kg	1690	EPA 8270 - S
4-Bromophenylphenyl ether	<338	µg/Kg	338	EPA 8270 - S
4-Chloro-3-methylphenol	<338	µg/Kg	338	EPA 8270 - S
4-Chloroaniline	<338	µg/Kg	338	EPA 8270 - S
4-Chlorophenylphenyl ether	<338	µg/Kg	338	EPA 8270 - S
4-Nitroaniline	<338	µg/Kg	338	EPA 8270 - S
4-Nitrophenol	<845	µg/Kg	845	EPA 8270 - S
Acenaphthene	<84.5	µg/Kg	84.5	EPA 8270 - S
Acenaphthylene	<84.5	µg/Kg	84.5	EPA 8270 - S
Anthracene	<84.5	µg/Kg	84.5	EPA 8270 - S
Benzo(a)anthracene	<84.5	µg/Kg	84.5	EPA 8270 - S
Benzo(a)pyrene	<84.5	µg/Kg	84.5	EPA 8270 - S
Benzo(g,h,i)perylene	<84.5	µg/Kg	84.5	EPA 8270 - S
Benzofluoranthenes	<84.5	µg/Kg	84.5	EPA 8270 - S
Benzoic acid	<1690	µg/Kg	1690	EPA 8270 - S
Benzyl alcohol	<422	µg/Kg	422	EPA 8270 - S
Benzyl butyl phthalate	<422	µg/Kg	422	EPA 8270 - S
Bis(2-chloroethoxy) methane	<338	µg/Kg	338	EPA 8270 - S
Bis(2-chloroethyl) ether	<338	µg/Kg	338	EPA 8270 - S

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Laboratory Analysis Report

Sample Date/Time 8/20/03 11:40 **System ID** AH06908 **Sample ID** **FO030837**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT453-0803
4155 NW YEON

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _5
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<338	µg/Kg	338	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	576	µg/Kg	338	EPA 8270 - S
Chrysene	<84.5	µg/Kg	84.5	EPA 8270 - S
Di-n-butyl phthalate	<338	µg/Kg	338	EPA 8270 - S
Di-n-octyl phthalate	<338	µg/Kg	338	EPA 8270 - S
Dibenzo(a,h)anthracene	<84.5	µg/Kg	84.5	EPA 8270 - S
Dibenzofuran	<338	µg/Kg	338	EPA 8270 - S
Diethyl phthalate	<338	µg/Kg	338	EPA 8270 - S
Dimethyl phthalate	<338	µg/Kg	338	EPA 8270 - S
Fluoranthene	134	µg/Kg	84.5	EPA 8270 - S
Fluorene	<84.5	µg/Kg	84.5	EPA 8270 - S
Hexachlorobenzene	<338	µg/Kg	338	EPA 8270 - S
Hexachlorobutadiene	<338	µg/Kg	338	EPA 8270 - S
Hexachlorocyclopentadiene	<338	µg/Kg	338	EPA 8270 - S
Hexachloroethane	<338	µg/Kg	338	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<84.5	µg/Kg	84.5	EPA 8270 - S
Isophorone	<338	µg/Kg	338	EPA 8270 - S
N-Nitrosodi-n-propylamine	<338	µg/Kg	338	EPA 8270 - S
N-Nitrosodiphenylamine	<338	µg/Kg	338	EPA 8270 - S
Naphthalene	<84.5	µg/Kg	84.5	EPA 8270 - S
Nitrobenzene	<338	µg/Kg	338	EPA 8270 - S
Pentachlorophenol	<338	µg/Kg	338	EPA 8270 - S
Phenanthrene	<84.5	µg/Kg	84.5	EPA 8270 - S
Phenol	<338	µg/Kg	338	EPA 8270 - S
Pyrene	195	µg/Kg	84.5	EPA 8270 - S

End of Report for Sample ID: FO030837

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Report Date: 9/16/03

Validated By: Signature on File

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 19:45 **System ID** AH06909 **Sample ID** **FO030838**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT537-0803
4700 NW FRONT AVE

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _6
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	101	mg/Kg	0.25	EPA 6020
ZINC	229	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	5.73	mg/Kg	0.50	EPA 6020
CADMIUM	0.63	mg/Kg	0.10	EPA 6020
CHROMIUM	54.9	mg/Kg	0.50	EPA 6020
LEAD	71.7	mg/Kg	0.10	EPA 6020
MERCURY	0.042	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	<500	mg/Kg	500	NWTPH-Dx
DIESEL	<250	mg/Kg	250	NWTPH-Dx
KEROSENE	<250	mg/Kg	250	NWTPH-Dx
MOTOR OIL	1410	mg/Kg	500	NWTPH-Dx
OUTSIDE				
TOTAL ORGANIC CARBON	13000	mg/Kg	102	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<2.46	µg/Kg	2.46	EPA 8081
4,4'-DDE	<2.46	µg/Kg	2.46	EPA 8081
4,4'-DDT	<24.6	µg/Kg	24.6	EPA 8081
Aldrin	6.7	µg/Kg	1.23	EPA 8081
Alpha-BHC	<1.23	µg/Kg	1.23	EPA 8081
Alpha-Chlordane	1.35	µg/Kg	1.23	EPA 8081
Beta-BHC	<1.23	µg/Kg	1.23	EPA 8081
Delta-BHC	<1.23	µg/Kg	1.23	EPA 8081
Dieldrin	6.39	µg/Kg	2.46	EPA 8081
Endosulfan I	<1.23	µg/Kg	1.23	EPA 8081

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 19:45 **System ID** AH06909 **Sample ID** **FO030838**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT537-0803
4700 NW FRONT AVE

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _6
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Endosulfan II	<2.46	µg/Kg	2.46	EPA 8081
Endosulfan Sulfate	<2.46	µg/Kg	2.46	EPA 8081
Endrin	<2.46	µg/Kg	2.46	EPA 8081
Endrin Aldehyde	<2.46	µg/Kg	2.46	EPA 8081
Endrin Ketone	<2.46	µg/Kg	2.46	EPA 8081
Gamma-BHC(Lindane)	<1.23	µg/Kg	1.23	EPA 8081
Gamma-Chlordane	2.29	µg/Kg	1.23	EPA 8081
Heptachlor	3.29	µg/Kg	1.23	EPA 8081
Heptachlor Epoxide	<1.23	µg/Kg	1.23	EPA 8081
Methoxychlor	<123	µg/Kg	1.23	EPA 8081
PCB 1016	<121	µg/Kg	121	EPA 8081
PCB 1221	<241	µg/Kg	241	EPA 8081
PCB 1232	<121	µg/Kg	121	EPA 8081
PCB 1242	<121	µg/Kg	121	EPA 8081
PCB 1248	<121	µg/Kg	121	EPA 8081
PCB 1254	130	µg/Kg	121	EPA 8081
PCB 1260	<121	µg/Kg	121	EPA 8081
Toxaphene	<123	µg/Kg	1.23	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<327	µg/Kg	327	EPA 8270 - S
1,2-Dichlorobenzene	<327	µg/Kg	327	EPA 8270 - S
1,3-Dichlorobenzene	<327	µg/Kg	327	EPA 8270 - S
1,4-Dichlorobenzene	<327	µg/Kg	327	EPA 8270 - S
2,4,5-Trichlorophenol	<327	µg/Kg	327	EPA 8270 - S
2,4,6-Trichlorophenol	<327	µg/Kg	327	EPA 8270 - S
2,4-Dichlorophenol	<327	µg/Kg	327	EPA 8270 - S
2,4-Dimethylphenol	<327	µg/Kg	327	EPA 8270 - S
2,4-Dinitrophenol	<1640	µg/Kg	1640	EPA 8270 - S
2,4-Dinitrotoluene	<327	µg/Kg	327	EPA 8270 - S

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Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 19:45 **System ID** AH06909 **Sample ID** **FO030838**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT537-0803
4700 NW FRONT AVE

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _6
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
2,6-Dinitrotoluene	<327	µg/Kg	327	EPA 8270 - S
2-Chloronaphthalene	<81.8	µg/Kg	81.8	EPA 8270 - S
2-Chlorophenol	<327	µg/Kg	327	EPA 8270 - S
2-Methylnaphthalene	<81.8	µg/Kg	81.8	EPA 8270 - S
2-Methylphenol	<327	µg/Kg	327	EPA 8270 - S
2-Nitroaniline	<327	µg/Kg	327	EPA 8270 - S
2-Nitrophenol	<327	µg/Kg	327	EPA 8270 - S
3,3'-Dichlorobenzidine	<654	µg/Kg	654	EPA 8270 - S
3- & 4-Methylphenol	<654	µg/Kg	654	EPA 8270 - S
3-Nitroaniline	<327	µg/Kg	327	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1640	µg/Kg	1640	EPA 8270 - S
4-Bromophenylphenyl ether	<327	µg/Kg	327	EPA 8270 - S
4-Chloro-3-methylphenol	<327	µg/Kg	327	EPA 8270 - S
4-Chloroaniline	<327	µg/Kg	327	EPA 8270 - S
4-Chlorophenylphenyl ether	<327	µg/Kg	327	EPA 8270 - S
4-Nitroaniline	<327	µg/Kg	327	EPA 8270 - S
4-Nitrophenol	<818	µg/Kg	818	EPA 8270 - S
Acenaphthene	<81.8	µg/Kg	81.8	EPA 8270 - S
Acenaphthylene	<81.8	µg/Kg	81.8	EPA 8270 - S
Anthracene	<81.8	µg/Kg	81.8	EPA 8270 - S
Benzo(a)anthracene	<81.8	µg/Kg	81.8	EPA 8270 - S
Benzo(a)pyrene	408	µg/Kg	81.8	EPA 8270 - S
Benzo(g,h,i)perylene	338	µg/Kg	81.8	EPA 8270 - S
Benzofluoranthenes	577	µg/Kg	81.8	EPA 8270 - S
Benzoic acid	<1640	µg/Kg	1640	EPA 8270 - S
Benzyl alcohol	<409	µg/Kg	409	EPA 8270 - S
Benzyl butyl phthalate	<409	µg/Kg	409	EPA 8270 - S
Bis(2-chloroethoxy) methane	<327	µg/Kg	327	EPA 8270 - S
Bis(2-chloroethyl) ether	<327	µg/Kg	327	EPA 8270 - S

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 9/16/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/20/03 19:45 **System ID** AH06909 **Sample ID** **FO030838**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-18-AAT537-0803
4700 NW FRONT AVE

Date Received: 8/21/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 18 _6
IMS File/Invoice #: 1020.001

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

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. Some Semi-volatile Organics surrogate recoveries were high due to matrix interference. Based on chromatographic evaluations, results for Pesticide compounds should be considered estimates due to matrix interferences.

Test Parameter	Result	Units	MRL	Method
Bis(2-chloroisopropyl) ether	<327	µg/Kg	327	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1640	µg/Kg	327	EPA 8270 - S
Chrysene	<81.8	µg/Kg	81.8	EPA 8270 - S
Di-n-butyl phthalate	558	µg/Kg	327	EPA 8270 - S
Di-n-octyl phthalate	<327	µg/Kg	327	EPA 8270 - S
Dibenzo(a,h)anthracene	<81.8	µg/Kg	81.8	EPA 8270 - S
Dibenzofuran	<327	µg/Kg	327	EPA 8270 - S
Diethyl phthalate	<327	µg/Kg	327	EPA 8270 - S
Dimethyl phthalate	<327	µg/Kg	327	EPA 8270 - S
Fluoranthene	339	µg/Kg	81.8	EPA 8270 - S
Fluorene	<81.8	µg/Kg	81.8	EPA 8270 - S
Hexachlorobenzene	<327	µg/Kg	327	EPA 8270 - S
Hexachlorobutadiene	<327	µg/Kg	327	EPA 8270 - S
Hexachlorocyclopentadiene	<327	µg/Kg	327	EPA 8270 - S
Hexachloroethane	<327	µg/Kg	327	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<81.8	µg/Kg	81.8	EPA 8270 - S
Isophorone	<327	µg/Kg	327	EPA 8270 - S
N-Nitrosodi-n-propylamine	<327	µg/Kg	327	EPA 8270 - S
N-Nitrosodiphenylamine	<327	µg/Kg	327	EPA 8270 - S
Naphthalene	<81.8	µg/Kg	81.8	EPA 8270 - S
Nitrobenzene	<327	µg/Kg	327	EPA 8270 - S
Pentachlorophenol	<327	µg/Kg	327	EPA 8270 - S
Phenanthrene	261	µg/Kg	81.8	EPA 8270 - S
Phenol	<327	µg/Kg	327	EPA 8270 - S
Pyrene	521	µg/Kg	81.8	EPA 8270 - S

End of Report for Sample ID: FO030838

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 9/16/03

Validated By: Signature on File

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: September 11, 2003

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

PROJECT: Lower Harbor of Sed. Sample

REPORT NUMBER: 115693

TOTAL NUMBER OF PAGES: _____

Enclosed are the test results for six samples received at STL Seattle on August 26, 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

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
115693-1	FO 030833	08-19-03 10:20	solid
115693-2	FO 030834	08-19-03 11:36	solid
115693-3	FO 030835	08-19-03 13:25	solid
115693-4	FO 030836	08-19-03 14:39	solid
115693-5	FO 030837	08-20-03 11:40	solid
115693-6	FO 030838	08-20-03 19:45	solid

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

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

ANALYTICAL NARRATIVE

Client: North Creek Analytical

Date: September 11, 2003

Project: Lower Harbor of Sed. Sample

Lab No.: 115693

Delivered By: Federal Express

Condition of samples upon receipt: Samples were received in good condition. Chain of custody was in order.

Sample Identification:

Lab. No.	Client ID	Date Sampled	Matrix
115693-1	FO 030833	08-19-03	solid
115693-2	FO 030834	08-19-03	solid
115693-3	FO 030835	08-19-03	solid
115693-4	FO 030836	08-19-03	solid
115693-5	FO 030837	08-20-03	solid
115693-6	FO 030838	08-20-03	solid

SAMPLE PREPARATION AND ANALYSIS

ORGANOCHLORINE Pesticides 8081

Sample 115693-01, 115693-04 and 115693-06 have PCB with similar response times as Some pesticide compounds. Results are considered approximate values. The EOR CCV failed low for DDT and Methoxychlor due to the severe matrix of the sample. The samples were diluted and the DDT and Methoxychlor results were reported from the diluted run.

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030833
Lab ID:	115693-01
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
% Solids	88.72
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	210	X9	35	144
Phenol - d5	132		39	140
Nitrobenzene - d5	298	X9	37	156
2 - Fluorobiphenyl	101		39	145
2,4,6 - Tribromophenol	91.9		25	148
p - Terphenyl - d14	363	X9	39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		298	149	
bis(2-Chloroethyl)ether	ND		298	149	
2-Chlorophenol	ND		298	149	
1,3-Dichlorobenzene	ND		298	149	
1,4-Dichlorobenzene	ND		298	149	
Benzyl Alcohol	ND		373	186	
1,2-Dichlorobenzene	ND		298	149	
2-Methylphenol	ND		298	149	
bis(2-Chloroisopropyl)ether	ND		298	149	
3-&4-Methylphenol	ND		596	298	
N-nitroso-di-n-propylamine	ND		298	149	
Hexachloroethane	ND		298	149	
Nitrobenzene	ND		298	149	
Isophorone	ND		298	149	
2-Nitrophenol	ND		298	149	
2,4-Dimethylphenol	ND		298	149	
Benzoic Acid		1990	1490	745	
bis(2-Chloroethoxy)methane	ND		298	149	
2,4-Dichlorophenol	ND		298	149	
1,2,4-Trichlorobenzene	ND		298	149	
Naphthalene		147	74.5	37.3	
4-Chloroaniline	ND		298	149	
Hexachlorobutadiene	ND		298	149	
4-Chloro-3-methylphenol	ND		298	149	
2-Methylnaphthalene		355	74.5	37.3	
Hexachlorocyclopentadiene	ND		298	149	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-01 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		298	149
2,4,5-Trichlorophenol	ND		298	149
2-Chloronaphthalene	ND		74.5	37.3
2-Nitroaniline	ND		298	149
Dimethylphthalate	ND		298	149
Acenaphthylene		478	74.5	37.3
2,6-Dinitrotoluene	ND		298	149
3-Nitroaniline	ND		298	149
Acenaphthene	ND		74.5	37.3
2,4-Dinitrophenol	ND		1490	745
4-Nitrophenol	ND		745	373
Dibenzofuran	ND		298	149
2,4-Dinitrotoluene	ND		298	149
Diethylphthalate	ND		298	149
4-Chlorophenylphenylether	ND		298	149
Fluorene	ND		74.5	37.3
4-Nitroaniline	ND		298	149
4,6-Dinitro-2-methylphenol	ND		1490	745
N-Nitrosodiphenylamine	ND		298	149
4-Bromophenylphenylether	ND		298	149
Hexachlorobenzene	ND		298	149
Pentachlorophenol	ND		298	149
Phenanthrene		445	74.5	37.3
Anthracene		260	74.5	37.3
Di-n-butylphthalate	ND		298	149
Fluoranthene		656	74.5	37.3
Pyrene		964	74.5	37.3
Butylbenzylphthalate	ND		373	186
3,3'-Dichlorobenzidine	ND		596	298
Benzo(a)anthracene	ND		74.5	37.3
Chrysene	ND		74.5	37.3
bis(2-Ethylhexyl)phthalate	ND		298	149
Di-n-octylphthalate	ND		298	149
Benzofluoranthenes		796	74.5	37.3
Benzo(a)pyrene		545	74.5	37.3
Indeno(1,2,3-cd)pyrene		1030	74.5	37.3
Dibenz(a,h)anthracene	ND		74.5	37.3
Benzo(g,h,i)perylene		1560	74.5	37.3

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030834
Lab ID:	115693-02
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
% Solids	76.85
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	234	X9	35	144
Phenol - d5	214	X9	39	140
Nitrobenzene - d5	181	X9	37	156
2 - Fluorobiphenyl	130		39	145
2,4,6 - Tribromophenol	247	X9	25	148
p - Terphenyl - d14	107		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		347	173	
bis(2-Chloroethyl)ether	ND		347	173	
2-Chlorophenol	ND		347	173	
1,3-Dichlorobenzene	ND		347	173	
1,4-Dichlorobenzene	ND		347	173	
Benzyl Alcohol	ND		434	217	
1,2-Dichlorobenzene	ND		347	173	
2-Methylphenol	ND		347	173	
bis(2-Chloroisopropyl)ether	ND		347	173	
3-&4-Methylphenol		823	694	347	
N-nitroso-di-n-propylamine	ND		347	173	
Hexachloroethane	ND		347	173	
Nitrobenzene	ND		347	173	
Isophorone	ND		347	173	
2-Nitrophenol	ND		347	173	
2,4-Dimethylphenol	ND		347	173	
Benzoic Acid	ND		1730	867	
bis(2-Chloroethoxy)methane	ND		347	173	
2,4-Dichlorophenol	ND		347	173	
1,2,4-Trichlorobenzene	ND		347	173	
Naphthalene	ND		86.7	43.4	
4-Chloroaniline	ND		347	173	
Hexachlorobutadiene	ND		347	173	
4-Chloro-3-methylphenol	ND		347	173	
2-Methylnaphthalene	ND		86.7	43.4	
Hexachlorocyclopentadiene	ND		347	173	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-02 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		347	173
2,4,5-Trichlorophenol	ND		347	173
2-Chloronaphthalene	ND		86.7	43.4
2-Nitroaniline	ND		347	173
Dimethylphthalate	ND		347	173
Acenaphthylene	ND		86.7	43.4
2,6-Dinitrotoluene	ND		347	173
3-Nitroaniline	ND		347	173
Acenaphthene	ND		86.7	43.4
2,4-Dinitrophenol	ND		1730	867
4-Nitrophenol	ND		867	434
Dibenzofuran	ND		347	173
2,4-Dinitrotoluene	ND		347	173
Diethylphthalate	ND		347	173
4-Chlorophenylphenylether	ND		347	173
Fluorene	ND		86.7	43.4
4-Nitroaniline	ND		347	173
4,6-Dinitro-2-methylphenol	ND		1730	867
N-Nitrosodiphenylamine	ND		347	173
4-Bromophenylphenylether	ND		347	173
Hexachlorobenzene	ND		347	173
Pentachlorophenol	ND		347	173
Phenanthrene	ND		86.7	43.4
Anthracene	ND		86.7	43.4
Di-n-butylphthalate	ND		347	173
Fluoranthene	ND		86.7	43.4
Pyrene	ND		86.7	43.4
Butylbenzylphthalate	ND		434	217
3,3'-Dichlorobenzidine	ND		694	347
Benzo(a)anthracene	ND		86.7	43.4
Chrysene	ND		86.7	43.4
bis(2-Ethylhexyl)phthalate		990	347	173
Di-n-octylphthalate	ND		347	173
Benzofluoranthenes	ND		86.7	43.4
Benzo(a)pyrene	ND		86.7	43.4
Indeno(1,2,3-cd)pyrene	ND		86.7	43.4
Dibenz(a,h)anthracene	ND		86.7	43.4
Benzo(g,h,i)perylene	ND		86.7	43.4

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030835
Lab ID:	115693-03
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
% Solids	73.5
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	126		35	144
Phenol - d5	174	X9	39	140
Nitrobenzene - d5	111		37	156
2 - Fluorobiphenyl	93		39	145
2,4,6 - Tribromophenol	118		25	148
p - Terphenyl - d14	154		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		354	177	
bis(2-Chloroethyl)ether	ND		354	177	
2-Chlorophenol	ND		354	177	
1,3-Dichlorobenzene	ND		354	177	
1,4-Dichlorobenzene	ND		354	177	
Benzyl Alcohol	ND		442	221	
1,2-Dichlorobenzene	ND		354	177	
2-Methylphenol	ND		354	177	
bis(2-Chloroisopropyl)ether	ND		354	177	
3-&4-Methylphenol	ND		707	354	
N-nitroso-di-n-propylamine	ND		354	177	
Hexachloroethane	ND		354	177	
Nitrobenzene	ND		354	177	
Isophorone	ND		354	177	
2-Nitrophenol	ND		354	177	
2,4-Dimethylphenol	ND		354	177	
Benzoic Acid	ND		1770	884	
bis(2-Chloroethoxy)methane	ND		354	177	
2,4-Dichlorophenol	ND		354	177	
1,2,4-Trichlorobenzene	ND		354	177	
Naphthalene	ND		88.4	44.2	
4-Chloroaniline	ND		354	177	
Hexachlorobutadiene	ND		354	177	
4-Chloro-3-methylphenol	ND		354	177	
2-Methylnaphthalene	ND		88.4	44.2	
Hexachlorocyclopentadiene	ND		354	177	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-03 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		354	177	
2,4,5-Trichlorophenol	ND		354	177	
2-Chloronaphthalene	ND		88.4	44.2	
2-Nitroaniline	ND		354	177	
Dimethylphthalate	ND		354	177	
Acenaphthylene	ND		88.4	44.2	
2,6-Dinitrotoluene	ND		354	177	
3-Nitroaniline	ND		354	177	
Acenaphthene	ND		88.4	44.2	
2,4-Dinitrophenol	ND		1770	884	
4-Nitrophenol	ND		884	442	
Dibenzofuran	ND		354	177	
2,4-Dinitrotoluene	ND		354	177	
Diethylphthalate	ND		354	177	
4-Chlorophenylphenylether	ND		354	177	
Fluorene	ND		88.4	44.2	
4-Nitroaniline	ND		354	177	
4,6-Dinitro-2-methylphenol	ND		1770	884	
N-Nitrosodiphenylamine	ND		354	177	
4-Bromophenylphenylether	ND		354	177	
Hexachlorobenzene	ND		354	177	
Pentachlorophenol	ND		354	177	
Phenanthrene		143	88.4	44.2	
Anthracene		50.9	88.4	44.2	J
Di-n-butylphthalate	ND		354	177	
Fluoranthene		218	88.4	44.2	
Pyrene		190	88.4	44.2	
Butylbenzylphthalate		1040	442	221	
3,3'-Dichlorobenzidine	ND		707	354	
Benzo(a)anthracene	ND		88.4	44.2	
Chrysene	ND		88.4	44.2	
bis(2-Ethylhexyl)phthalate		917	354	177	
Di-n-octylphthalate	ND		354	177	
Benzofluoranthenes		323	88.4	44.2	
Benzo(a)pyrene		217	88.4	44.2	
Indeno(1,2,3-cd)pyrene		201	88.4	44.2	
Dibenz(a,h)anthracene	ND		88.4	44.2	
Benzo(g,h,i)perylene		338	88.4	44.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030836
Lab ID:	115693-04
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
% Solids	78.57
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	111		35	144
Phenol - d5	227	X9	39	140
Nitrobenzene - d5	132		37	156
2 - Fluorobiphenyl	106		39	145
2,4,6 - Tribromophenol	154	X9	25	148
p - Terphenyl - d14	141		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		328	164	
bis(2-Chloroethyl)ether	ND		328	164	
2-Chlorophenol	ND		328	164	
1,3-Dichlorobenzene	ND		328	164	
1,4-Dichlorobenzene	ND		328	164	
Benzyl Alcohol	ND		410	205	
1,2-Dichlorobenzene	ND		328	164	
2-Methylphenol	ND		328	164	
bis(2-Chloroisopropyl)ether	ND		328	164	
3-&4-Methylphenol		624	655	328	J
N-nitroso-di-n-propylamine	ND		328	164	
Hexachloroethane	ND		328	164	
Nitrobenzene	ND		328	164	
Isophorone	ND		328	164	
2-Nitrophenol	ND		328	164	
2,4-Dimethylphenol	ND		328	164	
Benzoic Acid	ND		1640	819	
bis(2-Chloroethoxy)methane	ND		328	164	
2,4-Dichlorophenol	ND		328	164	
1,2,4-Trichlorobenzene	ND		328	164	
Naphthalene	ND		81.9	41	
4-Chloroaniline	ND		328	164	
Hexachlorobutadiene	ND		328	164	
4-Chloro-3-methylphenol	ND		328	164	
2-Methylnaphthalene	ND		81.9	41	
Hexachlorocyclopentadiene	ND		328	164	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-04 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		328	164
2,4,5-Trichlorophenol	ND		328	164
2-Chloronaphthalene	ND		81.9	41
2-Nitroaniline	ND		328	164
Dimethylphthalate	ND		328	164
Acenaphthylene	ND		81.9	41
2,6-Dinitrotoluene	ND		328	164
3-Nitroaniline	ND		328	164
Acenaphthene	ND		81.9	41
2,4-Dinitrophenol	ND		1640	819
4-Nitrophenol	ND		819	410
Dibenzofuran	ND		328	164
2,4-Dinitrotoluene	ND		328	164
Diethylphthalate	ND		328	164
4-Chlorophenylphenylether	ND		328	164
Fluorene	ND		81.9	41
4-Nitroaniline	ND		328	164
4,6-Dinitro-2-methylphenol	ND		1640	819
N-Nitrosodiphenylamine	ND		328	164
4-Bromophenylphenylether	ND		328	164
Hexachlorobenzene	ND		328	164
Pentachlorophenol	ND		328	164
Phenanthrene		168	81.9	41
Anthracene	ND		81.9	41
Di-n-butylphthalate	ND		328	164
Fluoranthene		196	81.9	41
Pyrene		231	81.9	41
Butylbenzylphthalate	ND		410	205
3,3'-Dichlorobenzidine	ND		655	328
Benzo(a)anthracene	ND		81.9	41
Chrysene	ND		81.9	41
bis(2-Ethylhexyl)phthalate		1020	328	164
Di-n-octylphthalate	ND		328	164
Benzofluoranthenes	ND		81.9	41
Benzo(a)pyrene	ND		81.9	41
Indeno(1,2,3-cd)pyrene	ND		81.9	41
Dibenz(a,h)anthracene	ND		81.9	41
Benzo(g,h,i)perylene	ND		81.9	41

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030837
Lab ID:	115693-05
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/28/2003
% Solids	78.09
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	202	X9	35	144
Phenol - d5	187	X9	39	140
Nitrobenzene - d5	162	X9	37	156
2 - Fluorobiphenyl	124		39	145
2,4,6 - Tribromophenol	104		25	148
p - Terphenyl - d14	159	X9	39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		338	169	
bis(2-Chloroethyl)ether	ND		338	169	
2-Chlorophenol	ND		338	169	
1,3-Dichlorobenzene	ND		338	169	
1,4-Dichlorobenzene	ND		338	169	
Benzyl Alcohol	ND		422	211	
1,2-Dichlorobenzene	ND		338	169	
2-Methylphenol	ND		338	169	
bis(2-Chloroisopropyl)ether	ND		338	169	
3-&4-Methylphenol	ND		676	338	
N-nitroso-di-n-propylamine	ND		338	169	
Hexachloroethane	ND		338	169	
Nitrobenzene	ND		338	169	
Isophorone	ND		338	169	
2-Nitrophenol	ND		338	169	
2,4-Dimethylphenol	ND		338	169	
Benzoic Acid	ND		1690	845	
bis(2-Chloroethoxy)methane	ND		338	169	
2,4-Dichlorophenol	ND		338	169	
1,2,4-Trichlorobenzene	ND		338	169	
Naphthalene	ND		84.5	42.2	
4-Chloroaniline	ND		338	169	
Hexachlorobutadiene	ND		338	169	
4-Chloro-3-methylphenol	ND		338	169	
2-Methylnaphthalene	ND		84.5	42.2	
Hexachlorocyclopentadiene	ND		338	169	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-05 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		338	169	
2,4,5-Trichlorophenol	ND		338	169	
2-Chloronaphthalene	ND		84.5	42.2	
2-Nitroaniline	ND		338	169	
Dimethylphthalate	ND		338	169	
Acenaphthylene	ND		84.5	42.2	
2,6-Dinitrotoluene	ND		338	169	
3-Nitroaniline	ND		338	169	
Acenaphthene	ND		84.5	42.2	
2,4-Dinitrophenol	ND		1690	845	
4-Nitrophenol	ND		845	422	
Dibenzofuran	ND		338	169	
2,4-Dinitrotoluene	ND		338	169	
Diethylphthalate	ND		338	169	
4-Chlorophenylphenylether	ND		338	169	
Fluorene		43.2	84.5	42.2	J
4-Nitroaniline	ND		338	169	
4,6-Dinitro-2-methylphenol	ND		1690	845	
N-Nitrosodiphenylamine	ND		338	169	
4-Bromophenylphenylether	ND		338	169	
Hexachlorobenzene	ND		338	169	
Pentachlorophenol	ND		338	169	
Phenanthrene	ND		84.5	42.2	
Anthracene	ND		84.5	42.2	
Di-n-butylphthalate	ND		338	169	
Fluoranthene		134	84.5	42.2	
Pyrene		195	84.5	42.2	
Butylbenzylphthalate	ND		422	211	
3,3'-Dichlorobenzidine	ND		676	338	
Benzo(a)anthracene	ND		84.5	42.2	
Chrysene	ND		84.5	42.2	
bis(2-Ethylhexyl)phthalate		576	338	169	
Di-n-octylphthalate	ND		338	169	
Benzofluoranthenes	ND		84.5	42.2	
Benzo(a)pyrene	ND		84.5	42.2	
Indeno(1,2,3-cd)pyrene	ND		84.5	42.2	
Dibenz(a,h)anthracene	ND		84.5	42.2	
Benzo(g,h,i)perylene	ND		84.5	42.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030838
Lab ID:	115693-06
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	8/28/2003
% Solids	80.39
Dilution Factor	20

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	183	X9	35	144
Phenol - d5	238	X9	39	140
Nitrobenzene - d5	188	X9	37	156
2 - Fluorobiphenyl	142		39	145
2,4,6 - Tribromophenol	156	X9	25	148
p - Terphenyl - d14	129		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		327	164	
bis(2-Chloroethyl)ether	ND		327	164	
2-Chlorophenol	ND		327	164	
1,3-Dichlorobenzene	ND		327	164	
1,4-Dichlorobenzene	ND		327	164	
Benzyl Alcohol	ND		409	205	
1,2-Dichlorobenzene	ND		327	164	
2-Methylphenol	ND		327	164	
bis(2-Chloroisopropyl)ether	ND		327	164	
3-&4-Methylphenol	ND		654	327	
N-nitroso-di-n-propylamine	ND		327	164	
Hexachloroethane	ND		327	164	
Nitrobenzene	ND		327	164	
Isophorone	ND		327	164	
2-Nitrophenol	ND		327	164	
2,4-Dimethylphenol	ND		327	164	
Benzoic Acid	ND		1640	818	
bis(2-Chloroethoxy)methane	ND		327	164	
2,4-Dichlorophenol	ND		327	164	
1,2,4-Trichlorobenzene	ND		327	164	
Naphthalene	ND		81.8	40.9	
4-Chloroaniline	ND		327	164	
Hexachlorobutadiene	ND		327	164	
4-Chloro-3-methylphenol	ND		327	164	
2-Methylnaphthalene	ND		81.8	40.9	
Hexachlorocyclopentadiene	ND		327	164	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115693-06 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		327	164	
2,4,5-Trichlorophenol	ND		327	164	
2-Chloronaphthalene	ND		81.8	40.9	
2-Nitroaniline	ND		327	164	
Dimethylphthalate	ND		327	164	
Acenaphthylene	ND		81.8	40.9	
2,6-Dinitrotoluene	ND		327	164	
3-Nitroaniline	ND		327	164	
Acenaphthene		52.9	81.8	40.9	J
2,4-Dinitrophenol	ND		1640	818	
4-Nitrophenol	ND		818	409	
Dibenzofuran	ND		327	164	
2,4-Dinitrotoluene	ND		327	164	
Diethylphthalate	ND		327	164	
4-Chlorophenylphenylether	ND		327	164	
Fluorene		43.2	81.8	40.9	J
4-Nitroaniline	ND		327	164	
4,6-Dinitro-2-methylphenol	ND		1640	818	
N-Nitrosodiphenylamine	ND		327	164	
4-Bromophenylphenylether	ND		327	164	
Hexachlorobenzene	ND		327	164	
Pentachlorophenol	ND		327	164	
Phenanthrene		261	81.8	40.9	
Anthracene		54	81.8	40.9	J
Di-n-butylphthalate		558	327	164	
Fluoranthene		339	81.8	40.9	
Pyrene		521	81.8	40.9	
Butylbenzylphthalate	ND		409	205	
3,3'-Dichlorobenzidine	ND		654	327	
Benzo(a)anthracene	ND		81.8	40.9	
Chrysene	ND		81.8	40.9	
bis(2-Ethylhexyl)phthalate		1640	327	164	
Di-n-octylphthalate	ND		327	164	
Benzofluoranthenes		577	81.8	40.9	
Benzo(a)pyrene		408	81.8	40.9	
Indeno(1,2,3-cd)pyrene	ND		81.8	40.9	
Dibenz(a,h)anthracene	ND		81.8	40.9	
Benzo(g,h,i)perylene		338	81.8	40.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030833
Lab ID:	115693-01
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	88.72
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	77.1		72	114
Decachlorobiphenyl	94.8		55	133

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.107	0.0533	
Aroclor 1221	ND		0.213	0.107	
Aroclor 1232	ND		0.107	0.0533	
Aroclor 1242	ND		0.107	0.0533	
Aroclor 1248	ND		0.107	0.0533	
Aroclor 1254	ND		0.107	0.0533	
Aroclor 1260		0.624	0.107	0.0533	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030834
Lab ID:	115693-02
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	76.85
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	87.8		72	114
Decachlorobiphenyl	98		55	133

Sample results are on a dry weight basis.

Analyte	**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND	0.122	0.0611	
Aroclor 1221	ND	0.244	0.122	
Aroclor 1232	ND	0.122	0.0611	
Aroclor 1242	ND	0.122	0.0611	
Aroclor 1248	ND	0.122	0.0611	
Aroclor 1254	ND	0.122	0.0611	
Aroclor 1260	ND	0.122	0.0611	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030835
Lab ID:	115693-03
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	73.5
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	96.6		72	114
Decachlorobiphenyl	105		55	133

Sample results are on a dry weight basis.

Analyte	**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND	0.132	0.0662	
Aroclor 1221	ND	0.265	0.132	
Aroclor 1232	ND	0.132	0.0662	
Aroclor 1242	ND	0.132	0.0662	
Aroclor 1248	ND	0.132	0.0662	
Aroclor 1254	ND	0.132	0.0662	
Aroclor 1260	ND	0.132	0.0662	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030836
Lab ID:	115693-04
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	78.57
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	99.8		72	114
Decachlorobiphenyl	110		55	133

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.127	0.0636	
Aroclor 1221	ND		0.254	0.127	
Aroclor 1232	ND		0.127	0.0636	
Aroclor 1242	ND		0.127	0.0636	
Aroclor 1248	ND		0.127	0.0636	
Aroclor 1254		0.187	0.127	0.0636	
Aroclor 1260	ND		0.127	0.0636	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030837
Lab ID:	115693-05
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	78.09
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	95.2		72	114
Decachlorobiphenyl	102		55	133

Sample results are on a dry weight basis.

Analyte	**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND	0.127	0.0633	
Aroclor 1221	ND	0.253	0.127	
Aroclor 1232	ND	0.127	0.0633	
Aroclor 1242	ND	0.127	0.0633	
Aroclor 1248	ND	0.127	0.0633	
Aroclor 1254	ND	0.127	0.0633	
Aroclor 1260	ND	0.127	0.0633	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030838
Lab ID:	115693-06
Date Received:	8/26/03
Date Prepared:	8/27/03
Date Analyzed:	8/29/03
% Solids	80.39
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	90.3		72	114
Decachlorobiphenyl	100		55	133

Sample results are on a dry weight basis.

Analyte		**Result (mg/kg)**	**PQL**	**MRL**	**Flags**
Aroclor 1016	ND		0.121	0.0604	
Aroclor 1221	ND		0.241	0.121	
Aroclor 1232	ND		0.121	0.0604	
Aroclor 1242	ND		0.121	0.0604	
Aroclor 1248	ND		0.121	0.0604	
Aroclor 1254		0.13	0.121	0.0604	
Aroclor 1260	ND		0.121	0.0604	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030833
Lab ID:	115693-01
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	88.72
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	72.4		57	153
Decachlorobiphenyl	65.2		57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin		35.8	1.12	0.56	C2,N
alpha-BHC	ND		1.12	0.56	
beta-BHC	ND		1.12	0.56	
delta-BHC		25.9	1.12	0.56	C2,N
gamma-BHC (Lindane)		1.87	1.12	0.56	C1,N
4,4'-DDD		80.4	2.24	1.12	C1,N
4,4'-DDE		20.7	2.24	1.12	C2,N
4,4'-DDT		284	22.4	11.2	C1,D10,N
Dieldrin		45.7	2.24	1.12	C2,N
Endosulfan I		5.82	1.12	0.56	C2,N
Endosulfan II	ND		2.24	1.12	
Endosulfan sulfate	ND		2.24	1.12	
Endrin		70.4	2.24	1.12	C2,N
Endrin aldehyde		198	2.24	1.12	C2,E,N
Heptachlor		3.03	1.12	0.56	C2,N
Heptachlor epoxide	ND		1.12	0.56	
Methoxychlor	ND		112	56	
Endrin ketone	ND		2.24	1.12	
Toxaphene	ND		112	56	
alpha-Chlordane		152	1.12	0.56	C2,D10,N
gamma-Chlordane		512	1.12	0.56	C1,D10,N

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030834
Lab ID:	115693-02
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	76.85
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	140		57	153
Decachlorobiphenyl	67.3		57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		12.7	12.7	
alpha-BHC	ND		1.27	1.27	
beta-BHC	ND		1.27	1.27	
delta-BHC	ND		1.27	1.27	
gamma-BHC (Lindane)	ND		1.27	1.27	
4,4'-DDD	ND		2.53	2.53	
4,4'-DDE	ND		2.53	2.53	
4,4'-DDT	ND		25.3	25.3	
Dieldrin	ND		2.53	2.53	
Endosulfan I	ND		1.27	1.27	
Endosulfan II	ND		2.53	2.53	
Endosulfan sulfate	ND		2.53	2.53	
Endrin	ND		2.53	2.53	
Endrin aldehyde	ND		2.53	2.53	
Heptachlor	ND		1.27	1.27	
Heptachlor epoxide	ND		1.27	1.27	
Methoxychlor	ND		127	127	
Endrin ketone	ND		2.53	2.53	
Toxaphene	ND		127	127	
alpha-Chlordane	ND		1.27	1.27	
gamma-Chlordane	ND		1.27	1.27	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030835
Lab ID:	115693-03
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	73.5
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	78.4		57	153
Decachlorobiphenyl	71.7		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND	1.3	1.3	
alpha-BHC	ND	1.3	1.3	
beta-BHC	ND	1.3	1.3	
delta-BHC	ND	1.3	1.3	
gamma-BHC (Lindane)	ND	1.3	1.3	
4,4'-DDD	ND	2.61	2.61	
4,4'-DDE	ND	2.61	2.61	
4,4'-DDT	ND	26.1	26.1	
Dieldrin	ND	2.61	2.61	
Endosulfan I	ND	1.3	1.3	
Endosulfan II	ND	2.61	2.61	
Endosulfan sulfate	ND	2.61	2.61	
Endrin	ND	2.61	2.61	
Endrin aldehyde	ND	2.61	2.61	
Heptachlor	ND	1.3	1.3	
Heptachlor epoxide	ND	1.3	1.3	
Methoxychlor	ND	130	130	
Endrin ketone	ND	2.61	2.61	
Toxaphene	ND	130	130	
alpha-Chlordane	ND	1.3	1.3	
gamma-Chlordane	ND	1.3	1.3	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030836
Lab ID:	115693-04
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	78.57
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	69.8		57	153
Decachlorobiphenyl	56.3	X9	57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin		9.09	1.24	1.24	C1,N
alpha-BHC	ND		1.24	1.24	
beta-BHC	ND		1.24	1.24	
delta-BHC		3.54	1.24	1.24	C2,N
gamma-BHC (Lindane)	ND		1.24	1.24	
4,4'-DDD		11.9	2.47	2.47	C1,N
4,4'-DDE		20.7	2.47	2.47	C1,N
4,4'-DDT	ND		24.7	24.7	
Dieldrin		13.9	2.47	2.47	C2,N
Endosulfan I	ND		1.24	1.24	
Endosulfan II	ND		2.47	2.47	
Endosulfan sulfate	ND		2.47	2.47	
Endrin	ND		2.47	2.47	
Endrin aldehyde	ND		2.47	2.47	
Heptachlor	ND		1.24	1.24	
Heptachlor epoxide	ND		1.24	1.24	
Methoxychlor	ND		124	124	
Endrin ketone	ND		2.47	2.47	
Toxaphene	ND		124	124	
alpha-Chlordane		9.14	1.24	1.24	C2,N
gamma-Chlordane		9.95	1.24	1.24	C1,N

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030837
Lab ID:	115693-05
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	78.09
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	69.4		57	153
Decachlorobiphenyl	81		57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		1.25	1.25	
alpha-BHC	ND		1.25	1.25	
beta-BHC	ND		1.25	1.25	
delta-BHC	ND		1.25	1.25	
gamma-BHC (Lindane)	ND		1.25	1.25	
4,4'-DDD	ND		2.5	2.5	
4,4'-DDE	ND		2.5	2.5	
4,4'-DDT	ND		25	25	
Dieldrin		4.77	2.5	2.5	C2
Endosulfan I	ND		1.25	1.25	
Endosulfan II	ND		2.5	2.5	
Endosulfan sulfate	ND		2.5	2.5	
Endrin	ND		2.5	2.5	
Endrin aldehyde	ND		2.5	2.5	
Heptachlor	ND		1.25	1.25	
Heptachlor epoxide	ND		1.25	1.25	
Methoxychlor	ND		125	125	
Endrin ketone	ND		2.5	2.5	
Toxaphene	ND		125	125	
alpha-Chlordane	ND		1.25	1.25	
gamma-Chlordane	ND		1.25	1.25	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030838
Lab ID:	115693-06
Date Received:	8/26/2003
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
% Solids	80.39
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	74.6		57	153
Decachlorobiphenyl	50.5	X9	57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin		6.7	1.23	1.23	C2,N
alpha-BHC	ND		1.23	1.23	
beta-BHC	ND		1.23	1.23	
delta-BHC	ND		1.23	1.23	
gamma-BHC (Lindane)	ND		1.23	1.23	
4,4'-DDD	ND		2.46	2.46	
4,4'-DDE	ND		2.46	2.46	
4,4'-DDT	ND		24.6	24.6	
Dieldrin		6.39	2.46	2.46	C2,N
Endosulfan I	ND		1.23	1.23	
Endosulfan II	ND		2.46	2.46	
Endosulfan sulfate	ND		2.46	2.46	
Endrin	ND		2.46	2.46	
Endrin aldehyde	ND		2.46	2.46	
Heptachlor		3.29	1.23	1.23	C2,N
Heptachlor epoxide	ND		1.23	1.23	
Methoxychlor	ND		123	123	
Endrin ketone	ND		2.46	2.46	
Toxaphene	ND		123	123	
alpha-Chlordane		1.35	1.23	1.23	C1,N
gamma-Chlordane		2.29	1.23	1.23	C2,N

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030833
Lab ID:	115693-01
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	88.72
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	52900	127	50.8	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030834
Lab ID:	115693-02
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	76.85
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	5530	87.7	35.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030835
Lab ID:	115693-03
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	73.5
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	8030	87.2	34.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030836
Lab ID:	115693-04
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	78.57
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	13300	87.2	34.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030837
Lab ID:	115693-05
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	78.09
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	6700	93.2	37.3	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030838
Lab ID:	115693-06
Date Received:	8/26/03
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% Solids	80.39
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	13000	102	40.8	

STL Seattle

Lab ID:	Method Blank - SS0917
Date Received:	-
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
% Solids	
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	96.1		35	144
Phenol - d5	103		39	140
Nitrobenzene - d5	96.4		37	156
2 - Fluorobiphenyl	67.9		39	145
2,4,6 - Tribromophenol	84.3		25	148
p - Terphenyl - d14	131		39	158

Sample results are on an as received basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		13.3	6.67	
bis(2-Chloroethyl)ether	ND		13.3	6.67	
2-Chlorophenol	ND		13.3	6.67	
1,3-Dichlorobenzene	ND		13.3	6.67	
1,4-Dichlorobenzene	ND		13.3	6.67	
Benzyl Alcohol	ND		16.7	8.33	
1,2-Dichlorobenzene	ND		13.3	6.67	
2-Methylphenol	ND		13.3	6.67	
bis(2-Chloroisopropyl)ether	ND		13.3	6.67	
3-&4-Methylphenol	ND		26.7	13.3	
N-nitroso-di-n-propylamine	ND		13.3	6.67	
Hexachloroethane	ND		13.3	6.67	
Nitrobenzene	ND		13.3	6.67	
Isophorone	ND		13.3	6.67	
2-Nitrophenol	ND		13.3	6.67	
2,4-Dimethylphenol	ND		13.3	6.67	
Benzoic Acid	ND		66.7	33.3	
bis(2-Chloroethoxy)methane	ND		13.3	6.67	
2,4-Dichlorophenol	ND		13.3	6.67	
1,2,4-Trichlorobenzene	ND		13.3	6.67	
Naphthalene	ND		3.33	1.67	
4-Chloroaniline	ND		13.3	6.67	
Hexachlorobutadiene	ND		13.3	6.67	
4-Chloro-3-methylphenol	ND		13.3	6.67	
2-Methylnaphthalene	ND		3.33	1.67	
Hexachlorocyclopentadiene	ND		13.3	6.67	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for SS0917 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		13.3	6.67
2,4,5-Trichlorophenol	ND		13.3	6.67
2-Chloronaphthalene	ND		3.33	1.67
2-Nitroaniline	ND		13.3	6.67
Dimethylphthalate	ND		13.3	6.67
Acenaphthylene	ND		3.33	1.67
2,6-Dinitrotoluene	ND		13.3	6.67
3-Nitroaniline	ND		13.3	6.67
Acenaphthene	ND		3.33	1.67
2,4-Dinitrophenol	ND		66.7	33.3
4-Nitrophenol	ND		33.3	16.7
Dibenzofuran	ND		13.3	6.67
2,4-Dinitrotoluene	ND		13.3	6.67
Diethylphthalate	ND		13.3	6.67
4-Chlorophenylphenylether	ND		13.3	6.67
Fluorene	ND		3.33	1.67
4-Nitroaniline	ND		13.3	6.67
4,6-Dinitro-2-methylphenol	ND		66.7	33.3
N-Nitrosodiphenylamine	ND		13.3	6.67
4-Bromophenylphenylether	ND		13.3	6.67
Hexachlorobenzene	ND		13.3	6.67
Pentachlorophenol	ND		13.3	6.67
Phenanthrene	ND		3.33	1.67
Anthracene	ND		3.33	1.67
Di-n-butylphthalate	ND		13.3	6.67
Fluoranthene	ND		3.33	1.67
Pyrene	ND		3.33	1.67
Butylbenzylphthalate	ND		16.7	8.33
3,3'-Dichlorobenzidine	ND		26.7	13.3
Benzo(a)anthracene	ND		3.33	1.67
Chrysene	ND		3.33	1.67
bis(2-Ethylhexyl)phthalate	ND		13.3	6.67
Di-n-octylphthalate	ND		13.3	6.67
Benzofluoranthenes	ND		3.33	1.67
Benzo(a)pyrene	ND		3.33	1.67
Indeno(1,2,3-cd)pyrene	ND		3.33	1.67
Dibenz(a,h)anthracene	ND		3.33	1.67
Benzo(g,h,i)perylene	ND		3.33	1.67

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	SS0917
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
QC Batch ID:	SS0917

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	74.5	74.5	77.3	77.3	3.7	
2-Chlorophenol	0	100	97.5	97.5	88.1	88.1	-10	
1,4-Dichlorobenzene	0	66.7	62.7	94	55.6	83.4	-12	
N-nitroso-di-n-propylamine	0	66.7	55.1	82.7	70.4	106	25	
1,2,4-Trichlorobenzene	0	66.7	51.4	77.1	47.6	71.4	-7.7	
4-Chloro-3-methylphenol	0	100	79.9	79.9	103	103	25	
Acenaphthene	0	66.7	53.1	79.7	53.6	80.4	0.87	
4-Nitrophenol	0	100	142	142	140	140	-1.4	
2,4-Dinitrotoluene	0	66.7	42.2	63.3	49.9	74.8	17	
Pentachlorophenol	0	100	36.4	36.4	42.4	42.4	15	
Pyrene	0	66.7	85.5	128	72.8	109	-16	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	SITE #1 SKAGIT RIVER FRESHWATER SEDIMENT
Lab ID:	115691-01
Date Prepared:	8/27/2003
Date Analyzed:	8/27/2003
QC Batch ID:	SS0917

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	136	114	84	142	104	21	
2-Chlorophenol	0	136	120	88.8	153	113	24	
1,4-Dichlorobenzene	0	90.3	86.5	95.8	101	112	16	
N-nitroso-di-n-propylamine	0	90.3	94.5	105	125	138	27	X7
1,2,4-Trichlorobenzene	0	90.3	74.4	82.3	78.5	86.7	5.2	
4-Chloro-3-methylphenol	0	136	155	114	144	106	-7.3	
Acenaphthene	0	90.3	76.9	85.2	87.6	96.8	13	
4-Nitrophenol	0	136	179	132	176	130	-1.5	
2,4-Dinitrotoluene	0	90.3	73.6	81.5	52.8	58.4	-33	
Pentachlorophenol	0	136	86.2	63.6	127	93.6	38	
Pyrene	0	90.3	112	124	120	133	7	

STL Seattle

Lab ID:	Method Blank - PB0577
Date Received:	-
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
% Solids	
Dilution Factor	5

PCBs by USEPA Method 8082

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	90.4		72	114
Decachlorobiphenyl	101		55	133

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:	PB0577
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
QC Batch ID:	PB0577

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	0.913	91.3	0.905	90.5	-0.88	
Aroclor 1260	0	1	0.973	97.3	0.973	97.3	0	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 030833
Lab ID:	115693-01
Date Prepared:	8/27/03
Date Analyzed:	8/28/03
QC Batch ID:	PB0577

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	1.1	0.837	76.4	0.841	79	3.3	
Aroclor 1260	0.62	1.1	1.54	83.9	1.53	85.1	1.4	

STL Seattle

Lab ID:	Method Blank - PE1624
Date Received:	-
Date Prepared:	8/27/2003
Date Analyzed:	9/5/2003
% Solids	
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081A

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	82.7		57	153
Decachlorobiphenyl	86.6		57	145

Sample results are on an as received basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		1	0.5	
alpha-BHC	ND		1	0.5	
beta-BHC	ND		1	0.5	
delta-BHC	ND		1	0.5	
gamma-BHC (Lindane)	ND		1	0.5	
4,4'-DDD	ND		2	1	
4,4'-DDE	ND		2	1	
4,4'-DDT	ND		2	1	
Dieldrin	ND		2	1	
Endosulfan I	ND		1	0.5	
Endosulfan II	ND		2	1	
Endosulfan sulfate	ND		2	1	
Endrin	ND		2	1	
Endrin aldehyde	ND		2	1	
Heptachlor	ND		1	0.5	
Heptachlor epoxide	ND		1	0.5	
Methoxychlor	ND		10	5	
Endrin ketone	ND		2	1	
Toxaphene	ND		100	50	
alpha-Chlordane	ND		1	0.5	
gamma-Chlordane	ND		1	0.5	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PE1624
Date Prepared:	8/27/2003
Date Analyzed:	9/6/2003
QC Batch ID:	PE1624

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	33.6	83.9	32.6	81.5	-2.9	
alpha-BHC	0	40	35	87.6	33.5	83.8	-4.4	
beta-BHC	0	40	30.1	75.2	28.8	72.1	-4.2	
delta-BHC	0	40	32.6	81.5	30.8	77.1	-5.5	
gamma-BHC (Lindane)	0	40	34.5	86.3	32.8	81.9	-5.2	
4,4'-DDD	0	40	34.5	86.2	33.8	84.5	-2	
4,4'-DDE	0	40	33	82.5	32.3	80.8	-2.1	
4,4'-DDT	0	40	35.8	89.4	34.7	86.8	-3	
Dieldrin	0	40	33.6	84	32.9	82.2	-2.2	
Endosulfan I	0	40	32.5	81.3	31.8	79.5	-2.2	
Endosulfan II	0	40	30.6	76.6	29.5	73.7	-3.9	
Endosulfan sulfate	0	40	21.8	54.6	18.2	45.5	-18	
Endrin	0	40	33.6	84.1	32.5	81.3	-3.4	
Endrin aldehyde	0	40	25.6	63.9	23.1	57.8	-10	
Heptachlor	0	40	35.1	87.7	33	82.4	-6.2	
Heptachlor epoxide	0	40	32	80	31.2	77.9	-2.7	
Methoxychlor	0	40	35.1	87.9	34.6	86.6	-1.5	
Endrin ketone	0	40	26.5	66.4	23.9	59.9	-10	
alpha-Chlordane	0	40	33.4	83.6	32.8	81.9	-2.1	
gamma-Chlordane	0	40	34.3	85.8	33.6	83.9	-2.2	

STL Seattle

Lab ID:	Method Blank - TOC1065
Date Received:	-
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
% 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:	GHSS-03
Lab ID:	115850-01
Date Prepared:	9/9/03
Date Analyzed:	9/9/03
QC Batch ID:	TOC1065

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	14000	25000	39900	106	36000	87.6	-19	

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

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

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 $\leq$ 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.

nca

2.7°C

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-9508 425-420-9200 FAX 420-9210
11115 E Montgomery Suite B, Spokane, WA 99206-4776 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave, Beaverton, OR 97008-7132 503-906-9200 FAX 906-9210 [X]
20332 Empire Ave Suite F-1, Bend, OR 99701-5711 541-383-9310 FAX 382-7588
3209 Denali St, Anchorage, AK 99503-4030 907-334-9200 FAX 334-9210

CHAIN OF COUSTODY REPORT

115693

Work Order #: P3H0656

CLIENT: City of Portland

REPORT TO: Renee Chauvin
ADDRESS:

PHONE: FAX:

INVOICE TO: Charles Lytle

P.O. NUMBER: 40707

PROJECT NAME: Lower Harbor of SED SAmp

PROJECT NUMBER:

SAMPLED BY:

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [X] 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE / REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pest/PCB SVCSI	Sim Vol EPA 8270-SIM	TOC EPA 9060 MOD										MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1	FO 030833	8/19/03 1020	X	X	X										S	3		
2	FO 030834	↓ 1136	X	X	X										S	3		
3	FO 030835	↓ 1325	X	X	X										S	3		
4	FO 030836	↓ 1439	X	X	X										S	3		
5	FO 030837	8/20/03 1140	X	X	X										S	3		
6	FO 030838	8/20/03 1945	X	X	X										S	3		
7																		
8																		
9																		
10																		

RELEASED BY: [signature] PRINT NAME: Daniel K. Van Meter II FIRM: CoP DATE: 8/21/03 TIME: 13:00

RECEIVED BY: [signature] PRINT NAME: Bob F. FIRM: NCA DATE: 8/21/03 TIME: 13:00

RELEASED BY: [signature] PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY: [signature] PRINT NAME: Callie Fanshore FIRM: NCA DATE: 8/21/03 TIME: 1335

ADDITIONAL REMARKS: [signature] 8/22/03 2550 8/25/03

TEMP: 4.1

PAGE OF

COC REV 1/03

Received: [signature] G.111CS 08/25/03 1528

Relinquished [signature] G.111CS 08/25/03 1555

[signature] STL Seattle 8/26/03 945

PDX/032880007.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: 8/13/03
Page: 1 of 1
Collected By: MJH / DJH

Project Name: LOWER HARBOR OF SED SAMP
File Number: 1020.001 **Matrix:** SEDIMENT

[1]Run NWTPH-Dx and NWTPH-Gx if detects on NWTPH-HCID

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: Pesticides/PCBs	PAH	TOC	NWTPH-HCID[1]	Metals: Total Metals - EPA 6020 (As, Cu, Cd, Cr, Hg, Pb, Zn)	Total Metals - EPA 200.8 (As, Cu, Cd, Cr, Pb, Zn)	Total Mercury - EPA 200.8	Field Comments
FO 030809	IL-M1-AAM104-0803-NE N BASIN & ENSIGN	M1_1	08/12/03	0958	G	●	●	●	●	●			
FO 030810	IL-M1-AAM104-0803-SW N BASIN & ENSIGN	M1_2	08/12/03	1054	G	●	●	●	●	●			
FO 030811	IL-M1-AAJ831-0803 6936 N FATHOM	M1_3	08/12/03	1345	G	●	●	●	●	●			
FO 030812	IL-M1-AAJ933-0803 N ENSIGN & UPRR	M1_4	08/12/03	1440	G	●	●	●	●	●			
FO 030813	IL-M1-AAM155-0803 6235 N. BASIN	M1_5	08/13/03	0950	G	●	●	●	●	●			
FO 030814	IL-M1-AAJ829-0803 N. BASIN & N. FATHOM	M1_6	08/13/03	1142	G	●	●	●	●	●			
FO 030815	IL-M1-XXY101-0803 DUPLICATE	DUP	08/12/03	1345	G	●	●	●	●	●			
FO 030816	RINSATE	RINSE	08/12/03	0750	G	●	●	●	●		●	●	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Signature:	Signature:	Signature:
Time: 1603	Time:	Time:	Time:
Printed Name: MICHAEL HAUSER	Printed Name:	Printed Name:	Printed Name:
Date: 8/13/03	Date:	Date:	Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature:	Signature:	Signature:	Signature:
Time: 1603	Time:	Time:	Time:
Printed Name: KRIS DENNIS	Printed Name:	Printed Name:	Printed Name:
Date: 8/13/03	Date:	Date:	Date:

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 9:58 **System ID** AH06696 **Sample ID** **FO030809**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-NE
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_1
IMS File/Invoice #: 1020.001

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

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. Two of two surrogate compounds and three of 20 MS and MSD analytes for Pesticide analysis had low recoveries due to matrix interference.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	80.0	mg/Kg	0.25	EPA 6020
ZINC	1810	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	47.1	mg/Kg	0.50	EPA 6020
CADMIUM	6.11	mg/Kg	0.10	EPA 6020
CHROMIUM	69.2	mg/Kg	0.50	EPA 6020
LEAD	42.9	mg/Kg	0.10	EPA 6020
MERCURY	0.073	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	162	mg/Kg	50	NWTPH-Dx
DIESEL	<25	mg/Kg	25	NWTPH-Dx
KEROSENE	<25	mg/Kg	25	NWTPH-Dx
MOTOR OIL	1210	mg/Kg	50	NWTPH-Dx
NWTPH-HCID				
DIESEL	<50	mg/Kg	50	NWTPH-HCID
GASOLINE	<20	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	<100	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	115	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	29700	mg/Kg	48	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<7.06	µg/Kg	7.06	EPA 8081
4,4'-DDE	<7.06	µg/Kg	7.06	EPA 8081

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 9:58 **System ID** AH06696 **Sample ID** **FO030809**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-NE
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_1
IMS File/Invoice #: 1020.001

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

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. Two of two surrogate compounds and three of 20 MS and MSD analytes for Pesticide analysis had low recoveries due to matrix interference.

Test Parameter	Result	Units	MRL	Method
4,4'-DDT	<7.06	µg/Kg	7.06	EPA 8081
Aldrin	<3.53	µg/Kg	3.53	EPA 8081
Alpha-BHC	<3.53	µg/Kg	3.53	EPA 8081
Alpha-Chlordane	<3.53	µg/Kg	3.53	EPA 8081
Beta-BHC	<3.53	µg/Kg	3.53	EPA 8081
Delta-BHC	<3.53	µg/Kg	3.53	EPA 8081
Dieldrin	<7.06	µg/Kg	7.06	EPA 8081
Endosulfan I	<3.53	µg/Kg	3.53	EPA 8081
Endosulfan II	<7.06	µg/Kg	7.06	EPA 8081
Endosulfan Sulfate	<7.06	µg/Kg	7.06	EPA 8081
Endrin	<7.06	µg/Kg	7.06	EPA 8081
Endrin Aldehyde	<7.06	µg/Kg	7.06	EPA 8081
Endrin Ketone	<7.06	µg/Kg	7.06	EPA 8081
Gamma-BHC(Lindane)	<3.53	µg/Kg	3.53	EPA 8081
Gamma-Chlordane	<3.53	µg/Kg	3.53	EPA 8081
Heptachlor	<3.53	µg/Kg	3.53	EPA 8081
Heptachlor Epoxide	<3.53	µg/Kg	3.53	EPA 8081
Methoxychlor	<35.3	µg/Kg	35.3	EPA 8081
PCB 1016	<34.6	µg/Kg	34.6	EPA 8081
PCB 1221	<69.1	µg/Kg	69.1	EPA 8081
PCB 1232	<34.6	µg/Kg	34.6	EPA 8081
PCB 1242	<34.6	µg/Kg	34.6	EPA 8081
PCB 1248	<34.6	µg/Kg	34.6	EPA 8081
PCB 1254	<34.6	µg/Kg	34.6	EPA 8081
PCB 1260	<34.6	µg/Kg	34.6	EPA 8081
Toxaphene	<353	µg/Kg	353	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<976	µg/Kg	976	EPA 8270 - S
1,2-Dichlorobenzene	<976	µg/Kg	976	EPA 8270 - S

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 9:58 **System ID** AH06696 **Sample ID** **FO030809**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-NE
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_1
IMS File/Invoice #: 1020.001

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

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. Two of two surrogate compounds and three of 20 MS and MSD analytes for Pesticide analysis had low recoveries due to matrix interference.

Test Parameter	Result	Units	MRL	Method
1,3-Dichlorobenzene	<976	µg/Kg	976	EPA 8270 - S
1,4-Dichlorobenzene	<976	µg/Kg	976	EPA 8270 - S
2,4,5-Trichlorophenol	<976	µg/Kg	976	EPA 8270 - S
2,4,6-Trichlorophenol	<976	µg/Kg	976	EPA 8270 - S
2,4-Dichlorophenol	<976	µg/Kg	976	EPA 8270 - S
2,4-Dimethylphenol	<976	µg/Kg	976	EPA 8270 - S
2,4-Dinitrophenol	<4880	µg/Kg	4880	EPA 8270 - S
2,4-Dinitrotoluene	<976	µg/Kg	976	EPA 8270 - S
2,6-Dinitrotoluene	<976	µg/Kg	976	EPA 8270 - S
2-Chloronaphthalene	<244	µg/Kg	244	EPA 8270 - S
2-Chlorophenol	<976	µg/Kg	976	EPA 8270 - S
2-Methylnaphthalene	<244	µg/Kg	244	EPA 8270 - S
2-Methylphenol	<976	µg/Kg	976	EPA 8270 - S
2-Nitroaniline	<976	µg/Kg	976	EPA 8270 - S
2-Nitrophenol	<976	µg/Kg	976	EPA 8270 - S
3,3'-Dichlorobenzidine	<1950	µg/Kg	1950	EPA 8270 - S
3- & 4-Methylphenol	<1950	µg/Kg	1950	EPA 8270 - S
3-Nitroaniline	<976	µg/Kg	976	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<4880	µg/Kg	4880	EPA 8270 - S
4-Bromophenylphenyl ether	<976	µg/Kg	976	EPA 8270 - S
4-Chloro-3-methylphenol	<976	µg/Kg	976	EPA 8270 - S
4-Chloroaniline	<976	µg/Kg	976	EPA 8270 - S
4-Chlorophenylphenyl ether	<976	µg/Kg	976	EPA 8270 - S
4-Nitroaniline	<976	µg/Kg	976	EPA 8270 - S
4-Nitrophenol	<2440	µg/Kg	2440	EPA 8270 - S
Acenaphthene	<244	µg/Kg	244	EPA 8270 - S
Acenaphthylene	<244	µg/Kg	244	EPA 8270 - S
Anthracene	<244	µg/Kg	244	EPA 8270 - S
Benzo(a)anthracene	<244	µg/Kg	244	EPA 8270 - S

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Report Date: 9/15/03

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 9:58 **System ID** AH06696 **Sample ID** **FO030809**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-NE
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_1
IMS File/Invoice #: 1020.001

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

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. Two of two surrogate compounds and three of 20 MS and MSD analytes for Pesticide analysis had low recoveries due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Benzo(a)pyrene	<244	µg/Kg	244	EPA 8270 - S
Benzo(g,h,i)perylene	<244	µg/Kg	244	EPA 8270 - S
Benzofluoranthenes	<244	µg/Kg	244	EPA 8270 - S
Benzoic acid	<4880	µg/Kg	4880	EPA 8270 - S
Benzyl alcohol	<1220	µg/Kg	1220	EPA 8270 - S
Benzyl butyl phthalate	<1220	µg/Kg	1220	EPA 8270 - S
Bis(2-chloroethoxy) methane	<976	µg/Kg	976	EPA 8270 - S
Bis(2-chloroethyl) ether	<976	µg/Kg	976	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<976	µg/Kg	976	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1330	µg/Kg	976	EPA 8270 - S
Chrysene	<244	µg/Kg	244	EPA 8270 - S
Di-n-butyl phthalate	<976	µg/Kg	976	EPA 8270 - S
Di-n-octyl phthalate	<976	µg/Kg	976	EPA 8270 - S
Dibenzo(a,h)anthracene	<244	µg/Kg	244	EPA 8270 - S
Dibenzofuran	<976	µg/Kg	976	EPA 8270 - S
Diethyl phthalate	<976	µg/Kg	976	EPA 8270 - S
Dimethyl phthalate	<976	µg/Kg	976	EPA 8270 - S
Fluoranthene	<244	µg/Kg	244	EPA 8270 - S
Fluorene	<244	µg/Kg	244	EPA 8270 - S
Hexachlorobenzene	<976	µg/Kg	976	EPA 8270 - S
Hexachlorobutadiene	<976	µg/Kg	976	EPA 8270 - S
Hexachlorocyclopentadiene	<976	µg/Kg	976	EPA 8270 - S
Hexachloroethane	<976	µg/Kg	976	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<244	µg/Kg	244	EPA 8270 - S
Isophorone	<976	µg/Kg	976	EPA 8270 - S
N-Nitrosodi-n-propylamine	<976	µg/Kg	976	EPA 8270 - S
N-Nitrosodiphenylamine	<976	µg/Kg	976	EPA 8270 - S
Naphthalene	<244	µg/Kg	244	EPA 8270 - S
Nitrobenzene	<976	µg/Kg	976	EPA 8270 - S

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 9:58 **System ID** AH06696 **Sample ID** **FO030809**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-NE
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_1
IMS File/Invoice #: 1020.001

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

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. Two of two surrogate compounds and three of 20 MS and MSD analytes for Pesticide analysis had low recoveries due to matrix interference.

Test Parameter	Result	Units	MRL	Method
Pentachlorophenol	<976	µg/Kg	976	EPA 8270 - S
Phenanthrene	<244	µg/Kg	244	EPA 8270 - S
Phenol	<976	µg/Kg	976	EPA 8270 - S
Pyrene	<244	µg/Kg	244	EPA 8270 - S

End of Report for Sample ID: FO030809

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 10:54 **System ID** AH06697 **Sample ID** **FO030810**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-SW
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_2
IMS File/Invoice #: 1020.001

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

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. One of the two surrogate compounds for Pesticide analysis had low recovery.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	116	mg/Kg	0.25	EPA 6020
ZINC	1500	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	40.0	mg/Kg	0.50	EPA 6020
CADMIUM	5.30	mg/Kg	0.10	EPA 6020
CHROMIUM	51.3	mg/Kg	0.50	EPA 6020
LEAD	30.9	mg/Kg	0.10	EPA 6020
MERCURY	0.057	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	234	mg/Kg	50	NWTPH-Dx
DIESEL	<25	mg/Kg	25	NWTPH-Dx
KEROSENE	<25	mg/Kg	25	NWTPH-Dx
MOTOR OIL	1420	mg/Kg	50	NWTPH-Dx
NWTPH-HCID				
DIESEL	<50	mg/Kg	50	NWTPH-HCID
GASOLINE	<20	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	<100	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	118	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	23200	mg/Kg	57.1	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<5.2	µg/Kg	5.2	EPA 8081
4,4'-DDE	<5.2	µg/Kg	5.2	EPA 8081

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 10:54 **System ID** AH06697 **Sample ID** **FO030810**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-SW N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_2
IMS File/Invoice #: 1020.001

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

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. One of the two surrogate compounds for Pesticide analysis had low recovery.

Test Parameter	Result	Units	MRL	Method
4,4'-DDT	<5.2	µg/Kg	5.2	EPA 8081
Aldrin	<2.6	µg/Kg	2.6	EPA 8081
Alpha-BHC	<2.6	µg/Kg	2.6	EPA 8081
Alpha-Chlordane	<2.6	µg/Kg	2.6	EPA 8081
Beta-BHC	<2.6	µg/Kg	2.6	EPA 8081
Delta-BHC	<2.6	µg/Kg	2.6	EPA 8081
Dieldrin	<5.2	µg/Kg	5.2	EPA 8081
Endosulfan I	<2.6	µg/Kg	2.6	EPA 8081
Endosulfan II	<5.2	µg/Kg	5.2	EPA 8081
Endosulfan Sulfate	<5.2	µg/Kg	5.2	EPA 8081
Endrin	<5.2	µg/Kg	5.2	EPA 8081
Endrin Aldehyde	<5.2	µg/Kg	5.2	EPA 8081
Endrin Ketone	<5.2	µg/Kg	5.2	EPA 8081
Gamma-BHC(Lindane)	<2.6	µg/Kg	2.6	EPA 8081
Gamma-Chlordane	<2.6	µg/Kg	2.6	EPA 8081
Heptachlor	<2.6	µg/Kg	2.6	EPA 8081
Heptachlor Epoxide	<2.6	µg/Kg	2.6	EPA 8081
Methoxychlor	<26	µg/Kg	26	EPA 8081
PCB 1016	<26.7	µg/Kg	26.7	EPA 8081
PCB 1221	<53.4	µg/Kg	53.4	EPA 8081
PCB 1232	<26.7	µg/Kg	26.7	EPA 8081
PCB 1242	<26.7	µg/Kg	26.7	EPA 8081
PCB 1248	<26.7	µg/Kg	26.7	EPA 8081
PCB 1254	<26.7	µg/Kg	26.7	EPA 8081
PCB 1260	<26.7	µg/Kg	26.7	EPA 8081
Toxaphene	<260	µg/Kg	260	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<697	µg/Kg	697	EPA 8270 - S
1,2-Dichlorobenzene	<697	µg/Kg	697	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 10:54 **System ID** AH06697 **Sample ID** **FO030810**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-SW
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_2
IMS File/Invoice #: 1020.001

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

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. One of the two surrogate compounds for Pesticide analysis had low recovery.

Test Parameter	Result	Units	MRL	Method
1,3-Dichlorobenzene	<697	µg/Kg	697	EPA 8270 - S
1,4-Dichlorobenzene	<697	µg/Kg	697	EPA 8270 - S
2,4,5-Trichlorophenol	<697	µg/Kg	697	EPA 8270 - S
2,4,6-Trichlorophenol	<697	µg/Kg	697	EPA 8270 - S
2,4-Dichlorophenol	<697	µg/Kg	697	EPA 8270 - S
2,4-Dimethylphenol	<697	µg/Kg	697	EPA 8270 - S
2,4-Dinitrophenol	<3490	µg/Kg	3490	EPA 8270 - S
2,4-Dinitrotoluene	<697	µg/Kg	697	EPA 8270 - S
2,6-Dinitrotoluene	<697	µg/Kg	697	EPA 8270 - S
2-Chloronaphthalene	<174	µg/Kg	174	EPA 8270 - S
2-Chlorophenol	<697	µg/Kg	697	EPA 8270 - S
2-Methylnaphthalene	<174	µg/Kg	174	EPA 8270 - S
2-Methylphenol	<697	µg/Kg	697	EPA 8270 - S
2-Nitroaniline	<697	µg/Kg	697	EPA 8270 - S
2-Nitrophenol	<697	µg/Kg	697	EPA 8270 - S
3,3'-Dichlorobenzidine	<1390	µg/Kg	1390	EPA 8270 - S
3- & 4-Methylphenol	<1390	µg/Kg	1390	EPA 8270 - S
3-Nitroaniline	<697	µg/Kg	697	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<3490	µg/Kg	3490	EPA 8270 - S
4-Bromophenylphenyl ether	<697	µg/Kg	697	EPA 8270 - S
4-Chloro-3-methylphenol	<697	µg/Kg	697	EPA 8270 - S
4-Chloroaniline	<697	µg/Kg	697	EPA 8270 - S
4-Chlorophenylphenyl ether	<697	µg/Kg	697	EPA 8270 - S
4-Nitroaniline	<697	µg/Kg	697	EPA 8270 - S
4-Nitrophenol	<1740	µg/Kg	1740	EPA 8270 - S
Acenaphthene	<174	µg/Kg	174	EPA 8270 - S
Acenaphthylene	<174	µg/Kg	174	EPA 8270 - S
Anthracene	<174	µg/Kg	174	EPA 8270 - S
Benzo(a)anthracene	<174	µg/Kg	174	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 10:54 **System ID** AH06697 **Sample ID** **FO030810**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-SW N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_2
IMS File/Invoice #: 1020.001

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

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. One of the two surrogate compounds for Pesticide analysis had low recovery.

Test Parameter	Result	Units	MRL	Method
Benzo(a)pyrene	<174	µg/Kg	174	EPA 8270 - S
Benzo(g,h,i)perylene	<174	µg/Kg	174	EPA 8270 - S
Benzofluoranthenes	<174	µg/Kg	174	EPA 8270 - S
Benzoic acid	<3480	µg/Kg	3480	EPA 8270 - S
Benzyl alcohol	<871	µg/Kg	871	EPA 8270 - S
Benzyl butyl phthalate	<871	µg/Kg	871	EPA 8270 - S
Bis(2-chloroethoxy) methane	<697	µg/Kg	697	EPA 8270 - S
Bis(2-chloroethyl) ether	<697	µg/Kg	697	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<697	µg/Kg	697	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1000	µg/Kg	697	EPA 8270 - S
Chrysene	<174	µg/Kg	174	EPA 8270 - S
Di-n-butyl phthalate	<697	µg/Kg	697	EPA 8270 - S
Di-n-octyl phthalate	<697	µg/Kg	697	EPA 8270 - S
Dibenzo(a,h)anthracene	<174	µg/Kg	174	EPA 8270 - S
Dibenzofuran	<697	µg/Kg	697	EPA 8270 - S
Diethyl phthalate	<697	µg/Kg	697	EPA 8270 - S
Dimethyl phthalate	<697	µg/Kg	697	EPA 8270 - S
Fluoranthene	<174	µg/Kg	174	EPA 8270 - S
Fluorene	<174	µg/Kg	174	EPA 8270 - S
Hexachlorobenzene	<697	µg/Kg	697	EPA 8270 - S
Hexachlorobutadiene	<697	µg/Kg	697	EPA 8270 - S
Hexachlorocyclopentadiene	<697	µg/Kg	697	EPA 8270 - S
Hexachloroethane	<697	µg/Kg	697	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<174	µg/Kg	174	EPA 8270 - S
Isophorone	<697	µg/Kg	697	EPA 8270 - S
N-Nitrosodi-n-propylamine	<697	µg/Kg	697	EPA 8270 - S
N-Nitrosodiphenylamine	<697	µg/Kg	697	EPA 8270 - S
Naphthalene	<174	µg/Kg	174	EPA 8270 - S
Nitrobenzene	<697	µg/Kg	697	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 10:54 **System ID** AH06697 **Sample ID** **FO030810**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM104-0803-SW
N BASIN & ENSIGN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_2
IMS File/Invoice #: 1020.001

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

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. One of the two surrogate compounds for Pesticide analysis had low recovery.

Test Parameter	Result	Units	MRL	Method
Pentachlorophenol	<697	µg/Kg	697	EPA 8270 - S
Phenanthrene	<174	µg/Kg	174	EPA 8270 - S
Phenol	<697	µg/Kg	697	EPA 8270 - S
Pyrene	<174	µg/Kg	174	EPA 8270 - S

End of Report for Sample ID: FO030810

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06698 **Sample ID** **FO030811**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ831-0803
6936 N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_3
IMS File/Invoice #: 1020.001

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

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 surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons. For Pesticide analysis, 2nd column confirmation produced results for the detected compounds that differed by >40%.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	176	mg/Kg	0.25	EPA 6020
ZINC	902	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	3.36	mg/Kg	0.50	EPA 6020
CADMIUM	27.8	mg/Kg	0.10	EPA 6020
CHROMIUM	280	mg/Kg	0.50	EPA 6020
LEAD	645	mg/Kg	0.10	EPA 6020
MERCURY	0.064	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	7240	mg/Kg	500	NWTPH-Dx
DIESEL	<250	mg/Kg	250	NWTPH-Dx
KEROSENE	<250	mg/Kg	250	NWTPH-Dx
MOTOR OIL	11700	mg/Kg	500	NWTPH-Dx
NWTPH-HCID				
DIESEL	DET	mg/Kg	50	NWTPH-HCID
GASOLINE	DET	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	DET	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	Not Reportable	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	21000	mg/Kg	45.1	EPA 9060 MO
NWTPH-Gx				
GASOLINE RANGE HYDROCARBONS	221	mg/Kg	5.14	NWTPH-Gx
PESTICIDES/PCB'S BY EPA 8081				

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Report Date: 9/15/03

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06698 **Sample ID** **FO030811**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ831-0803
6936 N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_3
IMS File/Invoice #: 1020.001

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

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 surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons. For Pesticide analysis, 2nd column confirmation produced results for the detected compounds that differed by >40%.

Test Parameter	Result	Units	MRL	Method
4,4'-DDD	<2.56	µg/Kg	2.56	EPA 8081
4,4'-DDE	7.56	µg/Kg	2.56	EPA 8081
4,4'-DDT	<2.56	µg/Kg	2.56	EPA 8081
Aldrin	8.13	µg/Kg	1.28	EPA 8081
Alpha-BHC	<1.28	µg/Kg	1.28	EPA 8081
Alpha-Chlordane	<1.28	µg/Kg	1.28	EPA 8081
Beta-BHC	7.16	µg/Kg	1.28	EPA 8081
Delta-BHC	<1.28	µg/Kg	1.28	EPA 8081
Dieldrin	<2.56	µg/Kg	2.56	EPA 8081
Endosulfan I	<1.28	µg/Kg	1.28	EPA 8081
Endosulfan II	15.7	µg/Kg	2.56	EPA 8081
Endosulfan Sulfate	<2.56	µg/Kg	2.56	EPA 8081
Endrin	16.9	µg/Kg	2.56	EPA 8081
Endrin Aldehyde	17.3	µg/Kg	2.56	EPA 8081
Endrin Ketone	<2.56	µg/Kg	2.56	EPA 8081
Gamma-BHC(Lindane)	<1.28	µg/Kg	1.28	EPA 8081
Gamma-Chlordane	<1.28	µg/Kg	1.28	EPA 8081
Heptachlor	1.66	µg/Kg	1.28	EPA 8081
Heptachlor Epoxide	<1.28	µg/Kg	1.28	EPA 8081
Methoxychlor	<12.8	µg/Kg	12.8	EPA 8081
PCB 1016	<12.9	µg/Kg	12.9	EPA 8081
PCB 1221	<25.7	µg/Kg	25.7	EPA 8081
PCB 1232	<12.9	µg/Kg	12.9	EPA 8081
PCB 1242	<12.9	µg/Kg	12.9	EPA 8081
PCB 1248	<12.9	µg/Kg	12.9	EPA 8081
PCB 1254	276	µg/Kg	12.9	EPA 8081
PCB 1260	129	µg/Kg	12.9	EPA 8081
Toxaphene	<128	µg/Kg	128	EPA 8081

SEMI-VOLATILE ORGANICS

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06698 **Sample ID** **FO030811**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ831-0803
6936 N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_3
IMS File/Invoice #: 1020.001

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

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 surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons. For Pesticide analysis, 2nd column confirmation produced results for the detected compounds that differed by >40%.

Test Parameter	Result	Units	MRL	Method
1,2,4-Trichlorobenzene	<345	µg/Kg	345	EPA 8270 - S
1,2-Dichlorobenzene	<345	µg/Kg	345	EPA 8270 - S
1,3-Dichlorobenzene	<345	µg/Kg	345	EPA 8270 - S
1,4-Dichlorobenzene	<345	µg/Kg	345	EPA 8270 - S
2,4,5-Trichlorophenol	<345	µg/Kg	345	EPA 8270 - S
2,4,6-Trichlorophenol	<345	µg/Kg	345	EPA 8270 - S
2,4-Dichlorophenol	<345	µg/Kg	345	EPA 8270 - S
2,4-Dimethylphenol	<345	µg/Kg	345	EPA 8270 - S
2,4-Dinitrophenol	<1730	µg/Kg	1730	EPA 8270 - S
2,4-Dinitrotoluene	<345	µg/Kg	345	EPA 8270 - S
2,6-Dinitrotoluene	<345	µg/Kg	345	EPA 8270 - S
2-Chloronaphthalene	<86.3	µg/Kg	86.3	EPA 8270 - S
2-Chlorophenol	<345	µg/Kg	345	EPA 8270 - S
2-Methylnaphthalene	2380	µg/Kg	86.3	EPA 8270 - S
2-Methylphenol	<345	µg/Kg	345	EPA 8270 - S
2-Nitroaniline	<345	µg/Kg	345	EPA 8270 - S
2-Nitrophenol	<345	µg/Kg	345	EPA 8270 - S
3,3'-Dichlorobenzidine	<690	µg/Kg	690	EPA 8270 - S
3- & 4-Methylphenol	<690	µg/Kg	690	EPA 8270 - S
3-Nitroaniline	<345	µg/Kg	345	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1730	µg/Kg	1730	EPA 8270 - S
4-Bromophenylphenyl ether	<345	µg/Kg	345	EPA 8270 - S
4-Chloro-3-methylphenol	<345	µg/Kg	345	EPA 8270 - S
4-Chloroaniline	<345	µg/Kg	345	EPA 8270 - S
4-Chlorophenylphenyl ether	<345	µg/Kg	345	EPA 8270 - S
4-Nitroaniline	<345	µg/Kg	345	EPA 8270 - S
4-Nitrophenol	<863	µg/Kg	863	EPA 8270 - S
Acenaphthene	<86.3	µg/Kg	86.3	EPA 8270 - S
Acenaphthylene	<86.3	µg/Kg	86.3	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06698 **Sample ID** **FO030811**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ831-0803
6936 N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_3
IMS File/Invoice #: 1020.001

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

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 surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons. For Pesticide analysis, 2nd column confirmation produced results for the detected compounds that differed by >40%.

Test Parameter	Result	Units	MRL	Method
Anthracene	<86.3	µg/Kg	86.3	EPA 8270 - S
Benzo(a)anthracene	<86.3	µg/Kg	86.3	EPA 8270 - S
Benzo(a)pyrene	<86.3	µg/Kg	86.3	EPA 8270 - S
Benzo(g,h,i)perylene	<86.3	µg/Kg	86.3	EPA 8270 - S
Benzofluoranthenes	<86.3	µg/Kg	86.3	EPA 8270 - S
Benzoic acid	<1730	µg/Kg	1730	EPA 8270 - S
Benzyl alcohol	<431	µg/Kg	431	EPA 8270 - S
Benzyl butyl phthalate	<431	µg/Kg	431	EPA 8270 - S
Bis(2-chloroethoxy) methane	<345	µg/Kg	345	EPA 8270 - S
Bis(2-chloroethyl) ether	<345	µg/Kg	345	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<345	µg/Kg	345	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	14800	µg/Kg	345	EPA 8270 - S
Chrysene	<86.3	µg/Kg	86.3	EPA 8270 - S
Di-n-butyl phthalate	<345	µg/Kg	345	EPA 8270 - S
Di-n-octyl phthalate	<345	µg/Kg	345	EPA 8270 - S
Dibenzo(a,h)anthracene	<86.3	µg/Kg	86.3	EPA 8270 - S
Dibenzofuran	<345	µg/Kg	345	EPA 8270 - S
Diethyl phthalate	<345	µg/Kg	345	EPA 8270 - S
Dimethyl phthalate	<345	µg/Kg	345	EPA 8270 - S
Fluoranthene	292	µg/Kg	86.3	EPA 8270 - S
Fluorene	<86.3	µg/Kg	86.3	EPA 8270 - S
Hexachlorobenzene	<345	µg/Kg	345	EPA 8270 - S
Hexachlorobutadiene	<345	µg/Kg	345	EPA 8270 - S
Hexachlorocyclopentadiene	<345	µg/Kg	345	EPA 8270 - S
Hexachloroethane	<345	µg/Kg	345	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<86.3	µg/Kg	86.3	EPA 8270 - S
Isophorone	<345	µg/Kg	345	EPA 8270 - S
N-Nitrosodi-n-propylamine	<345	µg/Kg	345	EPA 8270 - S
N-Nitrosodiphenylamine	<345	µg/Kg	345	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06698 **Sample ID** **FO030811**

Page: 5

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ831-0803
6936 N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_3
IMS File/Invoice #: 1020.001

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

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 surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons. For Pesticide analysis, 2nd column confirmation produced results for the detected compounds that differed by >40%.

Test Parameter	Result	Units	MRL	Method
Naphthalene	368	µg/Kg	86.3	EPA 8270 - S
Nitrobenzene	<345	µg/Kg	345	EPA 8270 - S
Pentachlorophenol	<345	µg/Kg	345	EPA 8270 - S
Phenanthrene	1290	µg/Kg	86.3	EPA 8270 - S
Phenol	<345	µg/Kg	345	EPA 8270 - S
Pyrene	602	µg/Kg	86.3	EPA 8270 - S

End of Report for Sample ID: FO030811

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 14:40 **System ID** AH06699 **Sample ID** **FO030812**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ933-0803
N ENSIGN & UPRR

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_4
IMS File/Invoice #: 1020.001

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

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
METALS				
COPPER	290	mg/Kg	0.25	EPA 6020
ZINC	1450	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	40.8	mg/Kg	0.50	EPA 6020
CADMIUM	5.12	mg/Kg	0.10	EPA 6020
CHROMIUM	260	mg/Kg	0.50	EPA 6020
LEAD	21.4	mg/Kg	0.10	EPA 6020
MERCURY	0.068	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	314	mg/Kg	50	NWTPH-Dx
DIESEL	<25	mg/Kg	25	NWTPH-Dx
KEROSENE	<25	mg/Kg	25	NWTPH-Dx
MOTOR OIL	2310	mg/Kg	50	NWTPH-Dx
NWTPH-HCID				
DIESEL	<50	mg/Kg	50	NWTPH-HCID
GASOLINE	<20	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	<100	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	132	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	31900	mg/Kg	50.4	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<7.67	µg/Kg	7.67	EPA 8081
4,4'-DDE	<7.67	µg/Kg	7.67	EPA 8081

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 14:40 **System ID** AH06699 **Sample ID** **FO030812**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ933-0803
N ENSIGN & UPRR

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_4
IMS File/Invoice #: 1020.001

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

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
4,4'-DDT	<7.67	µg/Kg	7.67	EPA 8081
Aldrin	<3.84	µg/Kg	3.84	EPA 8081
Alpha-BHC	<3.84	µg/Kg	3.84	EPA 8081
Alpha-Chlordane	<3.84	µg/Kg	3.84	EPA 8081
Beta-BHC	<3.84	µg/Kg	3.84	EPA 8081
Delta-BHC	<3.84	µg/Kg	3.84	EPA 8081
Dieldrin	<7.67	µg/Kg	7.67	EPA 8081
Endosulfan I	<3.84	µg/Kg	3.84	EPA 8081
Endosulfan II	<7.67	µg/Kg	7.67	EPA 8081
Endosulfan Sulfate	<7.67	µg/Kg	7.67	EPA 8081
Endrin	<7.67	µg/Kg	7.67	EPA 8081
Endrin Aldehyde	<7.67	µg/Kg	7.67	EPA 8081
Endrin Ketone	<7.67	µg/Kg	7.67	EPA 8081
Gamma-BHC(Lindane)	<3.84	µg/Kg	3.84	EPA 8081
Gamma-Chlordane	<3.84	µg/Kg	3.84	EPA 8081
Heptachlor	<3.84	µg/Kg	3.84	EPA 8081
Heptachlor Epoxide	<3.84	µg/Kg	3.84	EPA 8081
Methoxychlor	<38.4	µg/Kg	38.4	EPA 8081
PCB 1016	<35.5	µg/Kg	35.5	EPA 8081
PCB 1221	<71	µg/Kg	71	EPA 8081
PCB 1232	<35.5	µg/Kg	35.5	EPA 8081
PCB 1242	<35.5	µg/Kg	35.5	EPA 8081
PCB 1248	<35.5	µg/Kg	35.5	EPA 8081
PCB 1254	<35.5	µg/Kg	35.5	EPA 8081
PCB 1260	<35.5	µg/Kg	35.5	EPA 8081
Toxaphene	<384	µg/Kg	384	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<997	µg/Kg	997	EPA 8270 - S
1,2-Dichlorobenzene	<997	µg/Kg	997	EPA 8270 - S

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 14:40 **System ID** AH06699 **Sample ID** **FO030812**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ933-0803
N ENSIGN & UPRR

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_4
IMS File/Invoice #: 1020.001

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

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
1,3-Dichlorobenzene	<997	µg/Kg	997	EPA 8270 - S
1,4-Dichlorobenzene	<997	µg/Kg	997	EPA 8270 - S
2,4,5-Trichlorophenol	<997	µg/Kg	997	EPA 8270 - S
2,4,6-Trichlorophenol	<997	µg/Kg	997	EPA 8270 - S
2,4-Dichlorophenol	<997	µg/Kg	997	EPA 8270 - S
2,4-Dimethylphenol	<997	µg/Kg	997	EPA 8270 - S
2,4-Dinitrophenol	<4980	µg/Kg	4980	EPA 8270 - S
2,4-Dinitrotoluene	<997	µg/Kg	997	EPA 8270 - S
2,6-Dinitrotoluene	<997	µg/Kg	997	EPA 8270 - S
2-Chloronaphthalene	<249	µg/Kg	249	EPA 8270 - S
2-Chlorophenol	<997	µg/Kg	997	EPA 8270 - S
2-Methylnaphthalene	<249	µg/Kg	249	EPA 8270 - S
2-Methylphenol	<997	µg/Kg	997	EPA 8270 - S
2-Nitroaniline	<997	µg/Kg	997	EPA 8270 - S
2-Nitrophenol	<997	µg/Kg	997	EPA 8270 - S
3,3'-Dichlorobenzidine	<1990	µg/Kg	1990	EPA 8270 - S
3- & 4-Methylphenol	<1990	µg/Kg	1990	EPA 8270 - S
3-Nitroaniline	<997	µg/Kg	997	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<4980	µg/Kg	4980	EPA 8270 - S
4-Bromophenylphenyl ether	<997	µg/Kg	997	EPA 8270 - S
4-Chloro-3-methylphenol	<997	µg/Kg	997	EPA 8270 - S
4-Chloroaniline	<997	µg/Kg	997	EPA 8270 - S
4-Chlorophenylphenyl ether	<997	µg/Kg	997	EPA 8270 - S
4-Nitroaniline	<997	µg/Kg	997	EPA 8270 - S
4-Nitrophenol	<2490	µg/Kg	2490	EPA 8270 - S
Acenaphthene	<249	µg/Kg	249	EPA 8270 - S
Acenaphthylene	<249	µg/Kg	249	EPA 8270 - S
Anthracene	<249	µg/Kg	249	EPA 8270 - S
Benzo(a)anthracene	<249	µg/Kg	249	EPA 8270 - S

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Sample Date/Time 8/12/03 14:40 **System ID** AH06699 **Sample ID** **FO030812**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ933-0803
N ENSIGN & UPRR

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_4
IMS File/Invoice #: 1020.001

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

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
Benzo(a)pyrene	<249	µg/Kg	249	EPA 8270 - S
Benzo(g,h,i)perylene	<249	µg/Kg	249	EPA 8270 - S
Benzofluoranthenes	<249	µg/Kg	249	EPA 8270 - S
Benzoic acid	<4980	µg/Kg	4980	EPA 8270 - S
Benzyl alcohol	<1250	µg/Kg	1250	EPA 8270 - S
Benzyl butyl phthalate	<1250	µg/Kg	1250	EPA 8270 - S
Bis(2-chloroethoxy) methane	<997	µg/Kg	997	EPA 8270 - S
Bis(2-chloroethyl) ether	<997	µg/Kg	997	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<997	µg/Kg	997	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<997	µg/Kg	997	EPA 8270 - S
Chrysene	<249	µg/Kg	249	EPA 8270 - S
Di-n-butyl phthalate	<997	µg/Kg	997	EPA 8270 - S
Di-n-octyl phthalate	<997	µg/Kg	997	EPA 8270 - S
Dibenzo(a,h)anthracene	<249	µg/Kg	249	EPA 8270 - S
Dibenzofuran	<997	µg/Kg	997	EPA 8270 - S
Diethyl phthalate	<997	µg/Kg	997	EPA 8270 - S
Dimethyl phthalate	<997	µg/Kg	997	EPA 8270 - S
Fluoranthene	<249	µg/Kg	249	EPA 8270 - S
Fluorene	<249	µg/Kg	249	EPA 8270 - S
Hexachlorobenzene	<997	µg/Kg	997	EPA 8270 - S
Hexachlorobutadiene	<997	µg/Kg	997	EPA 8270 - S
Hexachlorocyclopentadiene	<997	µg/Kg	997	EPA 8270 - S
Hexachloroethane	<997	µg/Kg	997	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<249	µg/Kg	249	EPA 8270 - S
Isophorone	<997	µg/Kg	997	EPA 8270 - S
N-Nitrosodi-n-propylamine	<997	µg/Kg	997	EPA 8270 - S
N-Nitrosodiphenylamine	<997	µg/Kg	997	EPA 8270 - S
Naphthalene	<249	µg/Kg	249	EPA 8270 - S
Nitrobenzene	<997	µg/Kg	997	EPA 8270 - S

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Sample Date/Time 8/12/03 14:40 **System ID** AH06699 **Sample ID** **FO030812**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ933-0803
N ENSIGN & UPRR

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_4
IMS File/Invoice #: 1020.001

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

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
Pentachlorophenol	<997	µg/Kg	997	EPA 8270 - S
Phenanthrene	<249	µg/Kg	249	EPA 8270 - S
Phenol	<997	µg/Kg	997	EPA 8270 - S
Pyrene	<249	µg/Kg	249	EPA 8270 - S

End of Report for Sample ID: FO030812

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Sample Date/Time 8/13/03 9:50 **System ID** AH06700 **Sample ID** **FO030813**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM155-0803
6235 N BASIN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_5
IMS File/Invoice #: 1020.001

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

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
METALS				
COPPER	331	mg/Kg	0.25	EPA 6020
ZINC	309	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	4.66	mg/Kg	0.50	EPA 6020
CADMIUM	3.30	mg/Kg	0.10	EPA 6020
CHROMIUM	73.5	mg/Kg	0.50	EPA 6020
LEAD	106	mg/Kg	0.10	EPA 6020
MERCURY	0.060	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	919	mg/Kg	500	NWTPH-Dx
DIESEL	<250	mg/Kg	250	NWTPH-Dx
KEROSENE	<250	mg/Kg	250	NWTPH-Dx
MOTOR OIL	2130	mg/Kg	500	NWTPH-Dx
NWTPH-HCID				
DIESEL	<50	mg/Kg	50	NWTPH-HCID
GASOLINE	<20	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	<100	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	119	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	10500	mg/Kg	45.5	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<2.3	µg/Kg	2.3	EPA 8081
4,4'-DDE	<2.3	µg/Kg	2.3	EPA 8081

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Sample Date/Time 8/13/03 9:50 **System ID** AH06700 **Sample ID** **FO030813**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM155-0803
6235 N BASIN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_5
IMS File/Invoice #: 1020.001

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

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
4,4'-DDT	<2.3	µg/Kg	2.3	EPA 8081
Aldrin	<1.15	µg/Kg	1.15	EPA 8081
Alpha-BHC	<1.15	µg/Kg	1.15	EPA 8081
Alpha-Chlordane	<1.15	µg/Kg	1.15	EPA 8081
Beta-BHC	<1.15	µg/Kg	1.15	EPA 8081
Delta-BHC	<1.15	µg/Kg	1.15	EPA 8081
Dieldrin	<2.3	µg/Kg	2.3	EPA 8081
Endosulfan I	<1.15	µg/Kg	1.15	EPA 8081
Endosulfan II	<2.3	µg/Kg	2.3	EPA 8081
Endosulfan Sulfate	<2.3	µg/Kg	2.3	EPA 8081
Endrin	<2.3	µg/Kg	2.3	EPA 8081
Endrin Aldehyde	<2.3	µg/Kg	2.3	EPA 8081
Endrin Ketone	<2.3	µg/Kg	2.3	EPA 8081
Gamma-BHC(Lindane)	<1.15	µg/Kg	1.15	EPA 8081
Gamma-Chlordane	<1.15	µg/Kg	1.15	EPA 8081
Heptachlor	<1.15	µg/Kg	1.15	EPA 8081
Heptachlor Epoxide	<1.15	µg/Kg	1.15	EPA 8081
Methoxychlor	<11.5	µg/Kg	11.5	EPA 8081
PCB 1016	<11.4	µg/Kg	11.4	EPA 8081
PCB 1221	<22.8	µg/Kg	22.8	EPA 8081
PCB 1232	<11.4	µg/Kg	11.4	EPA 8081
PCB 1242	<11.4	µg/Kg	11.4	EPA 8081
PCB 1248	<11.4	µg/Kg	11.4	EPA 8081
PCB 1254	29.3	µg/Kg	11.4	EPA 8081
PCB 1260	27.6	µg/Kg	11.4	EPA 8081
Toxaphene	<115	µg/Kg	115	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<313	µg/Kg	313	EPA 8270 - S
1,2-Dichlorobenzene	<313	µg/Kg	313	EPA 8270 - S

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Sample Date/Time 8/13/03 9:50 **System ID** AH06700 **Sample ID** **FO030813**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM155-0803
6235 N BASIN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_5
IMS File/Invoice #: 1020.001

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

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
1,3-Dichlorobenzene	<313	µg/Kg	313	EPA 8270 - S
1,4-Dichlorobenzene	<313	µg/Kg	313	EPA 8270 - S
2,4,5-Trichlorophenol	<313	µg/Kg	313	EPA 8270 - S
2,4,6-Trichlorophenol	<313	µg/Kg	313	EPA 8270 - S
2,4-Dichlorophenol	<313	µg/Kg	313	EPA 8270 - S
2,4-Dimethylphenol	<313	µg/Kg	313	EPA 8270 - S
2,4-Dinitrophenol	<1560	µg/Kg	1560	EPA 8270 - S
2,4-Dinitrotoluene	<313	µg/Kg	313	EPA 8270 - S
2,6-Dinitrotoluene	<313	µg/Kg	313	EPA 8270 - S
2-Chloronaphthalene	<78.2	µg/Kg	78.2	EPA 8270 - S
2-Chlorophenol	<313	µg/Kg	313	EPA 8270 - S
2-Methylnaphthalene	<78.2	µg/Kg	78.2	EPA 8270 - S
2-Methylphenol	<313	µg/Kg	313	EPA 8270 - S
2-Nitroaniline	<313	µg/Kg	313	EPA 8270 - S
2-Nitrophenol	<313	µg/Kg	313	EPA 8270 - S
3,3'-Dichlorobenzidine	<625	µg/Kg	625	EPA 8270 - S
3- & 4-Methylphenol	<625	µg/Kg	625	EPA 8270 - S
3-Nitroaniline	<313	µg/Kg	313	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1560	µg/Kg	1560	EPA 8270 - S
4-Bromophenylphenyl ether	<313	µg/Kg	313	EPA 8270 - S
4-Chloro-3-methylphenol	<313	µg/Kg	313	EPA 8270 - S
4-Chloroaniline	<313	µg/Kg	313	EPA 8270 - S
4-Chlorophenylphenyl ether	<313	µg/Kg	313	EPA 8270 - S
4-Nitroaniline	<313	µg/Kg	313	EPA 8270 - S
4-Nitrophenol	<782	µg/Kg	782	EPA 8270 - S
Acenaphthene	<78.2	µg/Kg	78.2	EPA 8270 - S
Acenaphthylene	<78.2	µg/Kg	78.2	EPA 8270 - S
Anthracene	85.2	µg/Kg	78.2	EPA 8270 - S
Benzo(a)anthracene	86.8	µg/Kg	78.2	EPA 8270 - S

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Sample Date/Time 8/13/03 9:50 **System ID** AH06700 **Sample ID** **FO030813**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM155-0803
6235 N BASIN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_5
IMS File/Invoice #: 1020.001

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

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
Benzo(a)pyrene	<78.2	µg/Kg	78.2	EPA 8270 - S
Benzo(g,h,i)perylene	<78.2	µg/Kg	78.2	EPA 8270 - S
Benzofluoranthenes	<78.2	µg/Kg	78.2	EPA 8270 - S
Benzoic acid	<1560	µg/Kg	1560	EPA 8270 - S
Benzyl alcohol	<391	µg/Kg	391	EPA 8270 - S
Benzyl butyl phthalate	<391	µg/Kg	391	EPA 8270 - S
Bis(2-chloroethoxy) methane	<313	µg/Kg	313	EPA 8270 - S
Bis(2-chloroethyl) ether	<313	µg/Kg	313	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<313	µg/Kg	313	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1340	µg/Kg	313	EPA 8270 - S
Chrysene	142	µg/Kg	78.2	EPA 8270 - S
Di-n-butyl phthalate	<313	µg/Kg	313	EPA 8270 - S
Di-n-octyl phthalate	<313	µg/Kg	313	EPA 8270 - S
Dibenzo(a,h)anthracene	<78.2	µg/Kg	78.2	EPA 8270 - S
Dibenzofuran	<313	µg/Kg	313	EPA 8270 - S
Diethyl phthalate	<313	µg/Kg	313	EPA 8270 - S
Dimethyl phthalate	<313	µg/Kg	313	EPA 8270 - S
Fluoranthene	217	µg/Kg	78.2	EPA 8270 - S
Fluorene	<78.2	µg/Kg	78.2	EPA 8270 - S
Hexachlorobenzene	<313	µg/Kg	313	EPA 8270 - S
Hexachlorobutadiene	<313	µg/Kg	313	EPA 8270 - S
Hexachlorocyclopentadiene	<313	µg/Kg	313	EPA 8270 - S
Hexachloroethane	<313	µg/Kg	313	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<78.2	µg/Kg	78.2	EPA 8270 - S
Isophorone	<313	µg/Kg	313	EPA 8270 - S
N-Nitrosodi-n-propylamine	<313	µg/Kg	313	EPA 8270 - S
N-Nitrosodiphenylamine	<313	µg/Kg	313	EPA 8270 - S
Naphthalene	<78.2	µg/Kg	78.2	EPA 8270 - S
Nitrobenzene	<313	µg/Kg	313	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

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Sample Date/Time 8/13/03 9:50 **System ID** AH06700 **Sample ID** **FO030813**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAM155-0803
6235 N BASIN

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_5
IMS File/Invoice #: 1020.001

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

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
Pentachlorophenol	<313	µg/Kg	313	EPA 8270 - S
Phenanthrene	94.1	µg/Kg	78.2	EPA 8270 - S
Phenol	<313	µg/Kg	313	EPA 8270 - S
Pyrene	252	µg/Kg	78.2	EPA 8270 - S

End of Report for Sample ID: FO030813

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Report Date: 9/15/03

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Laboratory Analysis Report

Sample Date/Time 8/13/03 11:42 **System ID** AH06701 **Sample ID** **FO030814**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ829-0803
N BASIN & N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_6
IMS File/Invoice #: 1020.001

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

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. The result for PCB 1254 is an estimated value below the Practical Quantitation Limit.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	139	mg/Kg	0.25	EPA 6020
ZINC	4340	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	120	mg/Kg	0.50	EPA 6020
CADMIUM	24.8	mg/Kg	0.10	EPA 6020
CHROMIUM	39.3	mg/Kg	0.50	EPA 6020
LEAD	83.5	mg/Kg	0.10	EPA 6020
MERCURY	0.321	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	357	mg/Kg	50	NWTPH-Dx
DIESEL	<25	mg/Kg	25	NWTPH-Dx
KEROSENE	<25	mg/Kg	25	NWTPH-Dx
MOTOR OIL	6990	mg/Kg	500	NWTPH-Dx
NWTPH-HCID				
DIESEL	<50	mg/Kg	50	NWTPH-HCID
GASOLINE	<20	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	<100	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	119	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	31600	mg/Kg	59.4	EPA 9060 MO
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<3.77	µg/Kg	3.77	EPA 8081
4,4'-DDE	<3.77	µg/Kg	3.77	EPA 8081

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/13/03 11:42 **System ID** AH06701 **Sample ID** **FO030814**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ829-0803
N BASIN & N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_6
IMS File/Invoice #: 1020.001

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

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. The result for PCB 1254 is an estimated value below the Practical Quantitation Limit.

Test Parameter	Result	Units	MRL	Method
4,4'-DDT	<3.77	µg/Kg	3.77	EPA 8081
Aldrin	<1.89	µg/Kg	1.89	EPA 8081
Alpha-BHC	<1.89	µg/Kg	1.89	EPA 8081
Alpha-Chlordane	<1.89	µg/Kg	1.89	EPA 8081
Beta-BHC	<1.89	µg/Kg	1.89	EPA 8081
Delta-BHC	<1.89	µg/Kg	1.89	EPA 8081
Dieldrin	<3.77	µg/Kg	3.77	EPA 8081
Endosulfan I	<1.89	µg/Kg	1.89	EPA 8081
Endosulfan II	<3.77	µg/Kg	3.77	EPA 8081
Endosulfan Sulfate	<3.77	µg/Kg	3.77	EPA 8081
Endrin	<3.77	µg/Kg	3.77	EPA 8081
Endrin Aldehyde	<3.77	µg/Kg	3.77	EPA 8081
Endrin Ketone	<3.77	µg/Kg	3.77	EPA 8081
Gamma-BHC(Lindane)	<1.89	µg/Kg	1.89	EPA 8081
Gamma-Chlordane	<1.89	µg/Kg	1.89	EPA 8081
Heptachlor	<1.89	µg/Kg	1.89	EPA 8081
Heptachlor Epoxide	<1.89	µg/Kg	1.89	EPA 8081
Methoxychlor	<18.9	µg/Kg	18.9	EPA 8081
PCB 1016	<18.6	µg/Kg	18.6	EPA 8081
PCB 1221	<37.2	µg/Kg	37.2	EPA 8081
PCB 1232	<18.6	µg/Kg	18.6	EPA 8081
PCB 1242	<18.6	µg/Kg	18.6	EPA 8081
PCB 1248	<18.6	µg/Kg	18.6	EPA 8081
PCB 1254	EST 11.9	µg/Kg	18.6	EPA 8081
PCB 1260	<18.6	µg/Kg	18.6	EPA 8081
Toxaphene	<189	µg/Kg	189	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<494	µg/Kg	494	EPA 8270 - S
1,2-Dichlorobenzene	<494	µg/Kg	494	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/13/03 11:42 **System ID** AH06701 **Sample ID** **FO030814**

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Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ829-0803
N BASIN & N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_6
IMS File/Invoice #: 1020.001

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

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. The result for PCB 1254 is an estimated value below the Practical Quantitation Limit.

Test Parameter	Result	Units	MRL	Method
1,3-Dichlorobenzene	<494	µg/Kg	494	EPA 8270 - S
1,4-Dichlorobenzene	<494	µg/Kg	494	EPA 8270 - S
2,4,5-Trichlorophenol	<494	µg/Kg	494	EPA 8270 - S
2,4,6-Trichlorophenol	<494	µg/Kg	494	EPA 8270 - S
2,4-Dichlorophenol	<494	µg/Kg	494	EPA 8270 - S
2,4-Dimethylphenol	<494	µg/Kg	494	EPA 8270 - S
2,4-Dinitrophenol	<2470	µg/Kg	2470	EPA 8270 - S
2,4-Dinitrotoluene	<494	µg/Kg	494	EPA 8270 - S
2,6-Dinitrotoluene	<494	µg/Kg	494	EPA 8270 - S
2-Chloronaphthalene	<124	µg/Kg	124	EPA 8270 - S
2-Chlorophenol	<494	µg/Kg	494	EPA 8270 - S
2-Methylnaphthalene	<124	µg/Kg	124	EPA 8270 - S
2-Methylphenol	<494	µg/Kg	494	EPA 8270 - S
2-Nitroaniline	<494	µg/Kg	494	EPA 8270 - S
2-Nitrophenol	<494	µg/Kg	494	EPA 8270 - S
3,3'-Dichlorobenzidine	<988	µg/Kg	988	EPA 8270 - S
3- & 4-Methylphenol	<988	µg/Kg	988	EPA 8270 - S
3-Nitroaniline	<494	µg/Kg	494	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<2470	µg/Kg	2470	EPA 8270 - S
4-Bromophenylphenyl ether	<494	µg/Kg	494	EPA 8270 - S
4-Chloro-3-methylphenol	<494	µg/Kg	494	EPA 8270 - S
4-Chloroaniline	<494	µg/Kg	494	EPA 8270 - S
4-Chlorophenylphenyl ether	<494	µg/Kg	494	EPA 8270 - S
4-Nitroaniline	<494	µg/Kg	494	EPA 8270 - S
4-Nitrophenol	<1240	µg/Kg	1240	EPA 8270 - S
Acenaphthene	<124	µg/Kg	124	EPA 8270 - S
Acenaphthylene	<124	µg/Kg	124	EPA 8270 - S
Anthracene	<124	µg/Kg	124	EPA 8270 - S
Benzo(a)anthracene	<124	µg/Kg	124	EPA 8270 - S

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Sample Date/Time 8/13/03 11:42 **System ID** AH06701 **Sample ID** **FO030814**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ829-0803
N BASIN & N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_6
IMS File/Invoice #: 1020.001

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

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. The result for PCB 1254 is an estimated value below the Practical Quantitation Limit.

Test Parameter	Result	Units	MRL	Method
Benzo(a)pyrene	<124	µg/Kg	124	EPA 8270 - S
Benzo(g,h,i)perylene	<124	µg/Kg	124	EPA 8270 - S
Benzofluoranthenes	<124	µg/Kg	124	EPA 8270 - S
Benzoic acid	<2470	µg/Kg	2470	EPA 8270 - S
Benzyl alcohol	<618	µg/Kg	618	EPA 8270 - S
Benzyl butyl phthalate	<618	µg/Kg	618	EPA 8270 - S
Bis(2-chloroethoxy) methane	<494	µg/Kg	494	EPA 8270 - S
Bis(2-chloroethyl) ether	<494	µg/Kg	494	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<494	µg/Kg	494	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	1170	µg/Kg	494	EPA 8270 - S
Chrysene	<124	µg/Kg	124	EPA 8270 - S
Di-n-butyl phthalate	<494	µg/Kg	494	EPA 8270 - S
Di-n-octyl phthalate	<494	µg/Kg	494	EPA 8270 - S
Dibenzo(a,h)anthracene	<124	µg/Kg	124	EPA 8270 - S
Dibenzofuran	<494	µg/Kg	494	EPA 8270 - S
Diethyl phthalate	<494	µg/Kg	494	EPA 8270 - S
Dimethyl phthalate	<494	µg/Kg	494	EPA 8270 - S
Fluoranthene	<124	µg/Kg	124	EPA 8270 - S
Fluorene	<124	µg/Kg	124	EPA 8270 - S
Hexachlorobenzene	<494	µg/Kg	494	EPA 8270 - S
Hexachlorobutadiene	<494	µg/Kg	494	EPA 8270 - S
Hexachlorocyclopentadiene	<494	µg/Kg	494	EPA 8270 - S
Hexachloroethane	<494	µg/Kg	494	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<124	µg/Kg	124	EPA 8270 - S
Isophorone	<494	µg/Kg	494	EPA 8270 - S
N-Nitrosodi-n-propylamine	<494	µg/Kg	494	EPA 8270 - S
N-Nitrosodiphenylamine	<494	µg/Kg	494	EPA 8270 - S
Naphthalene	<124	µg/Kg	124	EPA 8270 - S
Nitrobenzene	<494	µg/Kg	494	EPA 8270 - S

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Sample Date/Time 8/13/03 11:42 **System ID** AH06701 **Sample ID** **FO030814**

Page: 5

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-AAJ829-0803
N BASIN & N FATHOM

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: M1_6
IMS File/Invoice #: 1020.001

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

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. The result for PCB 1254 is an estimated value below the Practical Quantitation Limit.

Test Parameter	Result	Units	MRL	Method
Pentachlorophenol	<494	µg/Kg	494	EPA 8270 - S
Phenanthrene	<124	µg/Kg	124	EPA 8270 - S
Phenol	<494	µg/Kg	494	EPA 8270 - S
Pyrene	<124	µg/Kg	124	EPA 8270 - S

End of Report for Sample ID: FO030814

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Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06702 **Sample ID** **FO030815**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-XXY101-0803 DUPLICATE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

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

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. The surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons.

Test Parameter	Result	Units	MRL	Method
METALS				
COPPER	171	mg/Kg	0.25	EPA 6020
ZINC	977	mg/Kg	0.50	EPA 6020
RCRA METALS (5) BY EPA 6020				
ARSENIC	3.38	mg/Kg	0.50	EPA 6020
CADMIUM	38.7	mg/Kg	0.10	EPA 6020
CHROMIUM	420	mg/Kg	0.50	EPA 6020
LEAD	863	mg/Kg	0.10	EPA 6020
MERCURY	0.065	mg/Kg	0.010	EPA 6020
NWTPH-Dx				
#6 FUEL OIL	5300	mg/Kg	500	NWTPH-Dx
DIESEL	<250	mg/Kg	250	NWTPH-Dx
KEROSENE	<250	mg/Kg	250	NWTPH-Dx
MOTOR OIL	9230	mg/Kg	500	NWTPH-Dx
NWTPH-HCID				
DIESEL	DET	mg/Kg	50	NWTPH-HCID
GASOLINE	DET	mg/Kg	20	NWTPH-HCID
HEAVY FUEL OIL	DET	mg/Kg	100	NWTPH-HCID
LUBE OIL	DET	mg/Kg	100	NWTPH-HCID
OTHER	<100	mg/Kg	100	NWTPH-HCID
Surrogate Recovery (%)	Not Reportable	mg/Kg		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	32100	mg/Kg	46.9	EPA 9060 MO
NWTPH-Gx				
GASOLINE RANGE HYDROCARBONS	285	mg/Kg	5.16	NWTPH-Gx
PESTICIDES/PCB'S BY EPA 8081				

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Sample Date/Time 8/12/03 13:45 **System ID** AH06702 **Sample ID** **FO030815**

Page: 2

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-XXY101-0803 DUPLICATE
Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: DUP
IMS File/Invoice #: 1020.001
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT
Collected By: MJH/DJH

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. The surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons.

Test Parameter	Result	Units	MRL	Method
4,4'-DDD	<2.54	µg/Kg	2.54	EPA 8081
4,4'-DDE	<2.54	µg/Kg	2.54	EPA 8081
4,4'-DDT	<2.54	µg/Kg	2.54	EPA 8081
Aldrin	<1.27	µg/Kg	1.27	EPA 8081
Alpha-BHC	<1.27	µg/Kg	1.27	EPA 8081
Alpha-Chlordane	<1.27	µg/Kg	1.27	EPA 8081
Beta-BHC	<1.27	µg/Kg	1.27	EPA 8081
Delta-BHC	<1.27	µg/Kg	1.27	EPA 8081
Dieldrin	<2.54	µg/Kg	2.54	EPA 8081
Endosulfan I	<1.27	µg/Kg	1.27	EPA 8081
Endosulfan II	<2.54	µg/Kg	2.54	EPA 8081
Endosulfan Sulfate	<2.54	µg/Kg	2.54	EPA 8081
Endrin	<2.54	µg/Kg	2.54	EPA 8081
Endrin Aldehyde	<2.54	µg/Kg	2.54	EPA 8081
Endrin Ketone	<2.54	µg/Kg	2.54	EPA 8081
Gamma-BHC(Lindane)	<1.27	µg/Kg	1.27	EPA 8081
Gamma-Chlordane	<1.27	µg/Kg	1.27	EPA 8081
Heptachlor	<1.27	µg/Kg	1.27	EPA 8081
Heptachlor Epoxide	<1.27	µg/Kg	1.27	EPA 8081
Methoxychlor	<12.7	µg/Kg	12.7	EPA 8081
PCB 1016	<12.3	µg/Kg	12.3	EPA 8081
PCB 1221	<24.6	µg/Kg	24.6	EPA 8081
PCB 1232	<12.3	µg/Kg	12.3	EPA 8081
PCB 1242	<12.3	µg/Kg	12.3	EPA 8081
PCB 1248	<12.3	µg/Kg	12.3	EPA 8081
PCB 1254	378	µg/Kg	12.3	EPA 8081
PCB 1260	123	µg/Kg	12.3	EPA 8081
Toxaphene	<127	µg/Kg	127	EPA 8081

SEMI-VOLATILE ORGANICS

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Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06702 **Sample ID** **FO030815**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-XXY101-0803 DUPLICATE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

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

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. The surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons.

Test Parameter	Result	Units	MRL	Method
1,2,4-Trichlorobenzene	<337	µg/Kg	337	EPA 8270 - S
1,2-Dichlorobenzene	<337	µg/Kg	337	EPA 8270 - S
1,3-Dichlorobenzene	<337	µg/Kg	337	EPA 8270 - S
1,4-Dichlorobenzene	<337	µg/Kg	337	EPA 8270 - S
2,4,5-Trichlorophenol	<337	µg/Kg	337	EPA 8270 - S
2,4,6-Trichlorophenol	<337	µg/Kg	337	EPA 8270 - S
2,4-Dichlorophenol	<337	µg/Kg	337	EPA 8270 - S
2,4-Dimethylphenol	<337	µg/Kg	337	EPA 8270 - S
2,4-Dinitrophenol	<1680	µg/Kg	1680	EPA 8270 - S
2,4-Dinitrotoluene	<337	µg/Kg	337	EPA 8270 - S
2,6-Dinitrotoluene	<337	µg/Kg	337	EPA 8270 - S
2-Chloronaphthalene	<84.2	µg/Kg	84.2	EPA 8270 - S
2-Chlorophenol	<337	µg/Kg	337	EPA 8270 - S
2-Methylnaphthalene	3800	µg/Kg	84.2	EPA 8270 - S
2-Methylphenol	<337	µg/Kg	337	EPA 8270 - S
2-Nitroaniline	<337	µg/Kg	337	EPA 8270 - S
2-Nitrophenol	<337	µg/Kg	337	EPA 8270 - S
3,3'-Dichlorobenzidine	<674	µg/Kg	674	EPA 8270 - S
3- & 4-Methylphenol	<674	µg/Kg	674	EPA 8270 - S
3-Nitroaniline	<337	µg/Kg	337	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<1680	µg/Kg	1680	EPA 8270 - S
4-Bromophenylphenyl ether	<337	µg/Kg	337	EPA 8270 - S
4-Chloro-3-methylphenol	<337	µg/Kg	337	EPA 8270 - S
4-Chloroaniline	<337	µg/Kg	337	EPA 8270 - S
4-Chlorophenylphenyl ether	<337	µg/Kg	337	EPA 8270 - S
4-Nitroaniline	<337	µg/Kg	337	EPA 8270 - S
4-Nitrophenol	<842	µg/Kg	842	EPA 8270 - S
Acenaphthene	<84.2	µg/Kg	84.2	EPA 8270 - S
Acenaphthylene	<84.2	µg/Kg	84.2	EPA 8270 - S

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Sample Date/Time 8/12/03 13:45 **System ID** AH06702 **Sample ID** **FO030815**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-XXY101-0803 DUPLICATE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

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

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. The surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons.

Test Parameter	Result	Units	MRL	Method
Anthracene	<84.2	µg/Kg	84.2	EPA 8270 - S
Benzo(a)anthracene	<84.2	µg/Kg	84.2	EPA 8270 - S
Benzo(a)pyrene	<84.2	µg/Kg	84.2	EPA 8270 - S
Benzo(g,h,i)perylene	<84.2	µg/Kg	84.2	EPA 8270 - S
Benzofluoranthenes	<84.2	µg/Kg	84.2	EPA 8270 - S
Benzoic acid	<1680	µg/Kg	1680	EPA 8270 - S
Benzyl alcohol	<421	µg/Kg	421	EPA 8270 - S
Benzyl butyl phthalate	<421	µg/Kg	421	EPA 8270 - S
Bis(2-chloroethoxy) methane	<337	µg/Kg	337	EPA 8270 - S
Bis(2-chloroethyl) ether	<337	µg/Kg	337	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<337	µg/Kg	337	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	16500	µg/Kg	337	EPA 8270 - S
Chrysene	<84.2	µg/Kg	84.2	EPA 8270 - S
Di-n-butyl phthalate	1020	µg/Kg	337	EPA 8270 - S
Di-n-octyl phthalate	<337	µg/Kg	337	EPA 8270 - S
Dibenzo(a,h)anthracene	<84.2	µg/Kg	84.2	EPA 8270 - S
Dibenzofuran	<337	µg/Kg	337	EPA 8270 - S
Diethyl phthalate	<337	µg/Kg	337	EPA 8270 - S
Dimethyl phthalate	<337	µg/Kg	337	EPA 8270 - S
Fluoranthene	900	µg/Kg	84.2	EPA 8270 - S
Fluorene	<84.2	µg/Kg	84.2	EPA 8270 - S
Hexachlorobenzene	<337	µg/Kg	337	EPA 8270 - S
Hexachlorobutadiene	<337	µg/Kg	337	EPA 8270 - S
Hexachlorocyclopentadiene	<337	µg/Kg	337	EPA 8270 - S
Hexachloroethane	<337	µg/Kg	337	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<84.2	µg/Kg	84.2	EPA 8270 - S
Isophorone	<337	µg/Kg	337	EPA 8270 - S
N-Nitrosodi-n-propylamine	<337	µg/Kg	337	EPA 8270 - S
N-Nitrosodiphenylamine	<337	µg/Kg	337	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 13:45 **System ID** AH06702 **Sample ID** **FO030815**

Page: 5

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: IL-M1-XXY101-0803 DUPLICATE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

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

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. The surrogate recovery for NWTPH-HCID is not reportable due to matrix interference from the petroleum hydrocarbons.

Test Parameter	Result	Units	MRL	Method
Naphthalene	510	µg/Kg	84.2	EPA 8270 - S
Nitrobenzene	<337	µg/Kg	337	EPA 8270 - S
Pentachlorophenol	<337	µg/Kg	337	EPA 8270 - S
Phenanthrene	2640	µg/Kg	84.2	EPA 8270 - S
Phenol	<337	µg/Kg	337	EPA 8270 - S
Pyrene	1030	µg/Kg	84.2	EPA 8270 - S

End of Report for Sample ID: FO030815

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 7:50 **System ID** AH06703 **Sample ID** **FO030816**

Page: 1

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: RINSATE SAMPLE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

Sample Type: GRAB
Sample Matrix: DIWTR
Collected By: MJH/DJH

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
METALS				
MERCURY	<0.0050	µg/L	0.005	EPA 200.8
METALS BY ICP-MS (TOTAL) - 6				
ARSENIC	<0.10	µg/L	0.1	EPA 200.8
CADMIUM	<0.10	µg/L	0.1	EPA 200.8
CHROMIUM	<0.40	µg/L	0.4	EPA 200.8
COPPER	<0.20	µg/L	0.2	EPA 200.8
LEAD	<0.10	µg/L	0.1	EPA 200.8
ZINC	<0.50	µg/L	0.5	EPA 200.8
NWTPH-HCID				
DIESEL	<0.63	mg/L	0.63	NWTPH-HCID
GASOLINE	<0.25	mg/L	0.25	NWTPH-HCID
HEAVY FUEL OIL	<0.63	mg/L	0.63	NWTPH-HCID
LUBE OIL	<0.63	mg/L	0.63	NWTPH-HCID
OTHER	<0.63	mg/L	0.63	NWTPH-HCID
Surrogate Recovery (%)	105	mg/L		NWTPH-HCID
OUTSIDE				
TOTAL ORGANIC CARBON	0.624	mg/L	0.35	EPA 415.1
NWTPH-Dx				
DIESEL RANGE HYDROCARBONS	<0.241	mg/L	0.241	NWTPH-Dx
HEAVY OIL RANGE HYDROCARBONS	<0.482	mg/L	0.482	NWTPH-Dx
PESTICIDES/PCB'S BY EPA 8081				
4,4'-DDD	<0.00384	µg/L	0.00384	EPA 8081
4,4'-DDE	<0.00384	µg/L	0.00384	EPA 8081
4,4'-DDT	<0.00384	µg/L	0.00384	EPA 8081
Aldrin	<0.00192	µg/L	0.00192	EPA 8081

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 7:50 **System ID** AH06703 **Sample ID** **FO030816**

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: RINSATE SAMPLE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

Sample Type: GRAB
Sample Matrix: DIWTR
Collected By: MJH/DJH

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
Alpha-BHC	<0.00192	µg/L	0.00192	EPA 8081
Alpha-Chlordane	<0.00192	µg/L	0.00192	EPA 8081
Beta-BHC	<0.00384	µg/L	0.00384	EPA 8081
Delta-BHC	<0.00192	µg/L	0.00192	EPA 8081
Dieldrin	<0.00384	µg/L	0.00384	EPA 8081
Endosulfan I	<0.00192	µg/L	0.00192	EPA 8081
Endosulfan II	<0.00384	µg/L	0.00384	EPA 8081
Endosulfan Sulfate	<0.00384	µg/L	0.00384	EPA 8081
Endrin	<0.00384	µg/L	0.00384	EPA 8081
Endrin Aldehyde	<0.00384	µg/L	0.00384	EPA 8081
Endrin Ketone	<0.00384	µg/L	0.00384	EPA 8081
Gamma-BHC(Lindane)	<0.00192	µg/L	0.00192	EPA 8081
Gamma-Chlordane	<0.00192	µg/L	0.00192	EPA 8081
Heptachlor	<0.00192	µg/L	0.00192	EPA 8081
Heptachlor Epoxide	<0.00192	µg/L	0.00192	EPA 8081
Methoxychlor	<0.0192	µg/L	0.0192	EPA 8081
PCB 1016	<0.0192	µg/L	0.0192	EPA 8081
PCB 1221	<0.0384	µg/L	0.0384	EPA 8081
PCB 1232	<0.0192	µg/L	0.0192	EPA 8081
PCB 1242	<0.0192	µg/L	0.0192	EPA 8081
PCB 1248	<0.0192	µg/L	0.0192	EPA 8081
PCB 1254	<0.0192	µg/L	0.0192	EPA 8081
PCB 1260	<0.0192	µg/L	0.0192	EPA 8081
Toxaphene	<0.192	µg/L	0.192	EPA 8081
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<0.192	µg/L	0.192	EPA 8270 - S
1,2-Dichlorobenzene	<0.192	µg/L	0.192	EPA 8270 - S
1,3-Dichlorobenzene	<0.192	µg/L	0.192	EPA 8270 - S
1,4-Dichlorobenzene	<0.192	µg/L	0.192	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 7:50 **System ID** AH06703 **Sample ID** **FO030816**

Page: 3

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: RINSATE SAMPLE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

Sample Type: GRAB
Sample Matrix: DIWTR
Collected By: MJH/DJH

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
2,4,5-Trichlorophenol	<0.192	µg/L	0.192	EPA 8270 - S
2,4,6-Trichlorophenol	<0.192	µg/L	0.192	EPA 8270 - S
2,4-Dichlorophenol	<0.192	µg/L	0.192	EPA 8270 - S
2,4-Dimethylphenol	<0.961	µg/L	0.961	EPA 8270 - S
2,4-Dinitrophenol	<0.961	µg/L	0.961	EPA 8270 - S
2,4-Dinitrotoluene	<0.192	µg/L	0.192	EPA 8270 - S
2,6-Dinitrotoluene	<0.192	µg/L	0.192	EPA 8270 - S
2-Chloronaphthalene	<0.048	µg/L	0.048	EPA 8270 - S
2-Chlorophenol	<0.192	µg/L	0.192	EPA 8270 - S
2-Methylnaphthalene	<0.048	µg/L	0.048	EPA 8270 - S
2-Methylphenol	<0.192	µg/L	0.192	EPA 8270 - S
2-Nitroaniline	<0.192	µg/L	0.192	EPA 8270 - S
2-Nitrophenol	<0.192	µg/L	0.192	EPA 8270 - S
3,3'-Dichlorobenzidine	<0.961	µg/L	0.961	EPA 8270 - S
3- & 4-Methylphenol	<0.384	µg/L	0.384	EPA 8270 - S
3-Nitroaniline	<0.192	µg/L	0.192	EPA 8270 - S
4,6-Dinitro-2-methylphenol	<0.961	µg/L	0.961	EPA 8270 - S
4-Bromophenylphenyl ether	<0.192	µg/L	0.192	EPA 8270 - S
4-Chloro-3-methylphenol	<0.192	µg/L	0.192	EPA 8270 - S
4-Chloroaniline	<0.288	µg/L	0.288	EPA 8270 - S
4-Chlorophenylphenyl ether	<0.192	µg/L	0.192	EPA 8270 - S
4-Nitroaniline	<0.192	µg/L	0.192	EPA 8270 - S
4-Nitrophenol	<0.961	µg/L	0.961	EPA 8270 - S
Acenaphthene	<0.048	µg/L	0.048	EPA 8270 - S
Acenaphthylene	<0.048	µg/L	0.048	EPA 8270 - S
Anthracene	<0.048	µg/L	0.048	EPA 8270 - S
Benzo(a)anthracene	<0.048	µg/L	0.048	EPA 8270 - S
Benzo(a)pyrene	<0.048	µg/L	0.048	EPA 8270 - S
Benzo(g,h,i)perylene	<0.048	µg/L	0.048	EPA 8270 - S

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Report Date: 9/15/03

Validated By: Signature on File

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 7:50 **System ID** AH06703 **Sample ID** **FO030816**

Page: 4

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: RINSATE SAMPLE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

Sample Type: GRAB
Sample Matrix: DIWTR
Collected By: MJH/DJH

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
Benzofluoranthenes	<0.0961	µg/L	0.0961	EPA 8270 - S
Benzoic acid	<0.961	µg/L	0.961	EPA 8270 - S
Benzyl alcohol	<0.192	µg/L	0.192	EPA 8270 - S
Benzyl butyl phthalate	<0.288	µg/L	0.288	EPA 8270 - S
Bis(2-chloroethoxy) methane	<0.192	µg/L	0.192	EPA 8270 - S
Bis(2-chloroethyl) ether	<0.192	µg/L	0.192	EPA 8270 - S
Bis(2-chloroisopropyl) ether	<0.192	µg/L	0.192	EPA 8270 - S
Bis(2-ethylhexyl) phthalate	<1.44	µg/L	1.44	EPA 8270 - S
Chrysene	<0.048	µg/L	0.048	EPA 8270 - S
Di-n-butyl phthalate	<0.192	µg/L	0.192	EPA 8270 - S
Di-n-octyl phthalate	<0.192	µg/L	0.192	EPA 8270 - S
Dibenzo(a,h)anthracene	<0.048	µg/L	0.048	EPA 8270 - S
Dibenzofuran	<0.192	µg/L	0.192	EPA 8270 - S
Diethyl phthalate	<0.192	µg/L	0.192	EPA 8270 - S
Dimethyl phthalate	<0.192	µg/L	0.192	EPA 8270 - S
Fluoranthene	<0.048	µg/L	0.048	EPA 8270 - S
Fluorene	<0.048	µg/L	0.048	EPA 8270 - S
Hexachlorobenzene	<0.192	µg/L	0.192	EPA 8270 - S
Hexachlorobutadiene	<0.192	µg/L	0.192	EPA 8270 - S
Hexachlorocyclopentadiene	<0.961	µg/L	0.961	EPA 8270 - S
Hexachloroethane	<0.192	µg/L	0.192	EPA 8270 - S
Indeno(1,2,3-cd)pyrene	<0.048	µg/L	0.048	EPA 8270 - S
Isophorone	<0.192	µg/L	0.192	EPA 8270 - S
N-Nitrosodi-n-propylamine	<0.192	µg/L	0.192	EPA 8270 - S
N-Nitrosodiphenylamine	<0.192	µg/L	0.192	EPA 8270 - S
Naphthalene	<0.0576	µg/L	0.0576	EPA 8270 - S
Nitrobenzene	<0.192	µg/L	0.192	EPA 8270 - S
Pentachlorophenol	<0.624	µg/L	0.624	EPA 8270 - S
Phenanthrene	<0.048	µg/L	0.048	EPA 8270 - S

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Report Date: 9/15/03

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 8/12/03 7:50 **System ID** AH06703 **Sample ID** **FO030816**

Page: 5

Proj./Company Name: LOWER HARBOR OUTFALL SED SAMP
Address/Location: RINSATE SAMPLE

Date Received: 8/13/03
Sample Status: COMPLETE AND VALIDATED

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

Sample Type: GRAB
Sample Matrix: DIWTR
Collected By: MJH/DJH

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
Phenol	<0.192	µg/L	0.192	EPA 8270 - S
Pyrene	<0.048	µg/L	0.048	EPA 8270 - S

End of Report for Sample ID: FO030816

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Report Date: 9/15/03

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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: September 11, 2003

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

PROJECT: Lower Harbor Sediment Samples WO# P3H0448

REPORT NUMBER: 115555

TOTAL NUMBER OF PAGES: 143

Enclosed are the test results for eight samples received at STL Seattle on August 19, 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

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
115555-1	FO 030809	08-12-03 09:58	solid
115555-2	FO 030810	08-12-03 10:54	solid
115555-3	FO 030811	08-12-03 13:45	solid
115555-4	FO 030812	08-12-03 14:40	solid
115555-5	FO 030813	08-13-03 09:50	solid
115555-6	FO 030814	08-13-03 11:42	solid
115555-7	FO 030815	08-12-03 13:45	solid
115555-8	FO 030816	08-12-03 07:50	liquid

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

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

ANALYTICAL NARRATIVE

Client: North Creek Analytical

Date: September 10, 2003

Project: Lower Harbor Sediment Samples WO# P3H0448

Lab No.: 115555

Delivered By: Federal Express

Condition of samples upon receipt: Samples were received in good condition. Chain of custody was in order.

SAMPLE PREPARATION AND ANALYSIS

ORGANOCHLORINE Pesticides 8081

Sample 115555-03, 15555005, and 15555-07 have PCB with similar response times as Some pesticide compounds. Results are considered approximate values.

SEMIVOLATILE ORGANICS 8270

Low detection limits were requested for the all samples. Due to background matrix interference we were unable to achieve the low level detection limits.

STL Seattle

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
115555-1	FO 030809	08-12-03 09:58	solid
115555-2	FO 030810	08-12-03 10:54	solid
115555-3	FO 030811	08-12-03 13:45	solid
115555-4	FO 030812	08-12-03 14:40	solid
115555-5	FO 030813	08-13-03 09:50	solid
115555-6	FO 030814	08-13-03 11:42	solid
115555-7	FO 030815	08-12-03 13:45	solid
115555-8	FO 030816	08-12-03 07:50	liquid

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030811
Lab ID:	115555-03
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	73.74
Dilution Factor	1

Volatile Petroleum Products by WSDOE Method NWTPH-Gx Modified

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Trifluorotoluene	69.8		50	150
Bromofluorobenzene	181	X9	50	150
Pentafluorobenzene	71.9		50	150

Sample results are on a dry weight basis.

Analyte	**Result (mg/kg)**	**PQL**	**Flags**
Gasoline by NWTPH-G	221	5.14	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030815
Lab ID:	115555-07
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	76.74
Dilution Factor	1

Volatile Petroleum Products by WSDOE Method NWTPH-Gx Modified

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Trifluorotoluene	73.2		50	150
Bromofluorobenzene	207	X9	50	150
Pentafluorobenzene	71.4		50	150

Sample results are on a dry weight basis.

Analyte	**Result (mg/kg)**	**PQL**	**Flags**
Gasoline by NWTPH-G	285	5.16	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030809
Lab ID:	115555-01
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	26.73
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
2 - Fluorophenol	107		35	144
Phenol - d5	126		39	140
Nitrobenzene - d5	117		37	156
2 - Fluorobiphenyl	94.5		39	145
2,4,6 - Tribromophenol	95.1		25	148
p - Terphenyl - d14	120		39	158

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MRL	Flags
Phenol	ND	976	488	
bis(2-Chloroethyl)ether	ND	976	488	
2-Chlorophenol	ND	976	488	
1,3-Dichlorobenzene	ND	976	488	
1,4-Dichlorobenzene	ND	976	488	
Benzyl Alcohol	ND	1220	610	
1,2-Dichlorobenzene	ND	976	488	
2-Methylphenol	ND	976	488	
bis(2-Chloroisopropyl)ether	ND	976	488	
3-&4-Methylphenol	ND	1950	976	
N-nitroso-di-n-propylamine	ND	976	488	
Hexachloroethane	ND	976	488	
Nitrobenzene	ND	976	488	
Isophorone	ND	976	488	
2-Nitrophenol	ND	976	488	
2,4-Dimethylphenol	ND	976	488	
Benzoic Acid	ND	4880	2440	
bis(2-Chloroethoxy)methane	ND	976	488	
2,4-Dichlorophenol	ND	976	488	
1,2,4-Trichlorobenzene	ND	976	488	
Naphthalene	ND	244	122	
4-Chloroaniline	ND	976	488	
Hexachlorobutadiene	ND	976	488	
4-Chloro-3-methylphenol	ND	976	488	
2-Methylnaphthalene	ND	244	122	
Hexachlorocyclopentadiene	ND	976	488	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-01 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		976	488
2,4,5-Trichlorophenol	ND		976	488
2-Chloronaphthalene	ND		244	122
2-Nitroaniline	ND		976	488
Dimethylphthalate	ND		976	488
Acenaphthylene	ND		244	122
2,6-Dinitrotoluene	ND		976	488
3-Nitroaniline	ND		976	488
Acenaphthene	ND		244	122
2,4-Dinitrophenol	ND		4880	2440
4-Nitrophenol	ND		2440	1220
Dibenzofuran	ND		976	488
2,4-Dinitrotoluene	ND		976	488
Diethylphthalate	ND		976	488
4-Chlorophenylphenylether	ND		976	488
Fluorene	ND		244	122
4-Nitroaniline	ND		976	488
4,6-Dinitro-2-methylphenol	ND		4880	2440
N-Nitrosodiphenylamine	ND		976	488
4-Bromophenylphenylether	ND		976	488
Hexachlorobenzene	ND		976	488
Pentachlorophenol	ND		976	488
Phenanthrene	ND		244	122
Anthracene	ND		244	122
Di-n-butylphthalate	ND		976	488
Fluoranthene	ND		244	122
Pyrene	ND		244	122
Butylbenzylphthalate	ND		1220	610
3,3'-Dichlorobenzidine	ND		1950	976
Benzo(a)anthracene	ND		244	122
Chrysene	ND		244	122
bis(2-Ethylhexyl)phthalate		1330	976	488
Di-n-octylphthalate	ND		976	488
Benzofluoranthenes	ND		244	122
Benzo(a)pyrene	ND		244	122
Indeno(1,2,3-cd)pyrene	ND		244	122
Dibenz(a,h)anthracene	ND		244	122
Benzo(g,h,i)perylene	ND		244	122

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030810
Lab ID:	115555-02
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	36.41
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	121		35	144
Phenol - d5	131		39	140
Nitrobenzene - d5	135		37	156
2 - Fluorobiphenyl	91		39	145
2,4,6 - Tribromophenol	108		25	148
p - Terphenyl - d14	119		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	697	349	
bis(2-Chloroethyl)ether	ND	697	349	
2-Chlorophenol	ND	697	349	
1,3-Dichlorobenzene	ND	697	349	
1,4-Dichlorobenzene	ND	697	349	
Benzyl Alcohol	ND	871	436	
1,2-Dichlorobenzene	ND	697	349	
2-Methylphenol	ND	697	349	
bis(2-Chloroisopropyl)ether	ND	697	349	
3-&4-Methylphenol	ND	1390	697	
N-nitroso-di-n-propylamine	ND	697	349	
Hexachloroethane	ND	697	349	
Nitrobenzene	ND	697	349	
Isophorone	ND	697	349	
2-Nitrophenol	ND	697	349	
2,4-Dimethylphenol	ND	697	349	
Benzoic Acid	ND	3490	1740	
bis(2-Chloroethoxy)methane	ND	697	349	
2,4-Dichlorophenol	ND	697	349	
1,2,4-Trichlorobenzene	ND	697	349	
Naphthalene	ND	174	87.1	
4-Chloroaniline	ND	697	349	
Hexachlorobutadiene	ND	697	349	
4-Chloro-3-methylphenol	ND	697	349	
2-Methylnaphthalene	ND	174	87.1	
Hexachlorocyclopentadiene	ND	697	349	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-02 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		697	349
2,4,5-Trichlorophenol	ND		697	349
2-Chloronaphthalene	ND		174	87.1
2-Nitroaniline	ND		697	349
Dimethylphthalate	ND		697	349
Acenaphthylene	ND		174	87.1
2,6-Dinitrotoluene	ND		697	349
3-Nitroaniline	ND		697	349
Acenaphthene	ND		174	87.1
2,4-Dinitrophenol	ND		3490	1740
4-Nitrophenol	ND		1740	871
Dibenzofuran	ND		697	349
2,4-Dinitrotoluene	ND		697	349
Diethylphthalate	ND		697	349
4-Chlorophenylphenylether	ND		697	349
Fluorene	ND		174	87.1
4-Nitroaniline	ND		697	349
4,6-Dinitro-2-methylphenol	ND		3490	1740
N-Nitrosodiphenylamine	ND		697	349
4-Bromophenylphenylether	ND		697	349
Hexachlorobenzene	ND		697	349
Pentachlorophenol	ND		697	349
Phenanthrene	ND		174	87.1
Anthracene	ND		174	87.1
Di-n-butylphthalate	ND		697	349
Fluoranthene	ND		174	87.1
Pyrene	ND		174	87.1
Butylbenzylphthalate	ND		871	436
3,3'-Dichlorobenzidine	ND		1390	697
Benzo(a)anthracene	ND		174	87.1
Chrysene	ND		174	87.1
bis(2-Ethylhexyl)phthalate		1000	697	349
Di-n-octylphthalate	ND		697	349
Benzofluoranthenes	ND		174	87.1
Benzo(a)pyrene	ND		174	87.1
Indeno(1,2,3-cd)pyrene	ND		174	87.1
Dibenz(a,h)anthracene	ND		174	87.1
Benzo(g,h,i)perylene	ND		174	87.1

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030811
Lab ID:	115555-03
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	73.74
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	119		35	144
Phenol - d5	130		39	140
Nitrobenzene - d5	154		37	156
2 - Fluorobiphenyl	105		39	145
2,4,6 - Tribromophenol	44.4		25	148
p - Terphenyl - d14	98.2		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		345	173	
bis(2-Chloroethyl)ether	ND		345	173	
2-Chlorophenol	ND		345	173	
1,3-Dichlorobenzene	ND		345	173	
1,4-Dichlorobenzene	ND		345	173	
Benzyl Alcohol	ND		431	216	
1,2-Dichlorobenzene	ND		345	173	
2-Methylphenol	ND		345	173	
bis(2-Chloroisopropyl)ether	ND		345	173	
3-&4-Methylphenol	ND		690	345	
N-nitroso-di-n-propylamine	ND		345	173	
Hexachloroethane	ND		345	173	
Nitrobenzene	ND		345	173	
Isophorone	ND		345	173	
2-Nitrophenol	ND		345	173	
2,4-Dimethylphenol	ND		345	173	
Benzoic Acid	ND		1730	863	
bis(2-Chloroethoxy)methane	ND		345	173	
2,4-Dichlorophenol	ND		345	173	
1,2,4-Trichlorobenzene	ND		345	173	
Naphthalene		368	86.3	43.1	
4-Chloroaniline	ND		345	173	
Hexachlorobutadiene	ND		345	173	
4-Chloro-3-methylphenol	ND		345	173	
2-Methylnaphthalene		2380	86.3	43.1	
Hexachlorocyclopentadiene	ND		345	173	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-03 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		345	173	
2,4,5-Trichlorophenol	ND		345	173	
2-Chloronaphthalene	ND		86.3	43.1	
2-Nitroaniline	ND		345	173	
Dimethylphthalate	ND		345	173	
Acenaphthylene	ND		86.3	43.1	
2,6-Dinitrotoluene	ND		345	173	
3-Nitroaniline	ND		345	173	
Acenaphthene	ND		86.3	43.1	
2,4-Dinitrophenol	ND		1730	863	
4-Nitrophenol	ND		863	431	
Dibenzofuran	ND		345	173	
2,4-Dinitrotoluene	ND		345	173	
Diethylphthalate	ND		345	173	
4-Chlorophenylphenylether	ND		345	173	
Fluorene	ND		86.3	43.1	
4-Nitroaniline	ND		345	173	
4,6-Dinitro-2-methylphenol	ND		1730	863	
N-Nitrosodiphenylamine	ND		345	173	
4-Bromophenylphenylether	ND		345	173	
Hexachlorobenzene	ND		345	173	
Pentachlorophenol	ND		345	173	
Phenanthrene		1290	86.3	43.1	
Anthracene	ND		86.3	43.1	
Di-n-butylphthalate	ND		345	173	
Fluoranthene		292	86.3	43.1	
Pyrene		602	86.3	43.1	
Butylbenzylphthalate	ND		431	216	
3,3'-Dichlorobenzidine	ND		690	345	
Benzo(a)anthracene	ND		86.3	43.1	
Chrysene	ND		86.3	43.1	
bis(2-Ethylhexyl)phthalate		14800	345	173	D10
Di-n-octylphthalate	ND		345	173	
Benzofluoranthenes	ND		86.3	43.1	
Benzo(a)pyrene	ND		86.3	43.1	
Indeno(1,2,3-cd)pyrene	ND		86.3	43.1	
Dibenz(a,h)anthracene	ND		86.3	43.1	
Benzo(g,h,i)perylene	ND		86.3	43.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030812
Lab ID:	115555-04
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	25.6
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
2 - Fluorophenol	115		35	144
Phenol - d5	137		39	140
Nitrobenzene - d5	126		37	156
2 - Fluorobiphenyl	92.1		39	145
2,4,6 - Tribromophenol	106		25	148
p - Terphenyl - d14	114		39	158

Sample results are on a dry weight basis.

Analyte		Result (ug/kg)	PQL	MRL	Flags
Phenol	ND		997	498	
bis(2-Chloroethyl)ether	ND		997	498	
2-Chlorophenol	ND		997	498	
1,3-Dichlorobenzene	ND		997	498	
1,4-Dichlorobenzene	ND		997	498	
Benzyl Alcohol	ND		1250	623	
1,2-Dichlorobenzene	ND		997	498	
2-Methylphenol	ND		997	498	
bis(2-Chloroisopropyl)ether	ND		997	498	
3-&4-Methylphenol	ND		1990	997	
N-nitroso-di-n-propylamine	ND		997	498	
Hexachloroethane	ND		997	498	
Nitrobenzene	ND		997	498	
Isophorone	ND		997	498	
2-Nitrophenol	ND		997	498	
2,4-Dimethylphenol	ND		997	498	
Benzoic Acid	ND		4980	2490	
bis(2-Chloroethoxy)methane	ND		997	498	
2,4-Dichlorophenol	ND		997	498	
1,2,4-Trichlorobenzene	ND		997	498	
Naphthalene	ND		249	125	
4-Chloroaniline	ND		997	498	
Hexachlorobutadiene	ND		997	498	
4-Chloro-3-methylphenol	ND		997	498	
2-Methylnaphthalene	ND		249	125	
Hexachlorocyclopentadiene	ND		997	498	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-04 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		997	498
2,4,5-Trichlorophenol	ND		997	498
2-Chloronaphthalene	ND		249	125
2-Nitroaniline	ND		997	498
Dimethylphthalate	ND		997	498
Acenaphthylene	ND		249	125
2,6-Dinitrotoluene	ND		997	498
3-Nitroaniline	ND		997	498
Acenaphthene	ND		249	125
2,4-Dinitrophenol	ND		4980	2490
4-Nitrophenol	ND		2490	1250
Dibenzofuran	ND		997	498
2,4-Dinitrotoluene	ND		997	498
Diethylphthalate	ND		997	498
4-Chlorophenylphenylether	ND		997	498
Fluorene	ND		249	125
4-Nitroaniline	ND		997	498
4,6-Dinitro-2-methylphenol	ND		4980	2490
N-Nitrosodiphenylamine	ND		997	498
4-Bromophenylphenylether	ND		997	498
Hexachlorobenzene	ND		997	498
Pentachlorophenol	ND		997	498
Phenanthrene	ND		249	125
Anthracene	ND		249	125
Di-n-butylphthalate	ND		997	498
Fluoranthene	ND		249	125
Pyrene	ND		249	125
Butylbenzylphthalate	ND		1250	623
3,3'-Dichlorobenzidine	ND		1990	997
Benzo(a)anthracene	ND		249	125
Chrysene	ND		249	125
bis(2-Ethylhexyl)phthalate	ND		997	498
Di-n-octylphthalate	ND		997	498
Benzofluoranthenes	ND		249	125
Benzo(a)pyrene	ND		249	125
Indeno(1,2,3-cd)pyrene	ND		249	125
Dibenz(a,h)anthracene	ND		249	125
Benzo(g,h,i)perylene	ND		249	125

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030813
Lab ID:	115555-05
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	84.79
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	129		35	144
Phenol - d5	155	X9	39	140
Nitrobenzene - d5	120		37	156
2 - Fluorobiphenyl	103		39	145
2,4,6 - Tribromophenol	95.2		25	148
p - Terphenyl - d14	97.6		39	158

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND	313	156	
bis(2-Chloroethyl)ether	ND	313	156	
2-Chlorophenol	ND	313	156	
1,3-Dichlorobenzene	ND	313	156	
1,4-Dichlorobenzene	ND	313	156	
Benzyl Alcohol	ND	391	195	
1,2-Dichlorobenzene	ND	313	156	
2-Methylphenol	ND	313	156	
bis(2-Chloroisopropyl)ether	ND	313	156	
3-&4-Methylphenol	ND	625	313	
N-nitroso-di-n-propylamine	ND	313	156	
Hexachloroethane	ND	313	156	
Nitrobenzene	ND	313	156	
Isophorone	ND	313	156	
2-Nitrophenol	ND	313	156	
2,4-Dimethylphenol	ND	313	156	
Benzoic Acid	ND	1560	782	
bis(2-Chloroethoxy)methane	ND	313	156	
2,4-Dichlorophenol	ND	313	156	
1,2,4-Trichlorobenzene	ND	313	156	
Naphthalene	ND	78.2	39.1	
4-Chloroaniline	ND	313	156	
Hexachlorobutadiene	ND	313	156	
4-Chloro-3-methylphenol	ND	313	156	
2-Methylnaphthalene	ND	78.2	39.1	
Hexachlorocyclopentadiene	ND	313	156	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-05 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		313	156
2,4,5-Trichlorophenol	ND		313	156
2-Chloronaphthalene	ND		78.2	39.1
2-Nitroaniline	ND		313	156
Dimethylphthalate	ND		313	156
Acenaphthylene	ND		78.2	39.1
2,6-Dinitrotoluene	ND		313	156
3-Nitroaniline	ND		313	156
Acenaphthene	ND		78.2	39.1
2,4-Dinitrophenol	ND		1560	782
4-Nitrophenol	ND		782	391
Dibenzofuran	ND		313	156
2,4-Dinitrotoluene	ND		313	156
Diethylphthalate	ND		313	156
4-Chlorophenylphenylether	ND		313	156
Fluorene	ND		78.2	39.1
4-Nitroaniline	ND		313	156
4,6-Dinitro-2-methylphenol	ND		1560	782
N-Nitrosodiphenylamine	ND		313	156
4-Bromophenylphenylether	ND		313	156
Hexachlorobenzene	ND		313	156
Pentachlorophenol	ND		313	156
Phenanthrene		94.1	78.2	39.1
Anthracene		85.2	78.2	39.1
Di-n-butylphthalate	ND		313	156
Fluoranthene		217	78.2	39.1
Pyrene		252	78.2	39.1
Butylbenzylphthalate	ND		391	195
3,3'-Dichlorobenzidine	ND		625	313
Benzo(a)anthracene		86.8	78.2	39.1
Chrysene		142	78.2	39.1
bis(2-Ethylhexyl)phthalate		1340	313	156
Di-n-octylphthalate	ND		313	156
Benzofluoranthenes	ND		78.2	39.1
Benzo(a)pyrene	ND		78.2	39.1
Indeno(1,2,3-cd)pyrene	ND		78.2	39.1
Dibenz(a,h)anthracene	ND		78.2	39.1
Benzo(g,h,i)perylene	ND		78.2	39.1

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030814
Lab ID:	115555-06
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	52.92
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
2 - Fluorophenol	129		35	144
Phenol - d5	140		39	140
Nitrobenzene - d5	118		37	156
2 - Fluorobiphenyl	111		39	145
2,4,6 - Tribromophenol	102		25	148
p - Terphenyl - d14	116		39	158

Sample results are on a dry weight basis.

Analyte	Result (ug/kg)	PQL	MRL	Flags
Phenol	ND	494	247	
bis(2-Chloroethyl)ether	ND	494	247	
2-Chlorophenol	ND	494	247	
1,3-Dichlorobenzene	ND	494	247	
1,4-Dichlorobenzene	ND	494	247	
Benzyl Alcohol	ND	618	309	
1,2-Dichlorobenzene	ND	494	247	
2-Methylphenol	ND	494	247	
bis(2-Chloroisopropyl)ether	ND	494	247	
3-&4-Methylphenol	ND	988	494	
N-nitroso-di-n-propylamine	ND	494	247	
Hexachloroethane	ND	494	247	
Nitrobenzene	ND	494	247	
Isophorone	ND	494	247	
2-Nitrophenol	ND	494	247	
2,4-Dimethylphenol	ND	494	247	
Benzoic Acid	ND	2470	1240	
bis(2-Chloroethoxy)methane	ND	494	247	
2,4-Dichlorophenol	ND	494	247	
1,2,4-Trichlorobenzene	ND	494	247	
Naphthalene	ND	124	61.8	
4-Chloroaniline	ND	494	247	
Hexachlorobutadiene	ND	494	247	
4-Chloro-3-methylphenol	ND	494	247	
2-Methylnaphthalene	ND	124	61.8	
Hexachlorocyclopentadiene	ND	494	247	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-06 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		494	247
2,4,5-Trichlorophenol	ND		494	247
2-Chloronaphthalene	ND		124	61.8
2-Nitroaniline	ND		494	247
Dimethylphthalate	ND		494	247
Acenaphthylene	ND		124	61.8
2,6-Dinitrotoluene	ND		494	247
3-Nitroaniline	ND		494	247
Acenaphthene	ND		124	61.8
2,4-Dinitrophenol	ND		2470	1240
4-Nitrophenol	ND		1240	618
Dibenzofuran	ND		494	247
2,4-Dinitrotoluene	ND		494	247
Diethylphthalate	ND		494	247
4-Chlorophenylphenylether	ND		494	247
Fluorene	ND		124	61.8
4-Nitroaniline	ND		494	247
4,6-Dinitro-2-methylphenol	ND		2470	1240
N-Nitrosodiphenylamine	ND		494	247
4-Bromophenylphenylether	ND		494	247
Hexachlorobenzene	ND		494	247
Pentachlorophenol	ND		494	247
Phenanthrene	ND		124	61.8
Anthracene	ND		124	61.8
Di-n-butylphthalate	ND		494	247
Fluoranthene	ND		124	61.8
Pyrene	ND		124	61.8
Butylbenzylphthalate	ND		618	309
3,3'-Dichlorobenzidine	ND		988	494
Benzo(a)anthracene	ND		124	61.8
Chrysene	ND		124	61.8
bis(2-Ethylhexyl)phthalate		1170	494	247
Di-n-octylphthalate	ND		494	247
Benzofluoranthenes	ND		124	61.8
Benzo(a)pyrene	ND		124	61.8
Indeno(1,2,3-cd)pyrene	ND		124	61.8
Dibenz(a,h)anthracene	ND		124	61.8
Benzo(g,h,i)perylene	ND		124	61.8

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030815
Lab ID:	115555-07
Date Received:	8/19/2003
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	76.74
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
2 - Fluorophenol	123		35	144
Phenol - d5	124		39	140
Nitrobenzene - d5	130		37	156
2 - Fluorobiphenyl	97.6		39	145
2,4,6 - Tribromophenol	41.9		25	148
p - Terphenyl - d14	132		39	158

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Phenol	ND		337	168	
bis(2-Chloroethyl)ether	ND		337	168	
2-Chlorophenol	ND		337	168	
1,3-Dichlorobenzene	ND		337	168	
1,4-Dichlorobenzene	ND		337	168	
Benzyl Alcohol	ND		421	211	
1,2-Dichlorobenzene	ND		337	168	
2-Methylphenol	ND		337	168	
bis(2-Chloroisopropyl)ether	ND		337	168	
3-&4-Methylphenol	ND		674	337	
N-nitroso-di-n-propylamine	ND		337	168	
Hexachloroethane	ND		337	168	
Nitrobenzene	ND		337	168	
Isophorone	ND		337	168	
2-Nitrophenol	ND		337	168	
2,4-Dimethylphenol	ND		337	168	
Benzoic Acid	ND		1680	842	
bis(2-Chloroethoxy)methane	ND		337	168	
2,4-Dichlorophenol	ND		337	168	
1,2,4-Trichlorobenzene	ND		337	168	
Naphthalene		510	84.2	42.1	
4-Chloroaniline	ND		337	168	
Hexachlorobutadiene	ND		337	168	
4-Chloro-3-methylphenol	ND		337	168	
2-Methylnaphthalene		3800	84.2	42.1	
Hexachlorocyclopentadiene	ND		337	168	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-07 continued...

Analyte		Result (ug/kg)	PQL	MRL	
2,4,6-Trichlorophenol	ND		337	168	
2,4,5-Trichlorophenol	ND		337	168	
2-Chloronaphthalene	ND		84.2	42.1	
2-Nitroaniline	ND		337	168	
Dimethylphthalate	ND		337	168	
Acenaphthylene	ND		84.2	42.1	
2,6-Dinitrotoluene	ND		337	168	
3-Nitroaniline	ND		337	168	
Acenaphthene	ND		84.2	42.1	
2,4-Dinitrophenol	ND		1680	842	
4-Nitrophenol	ND		842	421	
Dibenzofuran	ND		337	168	
2,4-Dinitrotoluene	ND		337	168	
Diethylphthalate	ND		337	168	
4-Chlorophenylphenylether	ND		337	168	
Fluorene	ND		84.2	42.1	
4-Nitroaniline	ND		337	168	
4,6-Dinitro-2-methylphenol	ND		1680	842	
N-Nitrosodiphenylamine	ND		337	168	
4-Bromophenylphenylether	ND		337	168	
Hexachlorobenzene	ND		337	168	
Pentachlorophenol	ND		337	168	
Phenanthrene		2640	84.2	42.1	
Anthracene	ND		84.2	42.1	
Di-n-butylphthalate		1020	337	168	
Fluoranthene		900	84.2	42.1	
Pyrene		1030	84.2	42.1	
Butylbenzylphthalate	ND		421	211	
3,3'-Dichlorobenzidine	ND		674	337	
Benzo(a)anthracene	ND		84.2	42.1	
Chrysene	ND		84.2	42.1	
bis(2-Ethylhexyl)phthalate		16500	337	168	D10
Di-n-octylphthalate	ND		337	168	
Benzofluoranthenes	ND		84.2	42.1	
Benzo(a)pyrene	ND		84.2	42.1	
Indeno(1,2,3-cd)pyrene	ND		84.2	42.1	
Dibenz(a,h)anthracene	ND		84.2	42.1	
Benzo(g,h,i)perylene	ND		84.2	42.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030816
Lab ID:	115555-08
Date Received:	8/19/2003
Date Prepared:	8/19/2003
Date Analyzed:	8/20/2003
% Solids	-
Dilution Factor	0.1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	High
2 - Fluorophenol	57.6		10	112
Phenol - d5	37.2		10	85
Nitrobenzene - d5	78		41	155
2 - Fluorobiphenyl	64.5		34	148
2,4,6 - Tribromophenol	81.8		29	159
p - Terphenyl - d14	93		33	172

Analyte	Result (ug/L)	PQL	MRL	Flags
Phenol	ND	0.192	0.0961	
bis(2-Chloroethyl)ether	ND	0.192	0.0961	
2-Chlorophenol	ND	0.192	0.0961	
1,3-Dichlorobenzene	ND	0.192	0.0961	
1,4-Dichlorobenzene	ND	0.192	0.0961	
Benzyl Alcohol	ND	0.192	0.0961	
1,2-Dichlorobenzene	ND	0.192	0.0961	
2-Methylphenol	ND	0.192	0.0961	
bis(2-Chloroisopropyl)ether	ND	0.192	0.0961	
3-&4-Methylphenol	ND	0.384	0.192	
N-nitroso-di-n-propylamine	ND	0.192	0.0961	
Hexachloroethane	ND	0.192	0.0961	
Nitrobenzene	ND	0.192	0.0961	
Isophorone	ND	0.192	0.0961	
2-Nitrophenol	ND	0.192	0.0961	
2,4-Dimethylphenol	ND	0.961	0.48	
Benzoic Acid	ND	0.961	0.48	
bis(2-Chloroethoxy)methane	ND	0.192	0.0961	
2,4-Dichlorophenol	ND	0.192	0.0961	
1,2,4-Trichlorobenzene	ND	0.192	0.0961	
Naphthalene	ND	0.0576	0.0288	
4-Chloroaniline	ND	0.288	0.144	
Hexachlorobutadiene	ND	0.192	0.0961	
4-Chloro-3-methylphenol	ND	0.192	0.0961	
2-Methylnaphthalene	ND	0.048	0.024	
Hexachlorocyclopentadiene	ND	0.961	0.48	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for 115555-08 continued...

Analyte		Result (ug/L)	PQL	MRL	
2,4,6-Trichlorophenol	ND		0.192	0.0961	
2,4,5-Trichlorophenol	ND		0.192	0.0961	
2-Chloronaphthalene	ND		0.048	0.024	
2-Nitroaniline	ND		0.192	0.0961	
Dimethylphthalate	ND		0.192	0.0961	
Acenaphthylene	ND		0.048	0.024	
2,6-Dinitrotoluene	ND		0.192	0.0961	
3-Nitroaniline	ND		0.192	0.0961	
Acenaphthene	ND		0.048	0.024	
2,4-Dinitrophenol	ND		0.961	0.48	
4-Nitrophenol	ND		0.961	0.48	
Dibenzofuran	ND		0.192	0.0961	
2,4-Dinitrotoluene	ND		0.192	0.0961	
Diethylphthalate	ND		0.192	0.0961	
4-Chlorophenylphenylether	ND		0.192	0.0961	
Fluorene	ND		0.048	0.024	
4-Nitroaniline	ND		0.192	0.0961	
4,6-Dinitro-2-methylphenol	ND		0.961	0.48	
N-Nitrosodiphenylamine	ND		0.192	0.0961	
4-Bromophenylphenylether	ND		0.192	0.0961	
Hexachlorobenzene	ND		0.192	0.0961	
Pentachlorophenol	ND		0.624	0.312	
Phenanthrene	ND		0.048	0.024	
Anthracene	ND		0.048	0.024	
Di-n-butylphthalate		0.108	0.192	0.0961	J B1
Fluoranthene	ND		0.048	0.024	
Pyrene	ND		0.048	0.024	
Butylbenzylphthalate	ND		0.288	0.144	
3,3'-Dichlorobenzidine	ND		0.961	0.48	
Benzo(a)anthracene	ND		0.048	0.024	
Chrysene	ND		0.048	0.024	
bis(2-Ethylhexyl)phthalate	ND		1.44	0.72	
Di-n-octylphthalate	ND		0.192	0.0961	
Benzofluoranthenes	ND		0.0961	0.048	
Benzo(a)pyrene	ND		0.048	0.024	
Indeno(1,2,3-cd)pyrene	ND		0.048	0.024	
Dibenz(a,h)anthracene	ND		0.048	0.024	
Benzo(g,h,i)perylene	ND		0.048	0.024	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030816
Lab ID:	115555-08
Date Received:	8/19/2003
Date Prepared:	8/19/2003
Date Analyzed:	8/21/2003
% Solids	-
Dilution Factor	1

Diesel and Motor Oil by NWTPH-Dx Modified

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
o-terphenyl	133		50	150

Analyte		**Result (mg/L)**	**PQL**	**MRL**	**Flags**
#2 Diesel	ND		0.241	0.12	
Motor Oil	ND		0.482	0.241	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030809
Lab ID:	115555-01
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	26.73
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	83.4		72	114
Decachlorobiphenyl	99.3		55	133

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.0346	0.0173	
Aroclor 1221	ND	0.0691	0.0346	
Aroclor 1232	ND	0.0346	0.0173	
Aroclor 1242	ND	0.0346	0.0173	
Aroclor 1248	ND	0.0346	0.0173	
Aroclor 1254	ND	0.0346	0.0173	
Aroclor 1260	ND	0.0346	0.0173	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030810
Lab ID:	115555-02
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	36.41
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	75.3		72	114
Decachlorobiphenyl	93.9		55	133

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.0267	0.0134	
Aroclor 1221	ND	0.0534	0.0267	
Aroclor 1232	ND	0.0267	0.0134	
Aroclor 1242	ND	0.0267	0.0134	
Aroclor 1248	ND	0.0267	0.0134	
Aroclor 1254	ND	0.0267	0.0134	
Aroclor 1260	ND	0.0267	0.0134	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030811
Lab ID:	115555-03
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	73.74
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	62.2	X9	72	114
Decachlorobiphenyl	106		55	133

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.0129	0.00643	
Aroclor 1221	ND	0.0257	0.0129	
Aroclor 1232	ND	0.0129	0.00643	
Aroclor 1242	ND	0.0129	0.00643	
Aroclor 1248	ND	0.0129	0.00643	
Aroclor 1254	0.276	0.0129	0.00643	
Aroclor 1260	0.129	0.0129	0.00643	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030812
Lab ID:	115555-04
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	25.6
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	76.3		72	114
Decachlorobiphenyl	106		55	133

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.0355	0.0178	
Aroclor 1221	ND	0.071	0.0355	
Aroclor 1232	ND	0.0355	0.0178	
Aroclor 1242	ND	0.0355	0.0178	
Aroclor 1248	ND	0.0355	0.0178	
Aroclor 1254	ND	0.0355	0.0178	
Aroclor 1260	ND	0.0355	0.0178	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030813
Lab ID:	115555-05
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	84.79
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	73.4		72	114
Decachlorobiphenyl	95.5		55	133

Sample results are on a dry weight basis.

Analyte		Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND		0.0114	0.00569	
Aroclor 1221	ND		0.0228	0.0114	
Aroclor 1232	ND		0.0114	0.00569	
Aroclor 1242	ND		0.0114	0.00569	
Aroclor 1248	ND		0.0114	0.00569	
Aroclor 1254		0.0293	0.0114	0.00569	
Aroclor 1260		0.0276	0.0114	0.00569	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030814
Lab ID:	115555-06
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	52.92
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	72.6		72	114
Decachlorobiphenyl	81		55	133

Sample results are on a dry weight basis.

Analyte		Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND		0.0186	0.00929	
Aroclor 1221	ND		0.0372	0.0186	
Aroclor 1232	ND		0.0186	0.00929	
Aroclor 1242	ND		0.0186	0.00929	
Aroclor 1248	ND		0.0186	0.00929	
Aroclor 1254		0.0119	0.0186	0.00929	J
Aroclor 1260	ND		0.0186	0.00929	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030815
Lab ID:	115555-07
Date Received:	8/19/03
Date Prepared:	8/20/03
Date Analyzed:	8/21/03
% Solids	76.74
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	58.8	X9	72	114
Decachlorobiphenyl	102		55	133

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.0123	0.00615	
Aroclor 1221	ND	0.0246	0.0123	
Aroclor 1232	ND	0.0123	0.00615	
Aroclor 1242	ND	0.0123	0.00615	
Aroclor 1248	ND	0.0123	0.00615	
Aroclor 1254	0.378	0.0123	0.00615	
Aroclor 1260	0.123	0.0123	0.00615	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030616
Lab ID:	115555-08
Date Received:	8/19/03
Date Prepared:	8/19/03
Date Analyzed:	8/20/03
% Solids	-
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	72.1		42	108
Decachlorobiphenyl	88		45	136

Analyte	Result (ug/L)	PQL	MRL	Flags
Aroclor 1016	ND	0.0192	0.0096	
Aroclor 1221	ND	0.0384	0.0192	
Aroclor 1232	ND	0.0192	0.0096	
Aroclor 1242	ND	0.0192	0.0096	
Aroclor 1248	ND	0.0192	0.0096	
Aroclor 1254	ND	0.0192	0.0096	
Aroclor 1260	ND	0.0192	0.0096	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030816
Lab ID:	115555-08
Date Received:	8/19/2003
Date Prepared:	8/19/2003
Date Analyzed:	8/22/2003
% Solids	-
Dilution Factor	1

Organochlorine Pesticides by USEPA Method 8081A

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	98.8		52	130
Decachlorobiphenyl	104		54	146

Analyte	Result (ug/L)	PQL	MRL	Flags
Aldrin	ND	0.00192	0.00096	
alpha-BHC	ND	0.00192	0.00096	
beta-BHC	ND	0.00384	0.00192	
delta-BHC	ND	0.00192	0.00096	
gamma-BHC (Lindane)	ND	0.00192	0.00096	
4,4'-DDD	ND	0.00384	0.00192	
4,4'-DDE	ND	0.00384	0.00192	
4,4'-DDT	ND	0.00384	0.00192	
Dieldrin	ND	0.00384	0.00192	
Endosulfan I	ND	0.00192	0.00096	
Endosulfan II	ND	0.00384	0.00192	
Endosulfan sulfate	ND	0.00384	0.00192	
Endrin	ND	0.00384	0.00192	
Endrin aldehyde	ND	0.00384	0.00192	
Heptachlor	ND	0.00192	0.00096	
Heptachlor epoxide	ND	0.00192	0.00096	
Methoxychlor	ND	0.0192	0.0096	
Endrin ketone	ND	0.00384	0.00192	
Toxaphene	ND	0.192	0.096	
alpha-Chlordane	ND	0.00192	0.00096	
gamma-Chlordane	ND	0.00192	0.00096	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030809
Lab ID:	115555-01
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	26.73
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	53.1	X9	57	153
Decachlorobiphenyl	56.4	X9	57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND	3.53	1.76	
alpha-BHC	ND	3.53	1.76	
beta-BHC	ND	3.53	1.76	
delta-BHC	ND	3.53	1.76	
gamma-BHC (Lindane)	ND	3.53	1.76	
4,4'-DDD	ND	7.06	3.53	
4,4'-DDE	ND	7.06	3.53	
4,4'-DDT	ND	7.06	3.53	
Dieldrin	ND	7.06	3.53	
Endosulfan I	ND	3.53	1.76	
Endosulfan II	ND	7.06	3.53	
Endosulfan sulfate	ND	7.06	3.53	
Endrin	ND	7.06	3.53	
Endrin aldehyde	ND	7.06	3.53	
Heptachlor	ND	3.53	1.76	
Heptachlor epoxide	ND	3.53	1.76	
Methoxychlor	ND	35.3	17.6	
Endrin ketone	ND	7.06	3.53	
Toxaphene	ND	353	176	
alpha-Chlordane	ND	3.53	1.76	
gamma-Chlordane	ND	3.53	1.76	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030810
Lab ID:	115555-02
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	36.41
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	58.2		57	153
Decachlorobiphenyl	45.6	X9	57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		2.6	1.3	
alpha-BHC	ND		2.6	1.3	
beta-BHC	ND		2.6	1.3	
delta-BHC	ND		2.6	1.3	
gamma-BHC (Lindane)	ND		2.6	1.3	
4,4'-DDD	ND		5.2	2.6	
4,4'-DDE	ND		5.2	2.6	
4,4'-DDT	ND		5.2	2.6	
Dieldrin	ND		5.2	2.6	
Endosulfan I	ND		2.6	1.3	
Endosulfan II	ND		5.2	2.6	
Endosulfan sulfate	ND		5.2	2.6	
Endrin	ND		5.2	2.6	
Endrin aldehyde	ND		5.2	2.6	
Heptachlor	ND		2.6	1.3	
Heptachlor epoxide	ND		2.6	1.3	
Methoxychlor	ND		26	13	
Endrin ketone	ND		5.2	2.6	
Toxaphene	ND		260	130	
alpha-Chlordane	ND		2.6	1.3	
gamma-Chlordane	ND		2.6	1.3	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030811
Lab ID:	115555-03
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	73.74
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

Surrogate	% Recovery	Flags	Recovery Limits Low	High
Tetrachloro-m-xylene	82.5		57	153
Decachlorobiphenyl	89.7		57	145

Sample results are on a dry weight basis.

Analyte		Result (ug/kg)	PQL	MRL	Flags
Aldrin		8.13	1.28	1.28	C2,N
alpha-BHC	ND		1.28	1.28	
beta-BHC		7.16	1.28	1.28	C2,N
delta-BHC	ND		1.28	1.28	
gamma-BHC (Lindane)	ND		1.28	1.28	
4,4'-DDD	ND		2.56	2.56	
4,4'-DDE		7.56	2.56	2.56	C1,N
4,4'-DDT	ND		2.56	2.56	
Dieldrin	ND		2.56	2.56	
Endosulfan I	ND		1.28	1.28	
Endosulfan II		15.7	2.56	2.56	C2,N
Endosulfan sulfate	ND		2.56	2.56	
Endrin		16.9	2.56	2.56	C2,N
Endrin aldehyde		17.3	2.56	2.56	C2,N
Heptachlor		1.66	1.28	1.28	C1,N
Heptachlor epoxide	ND		1.28	1.28	
Methoxychlor	ND		12.8	12.8	
Endrin ketone	ND		2.56	2.56	
Toxaphene	ND		128	128	
alpha-Chlordane	ND		1.28	1.28	
gamma-Chlordane	ND		1.28	1.28	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030812
Lab ID:	115555-04
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	25.6
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	82.2		57	153
Decachlorobiphenyl	65.6		57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		3.84	1.92	
alpha-BHC	ND		3.84	1.92	
beta-BHC	ND		3.84	1.92	
delta-BHC	ND		3.84	1.92	
gamma-BHC (Lindane)	ND		3.84	1.92	
4,4'-DDD	ND		7.67	3.84	
4,4'-DDE	ND		7.67	3.84	
4,4'-DDT	ND		7.67	3.84	
Dieldrin	ND		7.67	3.84	
Endosulfan I	ND		3.84	1.92	
Endosulfan II	ND		7.67	3.84	
Endosulfan sulfate	ND		7.67	3.84	
Endrin	ND		7.67	3.84	
Endrin aldehyde	ND		7.67	3.84	
Heptachlor	ND		3.84	1.92	
Heptachlor epoxide	ND		3.84	1.92	
Methoxychlor	ND		38.4	19.2	
Endrin ketone	ND		7.67	3.84	
Toxaphene	ND		384	192	
alpha-Chlordane	ND		3.84	1.92	
gamma-Chlordane	ND		3.84	1.92	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030813
Lab ID:	115555-05
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	84.79
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	79.7		57	153
Decachlorobiphenyl	70.3		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND	1.15	1.15	
alpha-BHC	ND	1.15	1.15	
beta-BHC	ND	1.15	1.15	
delta-BHC	ND	1.15	1.15	
gamma-BHC (Lindane)	ND	1.15	1.15	
4,4'-DDD	ND	2.3	2.3	
4,4'-DDE	ND	2.3	2.3	
4,4'-DDT	ND	2.3	2.3	
Dieldrin	ND	2.3	2.3	
Endosulfan I	ND	1.15	1.15	
Endosulfan II	ND	2.3	2.3	
Endosulfan sulfate	ND	2.3	2.3	
Endrin	ND	2.3	2.3	
Endrin aldehyde	ND	2.3	2.3	
Heptachlor	ND	1.15	1.15	
Heptachlor epoxide	ND	1.15	1.15	
Methoxychlor	ND	11.5	11.5	
Endrin ketone	ND	2.3	2.3	
Toxaphene	ND	115	115	
alpha-Chlordane	ND	1.15	1.15	
gamma-Chlordane	ND	1.15	1.15	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030814
Lab ID:	115555-06
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	52.92
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	77.5		57	153
Decachlorobiphenyl	58.7		57	145

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND		1.89	0.943	
alpha-BHC	ND		1.89	0.943	
beta-BHC	ND		1.89	0.943	
delta-BHC	ND		1.89	0.943	
gamma-BHC (Lindane)	ND		1.89	0.943	
4,4'-DDD	ND		3.77	1.89	
4,4'-DDE	ND		3.77	1.89	
4,4'-DDT	ND		3.77	1.89	
Dieldrin	ND		3.77	1.89	
Endosulfan I	ND		1.89	0.943	
Endosulfan II	ND		3.77	1.89	
Endosulfan sulfate	ND		3.77	1.89	
Endrin	ND		3.77	1.89	
Endrin aldehyde	ND		3.77	1.89	
Heptachlor	ND		1.89	0.943	
Heptachlor epoxide	ND		1.89	0.943	
Methoxychlor	ND		18.9	9.43	
Endrin ketone	ND		3.77	1.89	
Toxaphene	ND		189	94.3	
alpha-Chlordane	ND		1.89	0.943	
gamma-Chlordane	ND		1.89	0.943	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030815
Lab ID:	115555-07
Date Received:	8/19/2003
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	76.74
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tetrachloro-m-xylene	72.4		57	153
Decachlorobiphenyl	75		57	145

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MRL**	**Flags**
Aldrin	ND	1.27	1.27	
alpha-BHC	ND	1.27	1.27	
beta-BHC	ND	1.27	1.27	
delta-BHC	ND	1.27	1.27	
gamma-BHC (Lindane)	ND	1.27	1.27	
4,4'-DDD	ND	2.54	2.54	
4,4'-DDE	ND	2.54	2.54	
4,4'-DDT	ND	2.54	2.54	
Dieldrin	ND	2.54	2.54	
Endosulfan I	ND	1.27	1.27	
Endosulfan II	ND	2.54	2.54	
Endosulfan sulfate	ND	2.54	2.54	
Endrin	ND	2.54	2.54	
Endrin aldehyde	ND	2.54	2.54	
Heptachlor	ND	1.27	1.27	
Heptachlor epoxide	ND	1.27	1.27	
Methoxychlor	ND	12.7	12.7	
Endrin ketone	ND	2.54	2.54	
Toxaphene	ND	127	127	
alpha-Chlordane	ND	1.27	1.27	
gamma-Chlordane	ND	1.27	1.27	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030809
Lab ID:	115555-01
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	26.73
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	29700	120	48	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030809 - dup
Lab ID:	115555R01
Date Received:	-
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	26.73
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	29400	133	53.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	
Lab ID:	115555X01
Date Received:	-
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	26.73
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	30300	123	49.2	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030810
Lab ID:	115555-02
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	36.41
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	23200	143	57.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030811
Lab ID:	115555-03
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	73.74
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	21000	113	45.1	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030812
Lab ID:	115555-04
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	25.6
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	31900	126	50.4	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030813
Lab ID:	115555-05
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	84.79
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	10500	114	45.5	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030814
Lab ID:	115555-06
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	52.92
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	31600	149	59.4	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FC 030815
Lab ID:	115555-07
Date Received:	8/19/03
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	76.74
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	MDL	Flags
TOC	32100	117	46.9	

STL Seattle

Client Name	North Creek Analytical
Client ID:	FO 030816
Lab ID:	115555-08
Date Received:	8/19/03
Date Prepared:	8/29/03
Date Analyzed:	8/29/03
% Solids	-
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Analyte	Result (mg/L)	PQL	MDL	Flags
TOC	0.624	0.5	0.35	

STL Seattle

Lab ID:	Method Blank - GB3540
Date Received:	-
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	
Dilution Factor	1

Volatile Petroleum Products by WSDOE Method NWTPH-Gx Modified

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Trifluorotoluene	76.7		50	150
Bromofluorobenzene	88.3		50	150
Pentafluorobenzene	68.8		50	150

Sample results are on an as received basis.

Analyte	**Result (mg/kg)**	**PQL**	**Flags**
Gasoline by NWTPH-G	ND	4	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	GB3540
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
QC Batch ID:	GB3540

Volatile Petroleum Products by WSDOE Method NWTPH-Gx Modified

Compound Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	BSD Result (mg/kg)	BSD % Rec.	RPD	Flag
Gasoline by NWTPH-G	0	50	44.9	89.9	44.4	88.9	-1.1	

STL Seattle

Lab ID:	Method Blank - DW0478
Date Received:	-
Date Prepared:	8/19/2003
Date Analyzed:	8/21/2003
% Solids	-
Dilution Factor	1

Diesel and Motor Oil by NWTPH-Dx Modified

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
o-terphenyl	129		50	150

Analyte	Result (mg/L)	PQL	MRL	Flags
#2 Diesel	ND	0.25	0.125	
Motor Oil	ND	0.5	0.25	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	DW0478
Date Prepared:	8/19/2003
Date Analyzed:	8/21/2003
QC Batch ID:	DW0478

Diesel and Motor Oil by NWTPH-Dx Modified

Compound Name	Blank Result (mg/L)	Spike Amount (mg/L)	BS Result (mg/L)	BS % Rec.	BSD Result (mg/L)	BSD % Rec.	RPD	Flag
#2 Diesel	0	5	6.42	128	6.47	129	0.78	
Motor Oil	0	5	4.93	98.6	4.88	97.6	-1	

STL Seattle

Lab ID:	Method Blank - SS0909
Date Received:	-
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
% Solids	
Dilution Factor	1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	High
2 - Fluorophenol	106		35	144
Phenol - d5	116		39	140
Nitrobenzene - d5	94.5		37	156
2 - Fluorobiphenyl	93.4		39	145
2,4,6 - Tribromophenol	80.5		25	148
p - Terphenyl - d14	104		39	158

Sample results are on an as received basis.

Analyte	Result (ug/kg)	PQL	MRL	Flags
Phenol	ND	267	133	
bis(2-Chloroethyl)ether	ND	267	133	
2-Chlorophenol	ND	267	133	
1,3-Dichlorobenzene	ND	267	133	
1,4-Dichlorobenzene	ND	267	133	
Benzyl Alcohol	ND	333	167	
1,2-Dichlorobenzene	ND	267	133	
2-Methylphenol	ND	267	133	
bis(2-Chloroisopropyl)ether	ND	267	133	
3-&4-Methylphenol	ND	533	267	
N-nitroso-di-n-propylamine	ND	267	133	
Hexachloroethane	ND	267	133	
Nitrobenzene	ND	267	133	
Isophorone	ND	267	133	
2-Nitrophenol	ND	267	133	
2,4-Dimethylphenol	ND	267	133	
Benzoic Acid	ND	1330	667	
bis(2-Chloroethoxy)methane	ND	267	133	
2,4-Dichlorophenol	ND	267	133	
1,2,4-Trichlorobenzene	ND	267	133	
Naphthalene	ND	66.7	33.3	
4-Chloroaniline	ND	267	133	
Hexachlorobutadiene	ND	267	133	
4-Chloro-3-methylphenol	ND	267	133	
2-Methylnaphthalene	ND	66.7	33.3	
Hexachlorocyclopentadiene	ND	267	133	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for SS0909 continued...

Analyte		Result (ug/kg)	PQL	MRL
2,4,6-Trichlorophenol	ND		267	133
2,4,5-Trichlorophenol	ND		267	133
2-Chloronaphthalene	ND		66.7	33.3
2-Nitroaniline	ND		267	133
Dimethylphthalate	ND		267	133
Acenaphthylene	ND		66.7	33.3
2,6-Dinitrotoluene	ND		267	133
3-Nitroaniline	ND		267	133
Acenaphthene	ND		66.7	33.3
2,4-Dinitrophenol	ND		1330	667
4-Nitrophenol	ND		667	333
Dibenzofuran	ND		267	133
2,4-Dinitrotoluene	ND		267	133
Diethylphthalate	ND		267	133
4-Chlorophenylphenylether	ND		267	133
Fluorene	ND		66.7	33.3
4-Nitroaniline	ND		267	133
4,6-Dinitro-2-methylphenol	ND		1330	667
N-Nitrosodiphenylamine	ND		267	133
4-Bromophenylphenylether	ND		267	133
Hexachlorobenzene	ND		267	133
Pentachlorophenol	ND		267	133
Phenanthrene	ND		66.7	33.3
Anthracene	ND		66.7	33.3
Di-n-butylphthalate	ND		267	133
Fluoranthene	ND		66.7	33.3
Pyrene	ND		66.7	33.3
Butylbenzylphthalate	ND		333	167
3,3'-Dichlorobenzidine	ND		533	267
Benzo(a)anthracene	ND		66.7	33.3
Chrysene	ND		66.7	33.3
bis(2-Ethylhexyl)phthalate	ND		267	133
Di-n-octylphthalate	ND		267	133
Benzofluoranthenes	ND		66.7	33.3
Benzo(a)pyrene	ND		66.7	33.3
Indeno(1,2,3-cd)pyrene	ND		66.7	33.3
Dibenz(a,h)anthracene	ND		66.7	33.3
Benzo(g,h,i)perylene	ND		66.7	33.3

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	SS0909
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
QC Batch ID:	SS0909

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	1000	994	99.4	1140	114	14	
2-Chlorophenol	0	1000	998	99.8	1100	110	9.7	
1,4-Dichlorobenzene	0	667	733	110	841	126	14	
N-nitroso-di-n-propylamine	0	667	797	119	712	107	-11	
1,2,4-Trichlorobenzene	0	667	849	127	828	124	-2.4	
4-Chloro-3-methylphenol	0	1000	1090	109	1200	120	9.6	
Acenaphthene	0	667	793	119	888	133	11	
4-Nitrophenol	0	1000	1360	136	1380	138	1.5	
2,4-Dinitrotoluene	0	667	585	87.8	635	95.2	8.1	
Pentachlorophenol	0	1000	551	55.1	610	61	10	
Pyrene	0	667	739	111	807	121	8.6	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 030809
Lab ID:	115555-01
Date Prepared:	8/20/2003
Date Analyzed:	8/20/2003
QC Batch ID:	SS0909

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	3660	3500	95.5	3370	94.8	-0.74	
2-Chlorophenol	0	3660	3700	101	3300	92.7	-8.6	
1,4-Dichlorobenzene	0	2440	2680	110	2550	108	-1.8	
N-nitroso-di-n-propylamine	0	2440	1080	44.2	1040	43.7	-1.1	
1,2,4-Trichlorobenzene	0	2440	2530	104	2600	110	5.6	
4-Chloro-3-methylphenol	0	3660	4220	115	3920	110	-4.4	
Acenaphthene	0	2440	3020	123	2840	120	-2.5	
4-Nitrophenol	0	3660	5690	155	5060	142	-8.8	X7
2,4-Dinitrotoluene	0	2440	2150	88	2000	84.2	-4.4	
Pentachlorophenol	0	3660	2550	69.7	2530	71.1	2	
Pyrene	63	2440	3050	122	2800	107	-13	

STL Seattle

Lab ID:	Method Blank - SW0690
Date Received:	-
Date Prepared:	8/19/2003
Date Analyzed:	8/20/2003
% Solids	-
Dilution Factor	0.1

Semivolatile Organics by USEPA Method 8270

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
2 - Fluorophenol	67.1		10	112
Phenol - d5	51.8		10	85
Nitrobenzene - d5	109		41	155
2 - Fluorobiphenyl	84.8		34	148
2,4,6 - Tribromophenol	95.5		29	159
p - Terphenyl - d14	105		33	172

Analyte	Result (ug/L)	PQL	MRL	Flags
Phenol	ND	0.2	0.1	
bis(2-Chloroethyl)ether	ND	0.2	0.1	
2-Chlorophenol	ND	0.2	0.1	
1,3-Dichlorobenzene	ND	0.2	0.1	
1,4-Dichlorobenzene	ND	0.2	0.1	
Benzyl Alcohol	ND	0.2	0.1	
1,2-Dichlorobenzene	ND	0.2	0.1	
2-Methylphenol	ND	0.2	0.1	
bis(2-Chloroisopropyl)ether	ND	0.2	0.1	
3-&4-Methylphenol	ND	0.4	0.2	
N-nitroso-di-n-propylamine	ND	0.2	0.1	
Hexachloroethane	ND	0.2	0.1	
Nitrobenzene	ND	0.2	0.1	
Isophorone	ND	0.2	0.1	
2-Nitrophenol	ND	0.2	0.1	
2,4-Dimethylphenol	ND	1	0.5	
Benzoic Acid	ND	1	0.5	
bis(2-Chloroethoxy)methane	ND	0.2	0.1	
2,4-Dichlorophenol	ND	0.2	0.1	
1,2,4-Trichlorobenzene	ND	0.2	0.1	
Naphthalene	ND	0.06	0.03	
4-Chloroaniline	ND	0.3	0.15	
Hexachlorobutadiene	ND	0.2	0.1	
4-Chloro-3-methylphenol	ND	0.2	0.1	
2-Methylnaphthalene	ND	0.05	0.025	
Hexachlorocyclopentadiene	ND	1	0.5	

STL Seattle

Semivolatile Organics by USEPA Method 8270 data for SW0690 continued...

Analyte	Result (ug/L)	PQL	MRL	
2,4,6-Trichlorophenol	ND	0.2	0.1	
2,4,5-Trichlorophenol	ND	0.2	0.1	
2-Chloronaphthalene	ND	0.05	0.025	
2-Nitroaniline	ND	0.2	0.1	
Dimethylphthalate	ND	0.2	0.1	
Acenaphthylene	ND	0.05	0.025	
2,6-Dinitrotoluene	ND	0.2	0.1	
3-Nitroaniline	ND	0.2	0.1	
Acenaphthene	ND	0.05	0.025	
2,4-Dinitrophenol	ND	1	0.5	
4-Nitrophenol	ND	1	0.5	
Dibenzofuran	ND	0.2	0.1	
2,4-Dinitrotoluene	ND	0.2	0.1	
Diethylphthalate	ND	0.2	0.1	
4-Chlorophenylphenylether	ND	0.2	0.1	
Fluorene	ND	0.05	0.025	
4-Nitroaniline	ND	0.2	0.1	
4,6-Dinitro-2-methylphenol	ND	1	0.5	
N-Nitrosodiphenylamine	ND	0.2	0.1	
4-Bromophenylphenylether	ND	0.2	0.1	
Hexachlorobenzene	ND	0.2	0.1	
Pentachlorophenol	ND	0.65	0.325	
Phenanthrene	ND	0.05	0.025	
Anthracene	ND	0.05	0.025	
Di-n-butylphthalate	0.112	0.2	0.1	J
Fluoranthene	ND	0.05	0.025	
Pyrene	ND	0.05	0.025	
Butylbenzylphthalate	ND	0.3	0.15	
3,3'-Dichlorobenzidine	ND	1	0.5	
Benzo(a)anthracene	ND	0.05	0.025	
Chrysene	ND	0.05	0.025	
bis(2-Ethylhexyl)phthalate	ND	1.5	0.75	
Di-n-octylphthalate	ND	0.2	0.1	
Benzofluoranthenes	ND	0.1	0.05	
Benzo(a)pyrene	ND	0.05	0.025	
Indeno(1,2,3-cd)pyrene	ND	0.05	0.025	
Dibenz(a,h)anthracene	ND	0.05	0.025	
Benzo(g,h,i)perylene	ND	0.05	0.025	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	SW0690
Date Prepared:	8/19/2003
Date Analyzed:	8/20/2003
QC Batch ID:	SW0690

Semivolatile Organics by USEPA Method 8270

Compound Name	Blank Result (ug/L)	Spike Amount (ug/L)	BS Result (ug/L)	BS % Rec.	BSD Result (ug/L)	BSD % Rec.	RPD	Flag
Phenol	0	1.5	0.605	40.4	0.609	40.6	0.49	
2-Chlorophenol	0	1.5	1.07	71.1	1.06	70.8	-0.42	
1,4-Dichlorobenzene	0	1	0.815	81.5	0.793	79.3	-2.7	
N-nitroso-di-n-propylamine	0	1	0.924	92.4	0.789	78.9	-16	
1,2,4-Trichlorobenzene	0	1	0.795	79.5	0.818	81.8	2.9	
4-Chloro-3-methylphenol	0	1.5	1.27	85	1.11	73.9	-14	
Acenaphthene	0	1	1.02	102	0.918	91.8	-11	
4-Nitrophenol	0	1.5	1.05	70.3	0.927	61.8	-13	
2,4-Dinitrotoluene	0	1	0.816	81.6	0.748	74.8	-8.7	
Pentachlorophenol	0	1.5	0.909	60.6	0.928	61.9	2.1	
Pyrene	0	1	0.986	98.6	0.939	93.9	-4.9	

STL Seattle

Lab ID:	Method Blank - PB0571
Date Received:	-
Date Prepared:	8/20/03
Date Analyzed:	8/20/03
% Solids	
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	88.8		72	114
Decachlorobiphenyl	95		55	133

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	MRL	Flags
Aroclor 1016	ND	0.01	0.005	
Aroclor 1221	ND	0.02	0.01	
Aroclor 1232	ND	0.01	0.005	
Aroclor 1242	ND	0.01	0.005	
Aroclor 1248	ND	0.01	0.005	
Aroclor 1254	ND	0.01	0.005	
Aroclor 1260	ND	0.01	0.005	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PB0571
Date Prepared:	8/20/03
Date Analyzed:	8/20/03
QC Batch ID:	PB0571

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	0.1	0.1	100	0.0968	96.8	-3.3	
Aroclor 1260	0	0.1	0.095	95	0.0925	92.5	-2.7	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	GHUS-B
Lab ID:	115563-04
Date Prepared:	8/20/03
Date Analyzed:	8/20/03
QC Batch ID:	PB0571

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	0.105	0.0789	75.5	0.0788	74	-2	
Aroclor 1260	0	0.105	0.0939	89.8	0.0968	90.9	1.2	

STL Seattle

Lab ID:	Method Blank - PW0196
Date Received:	-
Date Prepared:	8/19/03
Date Analyzed:	8/20/03
% Solids	-
Dilution Factor	1

PCBs by USEPA Method 8082

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	84.8		42	108
Decachlorobiphenyl	94.9		45	136

Analyte	Result (ug/L)	PQL	MRL	Flags
Aroclor 1016	ND	0.02	0.01	
Aroclor 1221	ND	0.04	0.02	
Aroclor 1232	ND	0.02	0.01	
Aroclor 1242	ND	0.02	0.01	
Aroclor 1248	ND	0.02	0.01	
Aroclor 1254	ND	0.02	0.01	
Aroclor 1260	ND	0.02	0.01	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PW0196
Date Prepared:	8/19/03
Date Analyzed:	8/20/03
QC Batch ID:	PW0196

PCBs by USEPA Method 8082

Compound Name	Blank Result (ug/L)	Spike Amount (ug/L)	BS Result (ug/L)	BS % Rec.	BSD Result (ug/L)	BSD % Rec.	RPD	Flag
Aroclor 1242	0	0.1	0.0901	90.1	0.0956	95.6	5.9	
Aroclor 1260	0	0.1	0.0928	92.8	0.102	102	9.4	

STL Seattle

Lab ID:	Method Blank - PW0196
Date Received:	-
Date Prepared:	8/19/2003
Date Analyzed:	8/22/2003
% Solids	-
Dilution Factor	1

Organochlorine Pesticides by USEPA Method 8081A

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	102		52	130
Decachlorobiphenyl	111		54	146

Analyte	Result (ug/L)	PQL	MRL	Flags
Aldrin	ND	0.002	0.001	
alpha-BHC	ND	0.002	0.001	
beta-BHC	ND	0.004	0.002	
delta-BHC	ND	0.002	0.001	
gamma-BHC (Lindane)	ND	0.002	0.001	
4,4'-DDD	ND	0.004	0.002	
4,4'-DDE	ND	0.004	0.002	
4,4'-DDT	ND	0.004	0.002	
Dieldrin	ND	0.004	0.002	
Endosulfan I	ND	0.002	0.001	
Endosulfan II	ND	0.004	0.002	
Endosulfan sulfate	ND	0.004	0.002	
Endrin	ND	0.004	0.002	
Endrin aldehyde	ND	0.004	0.002	
Heptachlor	ND	0.002	0.001	
Heptachlor epoxide	ND	0.002	0.001	
Methoxychlor	ND	0.02	0.01	
Endrin ketone	ND	0.004	0.002	
Toxaphene	ND	0.2	0.1	
alpha-Chlordane	ND	0.002	0.001	
gamma-Chlordane	ND	0.002	0.001	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PW0196
Date Prepared:	8/19/2003
Date Analyzed:	8/22/2003
QC Batch ID:	PW0196

Organochlorine Pesticides by USEPA Method 8081A

Compound Name	Blank Result (ug/L)	Spike Amount (ug/L)	BS Result (ug/L)	BS % Rec.	BSD Result (ug/L)	BSD % Rec.	RPD	Flag
Aldrin	0	0.02	0.0177	88.3	0.0201	100	12	
gamma-BHC (Lindane)	0	0.02	0.0186	93	0.0209	104	11	
4,4'-DDT	0	0.02	0.0207	104	0.0228	114	9.2	
Dieldrin	0	0.02	0.0215	107	0.0238	119	11	
Endrin	0	0.02	0.0191	95.6	0.0202	101	5.5	
Heptachlor	0	0.02	0.0199	99.5	0.0224	112	12	

STL Seattle

Lab ID:	Method Blank - PE1620
Date Received:	-
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	110		57	153
Decachlorobiphenyl	112		57	145

Sample results are on an as received basis.

Analyte	Result (ug/kg)	PQL	MRL	Flags
Aldrin	ND	1	0.5	
alpha-BHC	ND	1	0.5	
beta-BHC	ND	1	0.5	
delta-BHC	ND	1	0.5	
gamma-BHC (Lindane)	ND	1	0.5	
4,4'-DDD	ND	2	1	
4,4'-DDE	ND	2	1	
4,4'-DDT	ND	2	1	
Dieldrin	ND	2	1	
Endosulfan I	ND	1	0.5	
Endosulfan II	ND	2	1	
Endosulfan sulfate	ND	2	1	
Endrin	ND	2	1	
Endrin aldehyde	ND	2	1	
Heptachlor	ND	1	0.5	
Heptachlor epoxide	ND	1	0.5	
Methoxychlor	ND	10	5	
Endrin ketone	ND	2	1	
alpha-Chlordane	ND	1	0.5	
gamma-Chlordane	ND	1	0.5	

STL Seattle

Lab ID:	Method Blank - PE1620S8
Date Received:	-
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
% Solids	
Dilution Factor	1

Organochlorine Pesticides by USEPA Methods 8081B

Surrogate	% Recovery	Flags	Recovery Limits Low	Recovery Limits High
Tetrachloro-m-xylene	84.9		57	153
Decachlorobiphenyl	86.1		57	145

Sample results are on an as received basis.

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

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PE1620
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
QC Batch ID:	PE1620

Organochlorine Pesticides by USEPA Methods 8081B

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	20	20.6	103	18.9	94.7	-8.4	
alpha-BHC	0	20	21.1	105	19.6	97.9	-7	
beta-BHC	0	20	20.6	103	19.1	95.5	-7.6	
delta-BHC	0	20	18.6	93	17.8	88.8	-4.6	
gamma-BHC (Lindane)	0	20	21.3	107	19.9	99.7	-7.1	
4,4'-DDD	0	40	45	113	42	105	-7.3	
4,4'-DDE	0	40	42.6	106	39.5	98.7	-7.1	
4,4'-DDT	0	40	45.1	113	41.6	104	-8.3	
Dieldrin	0	40	43.7	109	40.8	102	-6.6	
Endosulfan I	0	20	21.3	107	19.8	99.2	-7.6	
Endosulfan II	0	40	37.2	93.1	35.8	89.5	-3.9	
Endosulfan sulfate	0	20	18.4	92.1	20.8	104	12	
Endrin	0	40	42.1	105	39.2	98.1	-6.8	
Endrin aldehyde	0	40	23.3	58.1	24.6	61.6	5.8	
Heptachlor	0	20	21.4	107	19.7	98.6	-8.2	
Heptachlor epoxide	0	20	20.5	103	19	95.2	-7.9	
Methoxychlor	0	200	203	101	195	97.5	-3.5	
Endrin ketone	0	40	26.3	65.8	27.7	69.3	5.2	
alpha-Chlordane	0	20	21.6	108	20	99.8	-7.9	
gamma-Chlordane	0	20	21.6	108	20.2	101	-6.7	

STL Seattle

Blank Spike/Blank Spike Duplicate Report

Lab ID:	PE1620S8
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
QC Batch ID:	PE1620S8

Organochlorine Pesticides by USEPA Methods 8081B

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	20	15.9	79.3	12.1	60.5	-27	
alpha-BHC	0	20	8.61	43	7.47	37.4	-14	N
beta-BHC	0	20	3.36	16.8	3.49	17.5	4.1	N
delta-BHC	0	20	0	0	1.74	8.68	200	N
gamma-BHC (Lindane)	0	20	4.88	24.4	5.54	27.7	13	N
4,4'-DDD	0	40	16.5	41.3	14.4	36.1	-13	
4,4'-DDE	0	40	33.5	83.7	24.3	60.9	-32	
4,4'-DDT	0	40	23.1	57.8	19.4	48.4	-18	N
Dieldrin	0	40	19.5	48.6	17.9	44.8	-8.1	N
Endosulfan I	0	20	12.9	64.5	10.7	53.4	-19	
Endosulfan II	0	40	0	0	4.54	11.4	200	N
Endosulfan sulfate	0	20	0	0	0	0	0	N
Endrin	0	40	22.8	57.1	19.3	48.3	-17	N
Endrin aldehyde	0	40	2.57	6.43	0	0	-200	N
Heptachlor	0	20	15.8	79	12.1	60.5	-27	N
Heptachlor epoxide	0	20	10.5	52.5	8.66	43.3	-19	N
Methoxychlor	0	200	27.6	13.8	31	15.5	12	N
Endrin ketone	0	40	1.47	3.67	1.5	3.75	2.2	N
alpha-Chlordane	0	20	11.8	58.9	9.82	49.1	-18	N
gamma-Chlordane	0	20	11.5	57.3	9.96	49.8	-14	N

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	FO 030809
Lab ID:	115555-01
Date Prepared:	8/22/2003
Date Analyzed:	8/27/2003
QC Batch ID:	PE1620

Organochlorine Pesticides by USEPA Methods 8081B

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	71.6	74.5	104	79.9	107	2.8	
alpha-BHC	0	71.6	75	105	81.5	109	3.7	
beta-BHC	0	71.6	68.7	96	78.9	106	9.9	
delta-BHC	0	71.6	52.1	72.7	66.7	89.3	20	
gamma-BHC (Lindane)	0	71.6	73.3	102	82.8	111	8.5	
4,4'-DDD	0	143	159	111	173	116	4.4	
4,4'-DDE	0	143	154	107	165	110	2.8	
4,4'-DDT	0	143	162	113	175	117	3.5	
Dieldrin	0	143	155	108	169	113	4.5	
Endosulfan I	0	71.6	76.5	107	82.4	110	2.8	
Endosulfan II	0	143	89.8	62.7	122	81.6	26	
Endosulfan sulfate	0	143	16.9	11.8	34.1	22.8	64	X7
Endrin	0	143	152	106	166	111	4.6	
Endrin aldehyde	0	143	31	21.6	45.9	30.7	35	X7
Heptachlor	0	71.6	77.8	109	83.3	112	2.7	
Heptachlor epoxide	0	71.6	73.1	102	79.6	107	4.8	
Methoxychlor	0	716	668	93.3	796	106	13	
Endrin ketone	0	143	33.5	23.4	56.6	37.9	47	X7
alpha-Chlordane	0	71.6	77.5	108	84	112	3.6	
gamma-Chlordane	0	71.6	76.5	107	82.9	111	3.7	

STL Seattle

Lab ID:	Method Blank - TOC1062
Date Received:	-
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
% Solids	
Dilution Factor	1

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Sample results are on an as received basis.

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

STL Seattle

Triplicate Report

Client Sample ID:	FO 030809
Lab ID:	115555-01
Date Prepared:	8/28/03
Date Analyzed:	8/28/03
QC Batch ID:	TOC1062

Total Organic Carbon by Puget Sound Estuary Protocol (PSEP)

Parameter Name	Sample Result (mg/kg)	Duplicate Result (mg/kg)	Triplicate Result (mg/kg)	RSD %	Flag
TOC	29700	29400	30300	1.5	

STL Seattle

Lab ID:	Method Blank - TOC1063
Date Received:	-
Date Prepared:	8/29/03
Date Analyzed:	8/29/03
% Solids	-
Dilution Factor	1

Total Organic Carbon by USEPA Method 9060

Analyte	Result (mg/L)	PQL	MDL	Flags
TOC	ND	0.5	0.35	

STL Seattle

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:	MW-3
Lab ID:	115676-01
Date Prepared:	8/29/03
Date Analyzed:	8/29/03
QC Batch ID:	TOC1063

Total Organic Carbon by USEPA Method 9060

Compound Name	Sample Result (mg/L)	Spike Amount (mg/L)	MS Result (mg/L)	MS % Rec.	MSD Result (mg/L)	MSD % Rec.	RPD	Flag
TOC	540	1000	1500	96.6	1490	95.2	-1.5	

APPENDIX F
Data Validation Report

Review of Quality Assurance/Quality Control (QA/QC) Data for Portland Harbor Inline Solids Sampling, Basins M-1 and 18, August 2003

TO: Dave Livesay/CH2M HILL/CVO
David Lacey/CH2M HILL/PDX

COPIES: Project File

FROM: Wendi Gale/CH2M HILL/CVO

DATE: September 29, 2003

Summary

The majority of the data have met the QA/QC acceptance criteria outlined for the Portland Harbor Inline Solids 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, diesel/lube oil range hydrocarbons (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:

- Positive SVOC-SIM results for seven sediment samples were qualified as estimates and flagged with a "J" as a result of surrogate recoveries reported above the upper QC acceptance criteria.

The majority of gasoline range hydrocarbons (NWTPH-Gx) 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:

- Positive NWTPH-Gx results for two sediment samples were qualified as estimates and flagged with a "J" as a result of surrogate recoveries reported above the upper QC acceptance criteria.

The majority of hydrocarbon (NWTPH-HCID) 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:

- NWTPH-HCID results for two sediment samples were qualified as estimates and flagged with a "J" for positive results or with a "UJ" for nondetected results as a result of surrogate recoveries not reported due to matrix interference.

Introduction

Twelve sediment samples, one field duplicate, and one rinsate blank samples were collected between August 12 and 20, 2003. Samples submitted for metals, mercury, and NWTPH-HCID analyses were performed by City of Portland Water Pollution Control Laboratory (CITY), located in Portland, Oregon. Samples submitted for SVOC-SIM, pesticides, PCBs, NWTPH-Gx and TOC analyses were performed by Severn Trent Laboratory (STL), located in Tacoma, Washington. Six samples submitted for NWTPH-Dx analysis were performed by CITY, six samples submitted for NWTPH-Dx were performed by STL.

Data Review Criteria

EPA Contract Laboratory Program (CLP) *National Functional Guidelines (NFG) for Organic Data Review* (February 1994) and *National Functional Guidelines (NFG) for Inorganic Data Review* (February 1994) provided guidelines for data qualification, where applicable.

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)
- Field QA/QC (rinsate blanks and field duplicates)

Only summary QA/QC information were reviewed for each analytical parameter. Analytical results and QA/QC summary information were provided for all sample analyses.

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.
- U.S. EPA. Methods for Chemical Analysis of Water and Wastes. 600/4-79-200, March, 1983.
- U.S. EPA. Methods for the Determination of Organic Compounds in Drinking Water. 600/4-88-039, December, 1988. Revised July, 1991.
- Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992.

- Puget Sound Water Quality Action Team. Recommended Guidelines for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Sampling Chapter. April, 1997.
- Oregon D.E.Q. NWTPH Methods (NWTPH-HCID, NWTPH-Gx, and NWTPH-Dx) are 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	No. of Field Duplicates	No. of Rinsate Blanks
SVOC-SIM	EPA 8270C-SIM	12 sediment	1 sediment	1 water
Pesticides	SW 8081	12 sediment	1 sediment	1 water
PCBs	SW 8082	12 sediment	1 sediment	1 water
Hydrocarbon	NWTPH-HCID	6 sediment	1 sediment	1 water
NWTPH-Gasoline Range Hydrocarbons	NWTPH-Gx	1 sediment	1 sediment	none
NWTPH-Diesel/Lube Oil Range Hydrocarbons	NWTPH-Dx	12 sediment	1 sediment	1 water
Metals and Mercury	EPA 6020 sediment EPA 200.8 water	12 sediment	1 sediment	1 water
TOC	SW 9060 and PSEP (Puget Sound Estuary Program)	12 sediment	1 sediment	1 water

Qualifiers

The following definitions provide brief explanations of the data qualifiers that were 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.

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 and no bubbles were noted in liquid samples submitted for analysis. All sediment and rinsate blank samples were extracted and/or analyzed within their respective holding time requirements.

The case narrative for CITY lab SDG AH069 describes chromatographic evaluations of PEST results. Due to matrix interference, PEST results should be considered estimates for samples IL-18-AAT557-0803, IL-18-AAT463-0803, and IL-18-AAT537-0803. Chromatograms were not provided by the laboratory, therefore matrix interference could not be verified and results were not qualified.

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.

Except for the instance noted below, 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.

According to the case narrative for STL SDG 115555, PCBs for samples IL-M1-AAJ831-0803, IL-M1-AAM155-0803, and IL-M1-XXY101-0803 have similar response times as PEST compounds, and should be considered estimates. Response times data were not provided by the lab, therefore response times could not be verified and results were not qualified.

Continuing Calibration

Continuing calibration criteria monitor analytical performance and proper compound identification on a daily or more frequent basis.

Except for the instance noted below, 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.

- The case narrative associated with STL SDG 115693 reported pesticide CCV results for DDT and methoxychlor below the QC acceptance criteria. The samples were diluted and DDT and methoxychlor results were reported from the diluted run. No further qualification was required.

Method Blanks

Method blanks monitor contamination that may be introduced during analysis.

A method blank was analyzed with each analytical batch, therefore meeting frequency QC acceptance criteria. Except for the instances noted below, all method blanks were contamination-free, therefore meeting QC acceptance criteria.

- The SVOC-SIM method blank analyzed on August 20, 2003 (SDG 115555) was reported with detectable concentrations of di-n-butylphthalate (0.112 J µg/L). Rinsate blank results are not qualified based on method blank contamination, therefore no sample results required qualification as a result of the method blank contamination.

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 8270C-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 phenol-d5 was reported above the upper QC control limit for samples IL-M1-AAM155-0803 (155%) and IL-18-AAT558-0803 (174%). Positive SVOC results for samples IL-M1-AAM155-0803 and IL-18-AAT558-0803 were qualified as estimates and flagged with a "J".

- The surrogate recoveries for 2-fluorophenol (210%), nitrobenzene-d5 (298%), and p-terphenol-d14 (363%) were reported above the upper QC control limit as a result of matrix interference for sample IL-18-AAT557-0803. Positive SVOC results for sample IL-18-AAT557-0803 were qualified as estimates and flagged with a "J".

- The surrogate recoveries for 2-fluorophenol (234%), phenol-d5 (214%), nitrobenzene-d5 (181%), and 2,4,6-tribromophenol (247%) were reported above the upper QC control limit as a result of matrix interference for sample IL-18-AAT465-0803. Positive SVOC

results for sample IL-18-AAT465-0803 were qualified as estimates and flagged with a "J".

- The surrogate recoveries for phenol-d5 (227%) and 2,4,6-tribromophenol (154%) were reported above the upper QC control for sample IL-18-AAT463-0803. Positive SVOC results for sample IL-18-AAT463-0803 were qualified as estimates and flagged with a "J".

- The surrogate recoveries for 2-fluorophenol (202%), phenol-d5 (187%), nitrobenzene-d5 (162%), and p-terphenol-d14 (159%) were reported above the upper QC control for sample IL-18-AAT453-0803. Positive SVOC results for sample IL-18-AAT453-0803 were qualified as estimates and flagged with a "J".

- The surrogate recoveries for 2-fluorophenol (183%), phenol-d5 (238%), nitrobenzene-d5 (188%), and 2,4,6-tribromophenol (156%) were reported above the upper QC control for sample IL-18-AAT537-0803. Positive SVOC results for sample IL-18-AAT537-0803 were qualified as estimates and flagged with a "J".

Surrogate recoveries should be within the QC control limits of 41 to 155 percent for nitrobenzene-d5, 34 to 148 percent for 2-fluorobiphenyl, 33 to 172 percent for p-terphenyl-d14, 10 to 85 percent for phenol-d5, 10 to 112 percent for 2-fluorophenol, and 29 to 159 percent for 2,4,6-tribromophenol for water samples. All surrogate recoveries were within the specified QC control limits for water samples.

NWTPH-HCID Method (NWTPH-HCID Hydrocarbons)

Except for the instance noted below, 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.

- The surrogate recovery was not reported as a result of matrix interference in sediment samples IL-M1-AAJ831-0803 and IL-M1-XXY101-0803. NWTPH-HCID results for samples IL-M1-AAJ831-0803 and IL-M1-XXY101-0803 were qualified as estimates and flagged with a "J" for positive results or with a "UJ" for nondetected results.

NWTPH-Gx Method (NWTPH-Gasoline Range Hydrocarbons)

Surrogate recoveries should be within the QC control limits of 50 to 150 percent for trifluorotoluene, bromofluorobenzene, and pentafluorobenzene in sediment samples. Except for the instance noted below, all surrogate recoveries were within the specified QC control limits.

- The surrogate recoveries for bromofluorobenzene were reported above the upper QC control limit for samples IL-M1-AAJ831-0803 (181%) and IL-M1-XXY101-0803 (207%). Positive NWTPH-Gx results for samples IL-M1-AAJ831-0803 and IL-M1-XXY101-0803 were qualified as estimates and flagged with a "J".

NWTPH-Dx Method (NWTPH-Diesel/Lube Oil Range Hydrocarbons)

Surrogate recoveries should be within the QC control limits of 50 to 150 percent for o-terphenyl in sediment samples. All surrogate recoveries reported by STL were within the specified QC control limits.

Surrogate recoveries reported by the CITY lab were met according to the case narrative. Surrogate compounds and 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 dechlorobiphenyl were reported below the lower QC control limit for samples IL-18-AAT463-0803 (56.3%), IL-18-AAT537-0803 (50.5%), and IL-M1-AAM104-0803-SW (45.6%).
- The surrogate recoveries for tetrachloro-m-xylene and dechlorobiphenyl were reported below the lower QC control limit for sample IL-M1-AAM104-0803-NE (53.1% and 56.4%, respectively).

EPA Method SW 8082 (PCBs)

Surrogate recoveries should be within the QC control limits of 72 to 114 percent for tetrachloro-m-xylene and 55 to 133 percent for decachlorobiphenyl in sediment samples. PCB 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 were reported below the lower QC control limit for samples IL-M1-AAJ831-0803 (62.2%) and IL-M1-XXY101-0803 (58.8%).

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. Except for the instance noted below, all acceptance criteria were met according to the case narrative.

- The laboratory duplicate recovery was reported outside the laboratory-established QC control limits for NWTPH-Dx analysis as a result of matrix interference. 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 NWTPH-Dx results were not qualified based on MS/MSD results.

LCS, MS/MSD, and laboratory duplicate data were provided by the STL laboratory. Frequency criteria were met for all analytical methods. Except for the instances 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 and pesticide 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 and pesticide results were not qualified based on MS/MSD results.

Field QA/QC

Rinsate Blanks

Rinsate blanks are used primarily to indicate if contamination has occurred as a result of sample collection or handling procedures.

One rinsate blank sample (RINSATE) was analyzed for SVOC-SIM, pesticides, PCBs, NWTPH-HCID, NWTPH-Gx, NWTPH-Dx, metals, mercury, and TOC.

The rinsate blank sample was reported with detectable concentrations of di-n-butylphthalate (0.108 J µg/L) and TOC (0.624 mg/L). Di-n-butylphthalate and TOC were not detected in any associated samples or were greater than 5 times the detected concentration, therefore sample results were considered unaffected and were not qualified based on equipment blank contamination.

SVOC-SIM were analyzed by STL, and reported by the CITY lab. Di-n-butylphthalate was not reported as a detect in the rinsate blank sample results summary by CITY lab.

Field Duplicates

Field duplicates are another measure of reproducibility by duplicate analysis.

Field duplicate results are used to determine the precision of field sampling and laboratory techniques. There are no criteria or control limits for the %RPD of field duplicates; therefore laboratory duplicate criteria are applied. This allows control limits of ±35 RPD for sediment samples with the provisional control limit of plus or minus the MRL when sample concentrations are less than five times the MRL. These control limits may be too stringent, however, since precision in this case involves both sampling and laboratory precision. There are no specific review criteria used to compare field sample result comparability. Qualifiers are not assigned when field duplicate results do not meet QC acceptance criteria.

Sample IL-M1-AAJ831-0803 was collected in duplicate and analyzed for SVOC, pesticides, PCBs, NWTPH-HCID, NWTPH-Gx, NWTPH-Dx, metals, mercury, and TOC.