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Outfall Basin 18 Inline Solids Investigation

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Technical Memorandum No. OF 18-2
City of Portland Outfall Project
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ENVIRONMENTAL SERVICES
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TECHNICAL MEMORANDUM No. OF18-2

Outfall Basin 18 Inline Solids Investigation

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DATE: July 20, 2010
SUBJECT: Portland Harbor Source Investigation

Introduction

This technical memorandum summarizes the results of the City of Portland source investigations of inline solids in the Outfall Basin 18 stormwater conveyance system between March 2007 and June 2009. In 2007 and 2008, the Lower Willamette Group (LWG) installed inline sediment traps in the Basin 18 conveyance system to evaluate stormwater discharges representative of this mixed use basin, which includes industrial and open space land uses (Anchor and Integral, 2007). Because the LWG sample location represented the majority of the basin, the City installed sediment traps in several subbasins upstream of the LWG sample location between 2007 and 2009 to provide additional information to assist with source tracing activities. The initial City and LWG sediment trap deployment periods were concurrent to allow for a comparison of the two data sets.

Due to limited sediment volume in the traps, the LWG and the initial City samples were not analyzed for all target constituents. The City redeployed traps in Basin 18 during the fall and winter of 2008-09 to address the source investigation data gaps that resulted from the limited sample volumes recovered during the City's 2007 sediment trap deployment.

The objectives of the City's source investigations in Basin 18 were to identify potential source areas for contaminants detected at elevated concentrations in the LWG sediment traps and to conduct a pilot study of different trap designs and bottle shapes to evaluate stormwater solids capture rates. The analytical results indicate that sources of polychlorinated biphenyls (PCBs), pesticides, and metals are present in Basin 18, and that pollutant concentrations were significantly higher in two of the four subbasins sampled by the City. Additionally, polycyclic aromatic hydrocarbons (PAHs) and phthalates are being discharged at low concentrations in one or more of the four areas; however, the relatively low detections do not indicate the presence of

significant sources of these contaminants. The pilot study portion of the investigation was inconclusive in terms of capture rate comparisons, but a new trap design showed promise for use in small-diameter pipe applications (see Attachment A).

These investigations are part of the City's ongoing Remedial Investigation associated with the Portland Harbor City of Portland Outfalls Project being conducted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City. The data collected under these investigations support ongoing work by DEQ and the City to characterize and control discharges to the Basin 18 stormwater conveyance system.

Basin 18 Configuration and Background

Basin Physical System

Outfall 18 discharges to the west side of the Willamette River at approximately river mile 8.8. Figure 1 provides an overview of the Basin 18 stormwater conveyance system. Basin 18 is a 465-acre stormwater basin, including approximately 189 acres of industrial land, 7 acres of major transportation and 2 acres of residential land. The remainder of the drainage area land use is open space within Forest Park.

The stormwater conveyance system consists of two main trunk lines and five main branches. The main trunk lines include a 72-inch-diameter line extending from NW Yeon Avenue to the outfall and a 48-inch-diameter line along NW Yeon. The two trunk lines intersect at City manhole AMZ087. In addition to drainage from the NW Yeon trunk line and the five main branches, the 72-inch-diameter trunk line receives drainage from the Burlington Northern Railroad Lake Yard and the Gunderson Inc. facilities.

Four of the five main branches convey runoff from properties on the south side of NW Yeon as shown on Figure 1 and described below:

- **Western Subbasin.** This subbasin receives drainage primarily from Forest Park but also from a few industrial facilities and a small portion of NW St. Helens Road. The branch line converges with the west-central subbasin at manhole AND536 and with the 72-inch-diameter main trunk line at manhole AMZ087.
- **West-Central Subbasin.** This subbasin receives drainage from Forest Park, numerous industrial facilities, and from NW St. Helens. This branch line converges with the western subbasin at manhole AND536 and with the 72-inch-diameter main trunk line at manhole AMZ087.
- **East-Central Subbasin.** This subbasin receives drainage from industrial properties and NW 35th Avenue. The line joins the NW Yeon main trunk line at manhole AMZ099.
- **Eastern Subbasin.** This subbasin receives drainage from a few industrial facilities and NW 35th Avenue. The junction of this branch with the NW Yeon trunk line is at manhole AMZ102.

The fifth branch conveys drainage from NW Front Avenue and a small portion of the Gunderson site to the 72-inch main trunk line at manholes AMZ093 and AAT537. This branch is downgradient of the LWG sampling location; samples representative of discharges from this branch were not collected during this investigation.

Previous Studies

Elevated concentrations of PCBs, metals, pesticides, and phthalates were detected in surface sediment samples collected by the City in 2002 near Outfall 18 (CH2M Hill, 2004). Following an evaluation of the outfall sediment data, the City designated Basin 18 as a Priority 1 basin for source investigation. Priority 1 designations were assigned to basins where significantly elevated contaminant concentrations had been detected in sediment near the outfall and further investigation efforts were needed to determine if these contaminants were being discharged to the City system.

As part of a pilot project in 2003, the City collected inline solids samples from the Basin 18 conveyance system to evaluate the feasibility of using inline solids as a source investigation tool and to identify basins where additional source investigation may be warranted (CH2M Hill, 2005). The investigation results indicated the potential presence of contaminant sources within the basin.

The City conducted further inline solids sampling in Basin 18 in 2004, in conjunction with routine stormwater line cleaning activities in the west-central subbasin, in the vicinity of Container Management Services and Wilhelm Trucking. Results of this investigation indicated elevated concentrations of PCBs, metals, phthalates, and PAHs in solids in the City stormwater lines in the vicinity of these two facilities (BES, 2006).

Based on contaminant concentrations in Willamette River sediment samples, Outfall 18 is within a river reach identified by EPA as an area of potential concern for PCBs, copper, lead, zinc, tributyltin, DDT, PAHs and phthalates (EPA, 2005), and by the LWG for PCBs, aldrin, and DDT (Integral, 2007). In 2009, EPA and LWG identified the inriver area in the vicinity of Outfall 18 as an area to be evaluated further in the forthcoming Portland Harbor Feasibility Study (EPA, 2009).

Potential Sources

Upland facilities identified as potential sources include DEQ Cleanup Program sites, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database, and facilities permitted by DEQ under the NPDES industrial stormwater discharge permit (1200Z) program due to stormwater exposures to industrial operations. These potential sources are depicted on Figure 1 and listed by subbasin in Table 1. The City delineated subbasin boundaries based on available site drainage information; as potential sources complete stormwater pathway investigations, subbasin boundaries may need revision to reflect additional drainage pathways.

LWG Sampling Activities

The LWG installed a series of sediment traps during 2007-08 in the 72-inch main trunk line, just downstream of manhole AMZ088 as shown on Figure 1. The sampling location was chosen because it is representative of a combination of heavy industrial and open space land uses, and locations closer to the outfall may have been compromised by river backup into the conveyance system. This sampling location includes all known discharges to the basin with the exception of discharges from the Burlington Northern Railroad Lake Yard (ECSI #100), Gunderson (ECSI #1155), and catch basins along NW Front Avenue.

The first set of sediment traps was deployed from March to June 2007 (Anchor and Integral, 2007, 2008a). Because the sample volume was not sufficient to conduct all desired analyses, the sample

was analyzed only for PCB congeners, organochlorine pesticides, PAHs, phthalates, total organic carbon (TOC), and total solids.

The LWG redeployed sediment traps, in the same location, during the fall and winter of 2007-08 to collect additional data for the stormwater loading evaluation and to evaluate whether trap bottle size influences stormwater solids accumulation in the traps (Anchor and Integral, 2008b). The traps included standard traps, as used in the first deployment, as well as traps using a shorter bottle size.¹ Sediment was collected from the traps and submitted for analysis on December 20, 2007 (primary and duplicate samples from the standard apparatus), January 31, 2008 (tall sample bottle apparatus), and February 1, 2008 (short bottle apparatus). The samples obtained during this second round of sampling were of sufficient volume for all proposed analyses, including PCB congeners, organochlorine pesticides, chlorinated herbicides, PAHs, phthalates, selected semivolatile organic compounds (SVOCs), metals, TOC, and total solids. Sediment trap deployments and subsequent analyses are summarized on Table 2.

City Sampling Activities

The two sampling periods, Spring 2007 and Fall 2008 through Spring 2009, are described below. Photographs of the sediment traps and inline solids sampling activities are provided in Attachment B. Field notes taken during sediment trap installation, monitoring, removal, and sample processing activities and notes from the collection of the inline solids samples are provided in Attachment C.

Spring 2007

The City's spring 2007 sampling activities were completed in accordance with the sampling and analysis plan (SAP) submitted to DEQ in April 2007 (BES, 2007). The SAP identified four sediment trap locations selected to represent discharges from the four main subbasins up-the-pipe from the LWG sample location and was designed to mirror the sampling and analytical procedures being implemented by LWG at the manhole AMZ088 location. The City installed two sediment traps at each of the four locations on March 14 and 15, 2007, as shown on Figure 1 and summarized below.

Subbasin	Trap #	Manhole (MH)	Description
Western	ST3	AND535	Upstream of MH in 42" line
West-Central	ST4	AAT466	Downstream of MH in 48" line
East-Central	ST2	AAT557	Upstream of MH in 42" line
Eastern	ST1	AAT565	At MH invert between 12" incoming and 12" outgoing lines

The sediment traps were inspected monthly, and accumulated sediments were removed on June 19, 2007. One inline solids grab sample was obtained from the incoming 42-inch-diameter line (i.e., same location as the traps) during trap removal at the east-central subbasin location (MH

¹ The LWG evaluation of the effect of bottle size on solids accumulation was inconclusive due to a sample compositing error that precluded the ability to compare sediment chemistry data for the two bottle sizes for identical deployment periods (Anchor and Integral, 2008b).

AAT557) to help fill anticipated data gaps resulting from low sample volumes. Approximately 0.1 to 0.7 inches of solids had accumulated in the trap bottles at the time of removal. In accordance with the BES Standard Operating Procedure 5.01b, "Sampling Stormwater Solids Using Inline Sediment Traps," field personnel filtered sediment bottle contents at the City's Water Pollution Control Laboratory to generate solids samples for laboratory analysis.

Sample volume for most of the samples was limited. Therefore, in accordance with the SAP, chemical analysis of the samples generally followed the LWG analytical program developed to prioritize analyses of potential risk drivers within Portland Harbor. Specifically, where sediment volumes were insufficient to conduct all proposed analyses, tests were conducted as feasible in the following order of priority: PCBs, TOC, percent solids, organochlorine pesticides, PAHs, phthalates, metals, herbicides, SVOCs and grain size. Due to the sample volume required for PCB congener analysis, sufficient volumes were not available at all locations to conduct this analysis as specified by the SAP. A decision was made to submit all samples for PCB Aroclor analysis so that PCB results would be generated for all locations and to facilitate evaluation of additional target analytes at two of the four locations. A summary of samples collected from each subbasin and the analyses conducted is provided in Table 2.

Fall 2008 through Spring 2009

The City redeployed sediment traps in Basin 18 to fill data gaps in the earlier data set and to evaluate solids capture rates of different bottle sizes and trap designs. Work was conducted in accordance with the SAP for the Winter 2009 Inline Sediment Trap Pilot Study, submitted to DEQ on December 18, 2008 (BES, 2008). The pilot study involved the design and installation of a new sediment trap model, and variations of the standard sediment trap, to evaluate how variables such as sediment trap design, bottle shape, and bottle aperture affect trapped solids volume. Sediment traps were placed at the same sampling stations used in 2007 and at one additional location, in the upstream portion of the east-central subbasin ("ST5", located upstream of manhole AAX261, in the 36-inch-diameter storm line entering the manhole from the east), as shown on Figure 1.

Four sediment traps were installed at each of the following locations: ST2, ST3, ST4, and ST5. At these locations, four different bottle types were deployed to increase solids volume captured and to evaluate capture rates of different bottle shapes. Because the small pipe diameter (12") impeded standard trap solids collection at location ST1 during the 2007 deployment, crews deployed a new "filter sock" trap for this investigation. The new trap has a lower profile and is angled into the flow, making it more conducive to smaller lines. It substitutes a two-chambered flow-through round stainless steel canister for the standard sample bottle, and material is removed from both chambers to consolidate solids for analysis. A summary of the pilot study sampling activities and performance of the different types of sediment traps is included in Attachment A.

The City installed the sediment traps at the five Basin 18 locations between October 30, 2008 and February 4, 2009. The sediment traps were inspected periodically during January through May 2009 to remove debris accumulated around the traps and to archive sample volumes as needed during the deployment. Final accumulated sediments were removed from all of the traps between June 9 and June 11, 2009, filtered² in accordance with BES Field Operations Standard

² Solids from ST1 were not filtered since the trap design allows water to pass through the trap, resulting in a sample with lower water content than the standard trap design.

Operating Procedure 5.01b "*Sampling Stormwater Solids Using Inline Sediment Traps*", and submitted for chemical analysis.

During trap removals at location ST5, the City collected one grab sample of inline solids from the 36-inch-diameter line, downstream of manhole AAX261 and the connections from two laterals discharging from the Wilhelm Trucking facility. Sediment traps could not be placed at this location due to debris accumulation in the line, and therefore were placed upstream of the manhole and the Wilhelm Trucking facility connections.

For some of the sample locations, accumulated sediment volume in the traps was insufficient to conduct all proposed analyses; in these cases, analyses were conducted as feasible in the order of priority for each location as established in the SAP (based on the results of the City's 2007 sediment sampling in Basin 18). The samples collected and analyses conducted on each sample are summarized in Table 2.

Summary of Results

Tables 3 and 4 summarize the laboratory analytical results for the City and LWG solids samples and include the Portland Harbor Joint Source Control Strategy (JSCS) screening level values (SLVs) for Bioaccumulation and Toxicity (DEQ/EPA, 2005). The total PCBs, pesticides (total DDx³, total chlordanes, and heptachlor) and metals (cadmium, chromium, copper, lead, and zinc) concentrations are displayed on Figures 2 through 4. The laboratory reports and data review memoranda for the City samples are provided in Attachment D.

The chemical analytical results for the LWG and City samples are summarized as follows:

PCBs:

- PCBs were detected at concentrations exceeding JSCS Bioaccumulation and/or Toxicity SLVs in the 2007 and 2009 samples from the west- and east-central subbasins and the LWG sample location. A comparison of these concentrations from concurrent deployments indicates that upland contaminant discharges to the west- and east-central subbasins could account for concentrations observed in the LWG sample.
- PCBs were not detected in the western subbasin samples from 2007 and 2009. In the eastern subbasin, PCBs were not detected in the 2007 sample. There was insufficient volume to analyze PCBs in the 2009 sample.
- In the City samples, PCB Aroclors 1248 and 1260 were the primary Aroclors detected. The LWG samples were not analyzed for PCB Aroclors.

Organochlorine Pesticides:

- The City pesticide data for the 2007 samples indicated the presence of total DDx and other pesticides (including aldrin, total chlordane, and heptachlor) sources in the west- and east-central subbasins. A comparison of concentrations observed in these subbasins during the concurrent LWG sediment trap deployment in 2007 supports that upland contaminant discharges to these subbasins may account for concentrations observed in the LWG sample.

³ Total DDx is the sum of total DDD, DDE, and DDT.

- Pesticides were not analyzed in the 2007 City samples from the eastern and western subbasins. The 2009 City samples from the eastern and western subbasins had relatively low pesticide concentrations.
- Pesticide concentrations in the 2009 samples from the west- and east-central subbasins were similar to the concentrations in the spring 2007 samples from the same subbasins and exceed JSCS Toxicity and/or Bioaccumulation SLVs.
- Total DDx concentrations for the two locations sampled within the east-central subbasin were similar, while the downstream location had higher concentrations of total chlordane and heptachlor, indicating potential pesticides sources in the upper and lower portions of the subbasin.

Metals:

- Samples from the west- and east-central subbasins exceeded JSCS Toxicity SLVs for arsenic, cadmium, chromium, copper, lead, manganese, nickel, and zinc. Samples from the western subbasin did not exceed JSCS Toxicity SLVs for metals. There was insufficient volume to analyze for metals in the sample from the eastern subbasin.
- In the east-central subbasin, most metals concentrations were higher at the upgradient sample location indicating a potential source in the upper portion of the subbasin.
- While some metals results exceed SLVs, almost all were within an order-of-magnitude of SLVs.

PAHs:

- In the City samples, few individual PAHs were detected in excess of the JSCS SLVs, and detections were within one order-of-magnitude of the SLVs. While a JSCS screening level for total PAH does not exist, total PAH concentrations in all City samples collected from the western, west-central and east-central subbasins are considered low. There was insufficient volume to analyze for PAHs in the eastern subbasin samples.
- Concentrations of several individual PAHs exceeded JSCS SLVs in the LWG 2007 sample, but all were within an order-of-magnitude of JSCS SLVs, with the exception of indeno(1,2,3-cd)pyrene. No individual PAHs were detected in excess of the SLVs in the subsequent LWG samples. The total PAH concentration in the July 2007 sample was higher than in the subsequent LWG samples and similar to total PAH concentrations in LWG sediment trap samples from other industrial basins (BES, 2010a).

Phthalates:

- The only phthalate detected in any of the samples at somewhat elevated concentrations was bis(2-ethylhexyl)phthalate (BEHP). BEHP was detected at relatively comparable concentrations in the City samples from the west- and east-central subbasins and in the July 2007 LWG sample (concentrations in the subsequent LWG samples were lower). Although the BEHP concentrations in these samples are considered slightly elevated relative to SLVs, the data as a whole do not indicate the presence of significant uncontrolled BEHP sources within the basin.

Method reporting limits (MRLs) for some City and LWG samples exceeded JSCS Toxicity SLVs for individual phthalates.

Chlorinated Herbicides:

- One or more samples collected from the LWG sampling location and from the western, west-central, and east-central subbasins were analyzed for herbicides. Herbicides were not detected in any of the analyzed samples.
- MRLs were elevated for herbicides analysis of the sample collected from the east-central subbasin.

Data Evaluation and Potential Sources

Due to data gaps that resulted from the City's 2007 subbasin deployments, traps were redeployed in 2009. Where sample volume was sufficient, analyses run on subbasin samples in 2007 were repeated in 2009, allowing for a potential comparison of concentrations over time to evaluate whether contaminant sources have been controlled. However, available paired data are limited and clear trends are not apparent.

The primary objective of the City's sediment trap deployment in 2007 was to compare subbasin data to the data collected by the LWG from the broader drainage area in order to identify subbasins where further source tracing and/or control was needed for specific contaminants of interest. While the comparison of 2007 and 2009 subbasin data did not indicate whether contaminant sources are being controlled (given the limited availability of paired data), an evaluation of the collective data sets from each subbasin in the context of known potential sources (see Table 1) was conducted to identify areas where further work is needed by the City and/or DEQ to locate, characterize, or control additional sources, as discussed below.

Western Subbasin

Sediment trap concentrations for all contaminants were low. Three DEQ Cleanup sites are present in this subbasin. Two are in the process of evaluating contaminant discharges via the stormwater pathway (Christenson Oil - ECSI #2426 and Shell/Texaco Terminal - ECSI #169). The third, McWhorter Inc. (ECSI #135), did not evaluate the stormwater pathway but has been remediated under DEQ oversight. No further source tracing is needed in this subbasin at this time.

West-central Subbasin

The results indicate the presence of potentially significant uncontrolled sources of PCBs and pesticides in this subbasin. In 2004, the City conducted a source investigation in the west-central subbasin that identified two sites now in the DEQ Cleanup program (BES, 2006); Container Management Services (ECSI # 4784) and Wilhelm Trucking (ECSI #69) are both in the process of evaluating contaminant discharges via the stormwater pathway. The City removed contaminated solids from the storm system adjacent to these sites as part of the 2004 investigation. Elevated concentrations of PCBs and pesticides in the 2007 and 2009 sediment traps support that there are current sources in the subbasin.

A preliminary review of data collected by Container Management and provided by DEQ indicates that pesticides (including DDx and chlordanes) and PCBs are present in erodible soils and catch basin solids (DEQ, 2010). In addition, a small portion of the Univar site (Van Waters & Rogers; ECSI #330) discharges to this subbasin. Site COIs include lead and pesticides and a stormwater pathway evaluation has been initiated at this site under EPA oversight. Data

collected by all of these sites will be reviewed to determine whether additional source identification efforts are needed in this subbasin.

East-central Subbasin

Results from the east-central subbasin are similar to those from the west-central subbasin, with the exception of metals, which are generally higher in this subbasin. Concentrations indicate the presence of potentially significant uncontrolled sources of PCBs, pesticides, and metals. As part of the 2003 pilot study investigation, an inline solids sample was collected from this subbasin at the same location as the City sediment trap deployments. PCBs, pesticides, and metals concentrations were elevated and were the highest of the six locations sampled in Basin 18 (CH2M Hill, 2005). The subbasin may include historic or current contributions from sources in the adjacent west-central subbasin (e.g., Container Management) as a result of historic connections, drainage patterns, and offsite tracking of contaminants. There are also multiple known sources within the subbasin, as summarized below.

- ANRFS Holdings Inc./ABF Freight Systems, Inc. (ECSI #1820): Site contaminants of interest (COIs) include PCBs and metals. The site was evaluated by DEQ in 2007 during pilot site discovery efforts and was asked to clean out all site stormwater lines based on detections of PCBs and metals (DEQ, 2008a). Pesticides were not detected. The status of the requested line cleanout is unknown.
- Carson Oil (ECSI #1405): Site COIs include PCBs and metals. This site was evaluated during the 2007 DEQ site discovery efforts and requested to enter the Cleanup program based on detections of PCBs and phthalates (DEQ, 2008b). Pesticides were not detected. Carson Oil declined to enter the program but has informed DEQ that it is working independently to address stormwater concerns.
- Columbia American Plating (CAP; ECSI #29): Site COIs include PCBs and metals. A stormwater pathway evaluation is underway at this site under a Consent Decree between DEQ and the new property owner. Investigation of the pathway has included collection of solids samples in the onsite and adjacent City stormwater conveyance systems. Data confirm that the site is a source of PCBs and metals to the City system (O'Gara, 2009). Pesticides have not been detected in site samples to date, though some detection limits were elevated. A portion of the site drainage system has been disconnected from the City system and site redevelopment under the City Stormwater Manual, which requires stormwater treatment, is pending.
- Container Recovery Inc. (ECSI #4015): Site COIs include PCBs and metals. This site was evaluated during the 2007 DEQ site discovery efforts and requested to enter the Cleanup program based on detections of PCBs, metals, PAHs and phthalates (DEQ, 2008c). Pesticides were not detected. Container Recovery declined to enter the program but has informed DEQ that it is working independently to address stormwater concerns.
- Wilhelm Trucking (ECSI #69): Site COIs include lead. The site has entered the DEQ Cleanup program to evaluate the stormwater pathway but data are not yet available. Stormwater solids sample analyses will include PCBs, metals, and pesticides.
- Univar (Van Waters & Rogers; ECSI #330): Site COIs include lead and pesticides. A stormwater pathway evaluation has been initiated at this site under EPA oversight. Samples of stormwater and stormwater solids will be collected from the City system in the vicinity of the site to assess the potential for site discharges to be a source to Basin 18. The City provided

comments to EPA that proposed data collection should include sampling and analysis of site discharges (BES, 2010b). Data will be reviewed as they become available to inform the City's understanding of sources in this subbasin.

Eastern Subbasin

Sediment trap sample volumes in this subbasin were low, resulting in limited chemical analyses (PCBs and pesticides). PCBs were not detected and pesticides concentrations were low. An inline solids sample was collected by the City in 2003 that represented the eastern subbasin and a portion of drainage from NW Yeon (CH2M Hill, 2005). Though detection limits were elevated for some analyses, results did not indicate that significant sources were discharging to the subbasin.

The subbasin includes three inactive DEQ Cleanup sites: Ashland Chemical/Hill Investment (ECSI #1076), Owens Corning/Trumbull Asphalt (ECSI #1160), and Schnitzer Investment (ECSI #2424). DEQ evaluated catch basin solids samples collected from the Ashland Chemical and Owens Corning sites as part of the 2007 site discovery program. DEQ requested Ashland Chemical to clean out their storm system based on detected concentrations of PCBs, metals, and phthalates (DEQ, 2008d). Facility operations were relocated in 2008 and the system was cleaned before vacating the property. In response to detections of PCBs, metals, and PAHs at Owens Corning, DEQ requested that the site enter into a Cleanup agreement to conduct a stormwater evaluation (DEQ, 2008e). The site declined to enter the DEQ Voluntary Cleanup Program but has been working with the City Industrial Stormwater Program to continue evaluating and implementing BMPs under the NPDES 1200-Z permit.

Conclusions and Next Steps

The analytical data for the inline solids samples collected by the City and the LWG indicate the potential presence of uncontrolled PCBs, pesticides, and metals sources within Basin 18. Specifically, the City investigations in subbasins upstream of the LWG sampling location indicate sources of these contaminants in the west-central and east-central subbasins. Consistent with the findings of the 2003 inline solids investigation conducted by the City in Basin 18, the 2007 - 2009 solids sampling results do not indicate that contaminated solids are being discharged to the western and eastern subbasins.

Known sources likely account for pollutant concentrations observed in the west-central and east-central subbasins. The City has identified the following next steps for site source identification and control in these areas.

West -Central Subbasin:

1. Coordinate with DEQ on the review of work plans and reports related to the stormwater pathway evaluations at the Container Management and Wilhelm sites. Evaluate data collected to characterize site discharges to determine whether additional source identification is needed in this subbasin.
2. Work with DEQ to ensure that the Container Management and Wilhelm sites evaluate and address known offsite migration of contaminants to the City stormwater conveyance system. The City last cleaned the adjacent lines in 2004; sediment trap data indicate that additional line cleaning may be warranted to remove contaminated solids.

3. Coordinate with EPA on the Univar stormwater pathway evaluation to review characterization data and source control concerns relevant to the west-central subbasin.

East-Central Subbasin:

1. Coordinate with DEQ and EPA on the review of work plans and reports related to the stormwater pathway evaluations at the CAP, Wilhelm, and Univar sites. Evaluate data collected to characterize site discharges to determine whether additional source identification is needed in this subbasin.
2. In 2009, the CAP site investigated and cleaned a portion of the City storm system in this subbasin. Results indicated the presence of contaminated solids in the system in the vicinity of the site. To identify the nature and extent of contaminated solids in the City line, the City collected and analyzed inline solids from a number of locations above and below CAP connections. Data have been provided to DEQ and the City has initiated line cleaning to remove contaminated solids. Further discussions are needed with DEQ and the current owner of CAP to evaluate respective responsibilities for line cleaning costs and additional monitoring in this subbasin.

Stormwater pathway evaluations either are in progress or are in the planning stages at numerous DEQ cleanup sites within Basin 18. Once source control evaluations and measures have been completed at identified cleanup sites, the City anticipates collecting additional data to determine the need for any further source tracing and/or source control activities in the basin.

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Letter from Tim O'Gara to Mark Pugh, DEQ. September 29, 2009.

Tables

Table 1 – Summary of Potential Upland Sources in Subbasins of Basin 18

Table 2 – Summary of Basin Inline Solids Sample Collection and Analysis

Table 3 – Summary of Chemical Analytical Results, Inline Solids Samples, Basin 18

Table 4 – Summary of Polychlorinated Biphenyl Congener Analytical Results, LWG Sediment
Trap Solids Sample, Outfall Basin 18

Figures

Figure 1 – Outfall 18 Drainage Basin Overview

Figure 2 – Basin 18 Inline Solids – Total PCBs

Figure 3 – Basin 18 Inline Solids – Pesticides (Total DDX, Total Chlordane, and Heptachlor)

Figure 4 – Basin 18 Inline Solids – Metals (Cd, Cr, Cu, Pb, and Zn)

Attachments

Attachment A – City of Portland Outfalls Project Winter 2009 Inline Sediment Trap Pilot Study
Summary Report

Attachment B – Field Photographs

Attachment C – Field Notes

Attachment D – Laboratory Results

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1801. It is a very important document, as it is the first time that the President has addressed the Congress since the establishment of the office.

2. The second part of the document is a report from the Secretary of the Navy, dated January 10, 1801. It contains information about the state of the Navy and the ships that are in service.

3. The third part of the document is a report from the Secretary of the Treasury, dated January 15, 1801. It contains information about the state of the Treasury and the finances of the government.

4. The fourth part of the document is a report from the Secretary of the War, dated January 20, 1801. It contains information about the state of the War and the troops that are in service.

5. The fifth part of the document is a report from the Secretary of the Interior, dated January 25, 1801. It contains information about the state of the Interior and the land that is in service.

6. The sixth part of the document is a report from the Secretary of the State, dated January 30, 1801. It contains information about the state of the State and the relations with other countries.

Table 1. Summary of Potential Upland Sources in Subbasins of Basin 18

Subbasin	Information on Potential Upland Sources (DEQ Cleanup Sites and NPDES 1200Z Permit Sites)					
	Potential Upland Sources	DEQ Cleanup (ECSI) Site	NPDES 1200Z Permitted Site ⁽¹⁾	Site Contaminants of Interest ⁽²⁾	DEQ Cleanup Program Status	Site Stormwater Pathway Evaluated Under DEQ Oversight?
Western	Christenson Oil (ECSI #2426)	X	X	Cadmium, copper, lead, mercury, zinc, PAHs, VOCs, TPH	Active	In process
	McWhorter Inc. (ECSI #135)	X		VOCs, SVOCs, PAHs, TPH, phthalates	Active	In process
	Shell/Texaco Terminal (ECSI #169)	X	X	PAHs, VOCs, TPH	Active	In process
West-Central	Container Management Services (ECSI #4784)	X	X	PCBs, lead, mercury, zinc, PAHs, PCBs, TPH	Active	In process
	Wilhelm Trucking (ECSI #69)	X	X	Lead	Active	In process
	Univar (Van Waters & Rogers) (ECSI #330)	X		Lead, pesticides, TPH, VOCs	Active (under EPA oversight)	In process
East-Central	ANRFS / ABF Freight Systems / ANRFS Holdings Inc. (ECSI #1820)	X	X	Arsenic, chromium, copper, zinc, PCBs, PAHs, BEHP	Inactive	No
	Carson Oil (ECSI #1405)	X	X	VOCs, PAHs, TPH, arsenic, chromium, copper, zinc, PCBs, BEHP	Inactive	No
	Columbia American Plating (ECSI #29)	X		Lead, PCBs, VOCs, SVOCs	Active	In process
	Container Recovery Inc. (ECSI #4015)	X	X	Cadmium, lead, zinc, PAHs, PCBs, phthalates	Inactive	No
	Magnus / Wilhelm Trucking (ECSI #69)	X	X	Lead	Active	In process
	MRP Environmental ⁽³⁾		X	(Site not listed in Table 4.4-4 of Draft RI Report)	N/A	N/A
	Univar (Van Waters & Rogers) (ECSI #330)	X		Lead, pesticides, TPH, VOCs	Active (under EPA oversight)	In process
Eastern	Ashland Chemical / Hill Investment (ECSI #1076)	X		Arsenic, chromium, copper, zinc, PCBs, PAHs, BEHP	Inactive	No
	Owens Corning / Trumbull Asphalt (ECSI #1160)	X	X	PAHs, PCBs, phthalates, arsenic, chromium, copper, zinc	Inactive	No
	Schnitzer Investment (ECSI #2424)	X		VOCs, SVOCs, metals	Inactive	No
Other	Burlington Northern Railroad Lake Yard (ECSI #100) / Pacific Rail Services	X	X	Antimony, arsenic, cadmium, chromium, copper, mercury, selenium, zinc, PAHs, PCBs, phenols, TPH, VOCs, sodium cyanide, ethylene glycol, creosote	Active	In process
	Gunderson LLC (ECSI #1155)	X	X	TPH, butyltins, PCBs, phthalates, arsenic, copper, chromium, zinc	Active	In process
	Texaco/Equilon Pipeline (ECSI #2117) ⁽⁴⁾	X		PAHs, VOCs, TPH	Inactive	N/A

Notes:

N/A = not applicable.

⁽¹⁾ Except as noted, reference for NPDES 1200Z permit holders is *BES Industrial Stormwater, Portland Harbor Permits – Sorted by Outfall, Report Date: 10/23/09*. NPDES 1200Z permits allow discharges of permitted analytes up to the designated benchmark concentrations. NPDES 1200Z permit analytes and benchmarks include copper (100 ug/L), lead (400 ug/L), and zinc (600 ug/L).

⁽²⁾ Contaminants of interest (COI) for DEQ ECSI sites identified in Table 4.4-4 of the *Portland Harbor RI/FS Remedial investigation Report Draft* (Integral Consulting and others, 2009). The listing of "TPH" as a COI implies that PAHs are COIs because TPH consists of PAHs in addition to other compounds.

⁽³⁾ Company vacated the premises in March 2010.

⁽⁴⁾ This site is underground (i.e., consists of a pipeline) and had no stormwater pathway other than potential infiltration from the pipeline to subsurface utilities.

Table 2. Summary of Basin 18 Inline Solids Sample Collection and Analyses

Data Source	Location		Sample Date	Sediment Trap Deployment		Analytical Testing ⁽¹⁾								
	Subbasin	Manhole ID#		Season	Period (Days)	PCB Congeners	Total Solids	TOC	Pesticides	SVOCs	PAHs & Phthalates	Metals	Herbicides	PCB Aroclors
LWG Round 3A and 3B Stormwater Sampling ⁽²⁾	Downstream/ Main Trunk Line	AMZ088	07/02/07	Mar - Jul	109	X	X	X	X		X			
			12/20/07	Nov - Dec	38 ⁽³⁾	X	X	X	X		X	X	X	
			12/20/07	Nov - Dec	38 ⁽³⁾	X	X	X	X		X	X	X	
			01/31/08	Nov - Jan	80 ⁽³⁾	X	X	X	X		X	X	X	
			02/01/08	Nov - Feb	81 ⁽³⁾	X	X	X	X		X	X	X	
City Inline Solids Source Investigations	Western	AND535 (ST3)	06/20/07	Mar - Jun	97		X	X						X
			06/09/09	Dec - Jun	182		X	X	X		X	X	X	X
	West-Central	AAT466 (ST4)	06/20/07	Mar - Jun	97		X	X	X	X	X	X		X
			06/10/09	Dec - June	183		X	X	X		X	X	X	X
	East-Central	AAT557 (ST2)	06/19/07	Mar - Jun	96		X	X	X	X	X			X
			06/19/07 (Inline Grab)	NA	NA		X	X	X	X	X	X	X	X
			06/09/09	Oct - Jun	222		X	X	X		X	X		X
		AAX261 (ST5)	06/04/09 (Inline Grab)	NA	NA		X	X	X	X	X	X	X	X
			06/10/09	Dec - Jun	183		X	X	X		X	X		X
	Eastern	AAT565 (ST1)	06/19/07	Mar - Jun	97		X	X						X
			06/11/09	Feb - Jun	127		X	X	X					

Notes:

NA = not applicable (inline grab samples)

(1) PCBs = polychlorinated biphenyls; TOC = total organic carbon; pesticides = organochlorine pesticides, SVOCs = semivolatile organic compounds; PAHs = polycyclic aromatic hydrocarbons; herbicides = chlorinated herbicides

(2) Refer to Anchor and Integral, 2008b. Round 3A and 3B Stormwater Data Report.

(3) Deployment period calculated based on a sediment trap deployment date of 11/12/07, as indicated in the Round 3B Upland Stormwater Sampling Field Sampling Report (Anchor and Integral, 2008a).

Table 3
Summary of Chemical Analytical Results
Inline Solids Samples
Outfall Basin 18

Class Analyte Units			LWG Samples ⁽¹⁾					City Samples												JSCS ⁽²⁾ Screening Level Value		
			NW Yeon Trunk Line					Western Subbasin			West-Central Subbasin		East-Central Subbasin					Eastern Subbasin				
			Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Inline Solids Grab	Sediment Trap Solids	Sediment Trap Solids	Inline Solids Grab	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids			
			Manhole AMZ088	Manhole AMZ088	Manhole AMZ088 Field Duplicate	Manhole AMZ088	Manhole AMZ088	ST3: FO070808 Upstream of manhole in 42" line	ST3: FO095694 Upstream of manhole in 42" line	ST3: FO095697 Field Duplicate	ST4: FO070809 Downstream of manhole in 48" line	ST4: FO095695 Downstream of manhole in 48" line	ST5: FO095671 Downstream of manhole in 42" line	ST5: FO095696 Upstream of manhole in 36" line	ST2: FO070806 Upstream of manhole in 42" line	ST2: FO070807 Upstream of manhole in 42" line	ST2: FO095693 manhole AAT557 Upstream of Manhole in 42" line	ST1: FO070805 Manhole AAT565 In manhole, adjacent to catch basin lateral	ST1: FO095692 Manhole AAT565 Upstream of manhole in 12" line			
			7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008	6/20/2007	6/9/2009	6/9/2009	6/20/2007	6/10/2009	6/4/2009	6/10/2009	6/19/2007	6/19/2007	6/9/2009	6/19/2007	6/11/2009	(Toxicity)	(Bioaccumulation)	
Total Organic Carbon (ASTM D4129-82M)			%	3.72	3.71	4.19	6.47	4.66	3.56	1.37	1.98	5.61	4	0.0786	9.06	10.6	9.11	5.22	NA	16.9	--	--
Total Solids (EPA 160.3M)			%	39.5	54.7 T	50.5	45	54.1	59.1	56.5	NA	66.3	65.9	63.5	59.7	54	7.18	45.9	54.7	39.2	--	--
Grain Size (ASTM D421/422)																						
Gravel (<4750 µm)			Fract %	NA	NA	NA	NA	NA	NA	0.7	1.1	NA	0.1	6.2	NA	NA	NA	NA	NA	NA	--	--
Coarse Sand (4750-2000 µm)			Fract %	NA	NA	NA	NA	NA	NA	2.8	3.0	NA	0.3	1.4	NA	NA	NA	NA	NA	NA	--	--
Medium Sand (2000-425 µm)			Fract %	NA	NA	NA	NA	NA	NA	8.3	7.4	NA	9.0	21.3	NA	NA	NA	NA	NA	NA	--	--
Fine Sand (425-75 µm)			Fract %	NA	NA	NA	NA	NA	NA	23.6	23.6	NA	32.2	61.7	NA	NA	NA	NA	NA	NA	--	--
Silt (3.2-75 µm)			Fract %	NA	NA	NA	NA	NA	NA	58.1	56.5	NA	47.3	5.0	NA	NA	NA	NA	NA	NA	--	--
Clay (<3.2 µm)			Fract %	NA	NA	NA	NA	NA	NA	6.8	8.5	NA	11.1	4.6	NA	NA	NA	NA	NA	NA	--	--
Metals (EPA 6020)																						
Aluminum (EPA 6010B)			mg/Kg	NA	10,000	9,320	10,300 T	10,500	NA	NA	NA	11300	NA	12200	NA	NA	13800	NA	NA	NA	--	--
Antimony			mg/Kg	NA	0.72 J	0.67 J	1.24 JT	0.64 J	NA	NA	NA	1.68	NA	0.16	NA	NA	9.1	NA	NA	NA	64	--
Arsenic			mg/Kg	NA	3.56	2.89	2.45 T	2.36	NA	2.01	2.06	2.8	2.85	2.14	3.54	NA	114	4.75	NA	NA	33	7
Cadmium			mg/Kg	NA	0.624	0.619	0.653 T	0.548	NA	0.20	0.21	1.3	1.01	91.5	24.9	NA	8.4	0.34	NA	NA	4.98	1
Chromium			mg/Kg	NA	37.5	40.8	25.9 T	22	NA	24.3	24.9	62.4	60.5	0.17	142	NA	33.9	43.8	NA	NA	111	--
Copper			mg/Kg	NA	38	49.2	37.9 T	32.3	NA	15.2	14.6	82.1	67.8	16.5	192	NA	79.8	46.9	NA	NA	149	--
Lead			mg/Kg	NA	78.9	67.6	58.3 T	46.5	NA	12.6	12.1	220	164	6.11	285	NA	128	22.6	NA	NA	128	17
Manganese (EPA 6010B)			mg/Kg	NA	NA	NA	NA	NA	NA	901	874	509	548	347	367	NA	111,000	754	NA	NA	1100	--
Mercury (EPA 7471A)			mg/Kg	NA	0.161 J	0.062 J	0.113 JT	0.082 J	NA	0.033	0.031	0.36	0.305	0.018	0.299	NA	0.12	0.260	NA	NA	1.06	0.07
Nickel			mg/Kg	NA	16.5	17.8	17.3 T	13.9	NA	13.8	13.4	22.8	25.5	19.2	73.3	NA	36	30.2	NA	NA	48.6	--
Selenium			mg/Kg	NA	0.4 J	0.7 J	0.6 JT	0.3 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	--
Silver			mg/Kg	NA	0.117 J	0.12 J	0.233 JT	0.125 J	NA	0.10 U	0.10 U	0.25	0.14	0.10 U	1.60	NA	0.35	0.24	NA	NA	5	--
Zinc (EPA 6010B)			mg/Kg	NA	1,020	280	289 T	229	NA	79.5	75.0	584	436	58.9	897	NA	2,470	172	NA	NA	459	--
Organochlorine Pesticides (EPA 8081A)																						
2,4'-DDD			ug/Kg	47 NJ	7.1 NJ	9.5 NJ	9.9 NJ	5.7 NJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
2,4'-DDE			ug/Kg	0.92 U	0.79 U	1.2 U	1.7 NJ	0.82 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
2,4'-DDT			ug/Kg	17	2.8 J	5	4 J	2.6 NJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
4,4'-DDD ⁽³⁾			ug/Kg	47 J	5.8	11	8.2	4.8 J	NA	1.0 U	1.2 U	49	72	0.70 JP	45	69	19	55	NA	5.9 U	28	0.33
4,4'-DDE ⁽³⁾			ug/Kg	66 J	9.3	13	12 J	7.3 J	NA	1.5	1.3	57	61	0.97	68	100	26	66	NA	3.4 JP	31.3	0.33
4,4'-DDT ⁽³⁾			ug/Kg	32 U	6.5	9.5	11 J	3 U	NA	1.1 U	1.2 U	33 U	33 U	0.46 JP	95 P	44 U	19 U	23 U	NA	19 U	62.9	0.33
Estimated Total DDx ⁽⁴⁾			ug/Kg	177 NJ	31.5 NJ	48 NJ	46.8 NJ	20.4 J	NA	1.5	1.3	106	133	2.13 JP	208 P	169	62	121	NA	3.4 JP	--	0.33
Aldrin			ug/Kg	21 J	2.5	9.5	4.1 U	0.78 U	NA	0.66 J	0.94 J	17	24	0.54 JP	29 U	16	3.5 U	78	NA	5.7 U	40	--
alpha-BHC (α-BHC)			ug/Kg	2 U	0.19 U	0.22 U	0.23 U	0.19 U	NA	1.0 U	1.2 U	7.6 U	0.52 JP	0.79 U	8.9 U	9.3 U	3.7 U	2.2 U	NA	5.7 U	--	--
beta-BHC (β-BHC)			ug/Kg	11 U	1.3 U	1.7 U	1.9 U	2.1 U	NA	1.0 U	1.2 U	13 U	1.9 U	0.79 U	3.7 U	9.3 U	4.2 U	2.2 U	NA	5.7 U	--	--
delta-BHC (δ-BHC)			ug/Kg	2.5 U	0.18 U	0.22 U	0.85 U	0.16 U	NA	1.0 U	1.2 U	7.6 U	2.9 U	0.79 U	3.7 U	9.3 U	90 U	4.8 U	NA	5.7 U	--	--
gamma-BHC (γ-BHC, Lindane)			ug/Kg	3.7 J	0.79 U	0.93 U	0.97 U	0.78 U	NA	1.0 U	1.2 U	7.6 U	12 P	0.79 U	12 U	9.3 U	4.8 U	7.9 U	NA	12 P	4.99	--
alpha-Chlordane ⁽⁵⁾			ug/Kg	19	3 J	3.8 J	5.8	4.3	NA	0.24 J	0.55 JP	20	21	0.15 JP	23 U	34	11	52	NA	11 U	--	--
beta-Chlordane ⁽⁵⁾			ug/Kg	51 J	6.2	8.1	24	21	NA	1.0 U	0.34 JP	31	29	0.19 JP	25 U	87	52	350	NA	20	--	--
Total Chlordane ⁽⁶⁾			ug/Kg	70 J	9.2 J	11.9 J	29.8	25.3	NA	0.24 J	0.89 JP	51	50	0.34 JP	ND	121	63	402	NA	20	17.6	0.37
Oxychlordane			ug/Kg	3.9 U	0.84 U	0.92 U	0.99 U	0.78 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
cis-Nonachlor			ug/Kg	12	2.6 U	3.8 U	4.9 U	1.8 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
trans-Nonachlor			ug/Kg	12	1.3 J	2 U	3.6 J	2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	--
Dieldrin			ug/Kg	13 U	2.9	3.6	2.6 J	1.3 J	NA	1.0 U	1.2 U	18 P	24	0.79 U	13 U	40 P	4.4 P	3.8 P	NA	5.7 U	61.8	0.0081
Endosulfan I			ug/Kg	5.9 U	0.84 NJ	1.1 NJ	0.97 U	0.78 U	NA	0.083 JP	0.21 JP	14 P	9.1	0.13 JP	8.4	22 P	8.8	5.2 U	NA	9.3 U	--	--
Endosulfan II			ug/Kg	0.62 U	1.2 NJ	1.5 NJ	1.2	0.98 U	NA	1.0 U	1.2 U	7.6 U	5.6 U	0.79 U	20 U	16 P	3.5 U	18 U	NA	5.7 U	--	--
Endosulfan sulfate			ug/Kg	7.8 U	0.79 U	1.3 U	0.97 U	0.96 U	NA	1.0 U	1.2 U	36	2.4 P	0.79 U	4 P	15 U	3.5 U	2.4	NA	5.7 U	--	--
Endrin			ug/Kg	4.1 U	0.19 U	0.93 U	0.23 U	0.18 U	NA	1.0 U	1.2 U	7.6 U	1.9 U	0.79 U	3.7 U	9.3 U	3.5 U	3.2 U	NA	5.7 U	207	--
Endrin aldehyde			ug/Kg	4 U	0.19 U	0.22 U	0.98 U	0.19 U	NA	1.0 U	1.2 U</											

JULY 2010

Table 3
Summary of Chemical Analytical Results
Inline Solids Samples
Outfall Basin 18

Class Analyte		LWG Samples ⁽¹⁾					City Samples													JSCS ⁽²⁾ Screening Level Value	
		NW Yeon Trunk Line					Western Subbasin			West-Central Subbasin		East-Central Subbasin					Eastern Subbasin				
		Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Inline Solids Grab	Sediment Trap Solids	Sediment Trap Solids	Inline Solids Grab	Sediment Trap Solids	Sediment Trap Solids			
		Manhole AMZ088 Field Duplicate					ST3: FO070808 Upstream of manhole in 42" line	ST3: FO095694 Upstream of manhole in 42" line	ST3: FO095697 Field Duplicate	ST4: FO070809 Downstream of manhole in 48" line	ST4: FO095695 Downstream of manhole in 48" line	ST5: FO095671 Downstream of manhole in 42" line	ST5: FO095696 Upstream of manhole in 36" line	ST2: FO070806 Upstream of manhole in 42" line	ST2: FO070807 Upstream of manhole in 42" line	ST2: FO095693 Upstream of manhole in 42" line	ST1: FO070805 In manhole, adjacent to catch basin lateral	ST1: FO095692 Upstream of manhole in 12" line			
		Units	7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008	6/20/2007	6/9/2009	6/9/2009	6/20/2007	6/10/2009	6/4/2009	6/10/2009	6/19/2007	6/19/2007	6/9/2009	6/19/2007	6/11/2009		
Semi-Volatile Organic Compounds (EPA8270C)																		(Toxicity)	(Bioaccumulation)		
	1,2,4-Trichlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	9200	--	
	1,2-Dichlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	1700	--	
	1,3-Dichlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	300	--	
	1,4-Dichlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	300	--	
	2,4,5-Trichlorophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	78	NA	NA	NA	--	--	
	2,4,6-Trichlorophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2,4-Dichlorophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2,4-Dimethylpheno	ug/Kg	NA	NA	NA	NA	NA	NA	NA	1600 U	NA	40 U	NA	3100 U	350 U	NA	NA	NA	--	--	
	2,4-Dinitrophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	6100 U	NA	160 U	NA	13000 U	1400 U	NA	NA	NA	--	--	
	2,4-Dinitrotoluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2,6-Dinitrotoluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2-Chloronaphthalene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2-Chlorophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2-Methyl-4,6-dinitrophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	3100 U	NA	7.9 U	NA	6100 U	700 U	NA	NA	NA	--	--	
	2-Methylphenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	2-Nitroaniline	ug/Kg	NA	NA	NA	NA	NA	NA	NA	610 U	NA	16 U	NA	1300 U	140 U	NA	NA	NA	--	--	
	2-Nitrophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	3,3'-Dichlorobenzidine	ug/Kg	NA	NA	NA	NA	NA	NA	NA	3100 U	NA	79 U	NA	6100 U	700 U	NA	NA	NA	--	--	
	3-Nitroaniline	ug/Kg	NA	NA	NA	NA	NA	NA	NA	610 U	NA	16 U	NA	1300 U	140 U	NA	NA	NA	--	--	
	4-Bromophenylphenyl ether	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	4-Chloro-3-methylphenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	4-Chloroaniline	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	4-Chlorophenyl phenyl ether	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	4-Methylphenol ⁽⁷⁾	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	4-Nitroaniline	ug/Kg	NA	NA	NA	NA	NA	NA	NA	610 U	NA	16 U	NA	1300 U	140 U	NA	NA	NA	--	--	
	4-Nitrophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	3100 U	NA	79 U	NA	6100 U	700 U	NA	NA	NA	--	--	
	Benzoic acid	ug/Kg	NA	NA	NA	NA	NA	NA	NA	6100 U	NA	99 U	NA	13000 U	1400 U	NA	NA	NA	--	--	
	Benzyl alcohol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	610 U	NA	16 U	NA	1300 U	140 U	NA	NA	NA	--	--	
	Bis(2-chloroethoxy) methane	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Bis(2-chloroethyl) ether	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Bis(2-chloroisopropyl) ether	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Hexachlorobenzene	ug/Kg	2.7 U	0.48 U	0.93 U	2.3	1.6	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	100	19	
	Hexachlorobutadiene	ug/Kg	2.8 U	0.26 U	0.51 U	0.32 U	0.26 U	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	600	--	
	Hexachlorocyclopentadiene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	1600 U	NA	40 U	NA	3100 U	410 U	NA	NA	NA	400	--	
	Hexachloroethane	ug/Kg	3.2 U	0.32 U	0.37 U	0.39 U	0.31 U	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Isophorone	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Nitrobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	N-Nitrosodi-n-propylamine	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	N-Nitrosodiphenylamine	ug/Kg	NA	NA	NA	NA	NA	NA	NA	310 U	NA	7.9 U	NA	610 U	70 U	NA	NA	NA	--	--	
	Pentachlorophenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	3100 U	NA	79 U	NA	6100 U	700 U	NA	NA	NA	1000	250	
	Phenol	ug/Kg	NA	NA	NA	NA	NA	NA	NA	910 U	NA	5.0 U	NA	1900 U	210 U	NA	NA	NA	50	--	

Notes:

N = Presumptive evidence of compound

P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).

T = Value is an average or selected result

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

J = The analyte was detected at a concentration between the method detection limit and the method reporting limit

NA = Not analyzed

ND = Not detected

-- = No JSCS screening level available

ug/Kg = Micrograms per kilogram

mg/Kg = Milligrams per kilogram

⁽¹⁾ Refer to Anchor and Integral, 2007, 2008a, and 2008b.

⁽²⁾ JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007)

⁽³⁾ The toxicity SLV represents the sum of the 2,4' and 4,4' isomers

⁽⁴⁾ Estimated Total DDx is the sum of DDE, DDD and DDT

⁽⁵⁾ Alpha-Chlordane also is known as cis-Chlordane. Beta-Chlordane also is known as trans-Chlordane and gamma-Chlordane.

⁽⁶⁾ Total Chlordane is the sum of alpha- and beta-Chlordane

⁽⁷⁾ Total PCBs and PAHs are calculated by assigning "0" to undetected constituents

⁽⁸⁾ Individual congener results are summarized in Table 3

⁽⁹⁾ This analyte cannot be separated from 3-Methylphenol

█ = concentration exceeds JSCS Toxicity Screening Level Value

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value

Table 4
Summary of Polychlorinated Biphenyl Congener Analytical Results
LWG Sediment Trap Solids Sample
Outfall Basin 18

IUPAC Number ⁽³⁾ Chemical Name Units			LWG Sample ⁽¹⁾					JSCS ⁽²⁾ Screening Level Value (Toxicity) (Bioaccumulation)	
			NW Yeon Trunk Line						
			Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids		
			Manhole AMZ088	Manhole AMZ088	Manhole AMZ088 Field Duplicate	Manhole AMZ088	Manhole AMZ088		
			7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008		
Chlorinated Biphenyl Congeners (EPA 1668A)									
PCB 1	2-MoCB	ug/Kg	0.197	0.253	0.0263	0.0415 T	0.0288	--	--
PCB 2	3-MoCB	ug/Kg	0.0537	0.0702	0.0117 J	0.0166 JT	0.0122 J	--	--
PCB 3	4-MoCB	ug/Kg	0.217	0.475	0.0254	0.0426 T	0.0345	--	--
PCB 4/10	2,2'-DiCB + 2,6-DiCB	ug/Kg	0.856	0.160	0.0877	0.111 UJT	0.217	--	--
PCB 5/8	2,3-DiCB + 2,4'-DiCB	ug/Kg	1.73	0.281	0.160	0.355 T	0.450	--	--
PCB 6	2,3'-DiCB	ug/Kg	0.336	0.0678	0.0493 U	0.0709 T	0.0952	--	--
PCB 7/9	2,4-DiCB + 2,5-DiCB	ug/Kg	0.157	0.0509 U	0.0493 U	0.0554 UT	0.0491 U	--	--
PCB 11	3,3'-DiCB	ug/Kg	1.79	0.204	0.217	0.671 T	0.444	--	--
PCB 12/13	3,4-DiCB + 3,4'-DiCB	ug/Kg	0.0967 U	0.0509 U	0.0493 U	0.0554 UT	0.0491 U	--	--
PCB 14	3,5-DiCB	ug/Kg	0.0967 U	0.0509 U	0.0493 U	0.0554 UT	0.0491 U	--	--
PCB 15	4,4'-DiCB	ug/Kg	2.34	0.320	0.233	0.451 T	0.597	--	--
PCB 16/32	2,2',3'-TriCB + 2,4',6'-TriCB	ug/Kg	6.89	0.757	0.541	0.973 T	1.04	--	--
PCB 17	2,2',4'-TriCB	ug/Kg	3.57	0.362	0.242	0.406 T	0.507	--	--
PCB 18	2,2',5'-TriCB	ug/Kg	10.6	1.12	0.737	1.25 T	1.37	--	--
PCB 19	2,2',6'-TriCB	ug/Kg	1.34	0.185	0.148	0.279 T	0.221	--	--
PCB 20/21/33	2,3,3'-TriCB + 2,3,4'-TriCB + 2',3,4'-TriCB	ug/Kg	4.59	0.501	0.420	0.747 T	0.737	--	--
PCB 22	2,3,4'-TriCB	ug/Kg	3.73	0.368	0.305	0.500 T	0.543	--	--
PCB 23	2,3,5'-TriCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 24/27	2,3,6'-TriCB + 2,3',6'-TriCB	ug/Kg	0.830	0.105	0.0795	0.153 T	0.148	--	--
PCB 25	2,3',4'-TriCB	ug/Kg	0.891	0.0655	0.0603	0.0920 T	0.122	--	--
PCB 26	2,3',5'-TriCB	ug/Kg	1.61	0.161	0.128	0.224 T	0.273	--	--
PCB 28	2,4,4'-TriCB	ug/Kg	12.7	1.19	0.990	1.52 T	1.78	--	--
PCB 29	2,4,5'-TriCB	ug/Kg	0.0484 U	0.0255 U	0.00601 J	0.00787 JT	0.00873 J	--	--
PCB 30	2,4,6'-TriCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 31	2,4',5'-TriCB	ug/Kg	9.36	1.02	0.786	1.31 T	1.52	--	--
PCB 34	2',3,5'-TriCB	ug/Kg	0.0455 J	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 35	3,3',4'-TriCB	ug/Kg	0.155	0.0222 J	0.0189 J	0.0394 T	0.0341	--	--
PCB 36	3,3',5'-TriCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 37	3,4,4'-TriCB	ug/Kg	3.53	0.381	0.304	0.587 T	0.547	--	--
PCB 38	3,4,5'-TriCB	ug/Kg	0.117	0.0197 J	0.0171 J	0.0370 T	0.0222 J	--	--
PCB 39	3,4',5'-TriCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 40	2,2',3,3'-TeCB	ug/Kg	6.02	0.627	0.513	1.03 T	0.745	--	--
PCB 41/64/71/72	2,2',3,4'-TeCB + 2,3,4',6'-TeCB + 2,3',4',6'-TeCB + 2,3',5,5'-TeCB	ug/Kg	19.6	2.21	1.64	3.30 T	2.51	--	--
PCB 42/59	2,2',3,4'-TeCB + 2,3,3',6'-TeCB	ug/Kg	8.81	0.957	0.766	1.59 T	1.14	--	--
PCB 43/49	2,2',3,5'-TeCB + 2,2',4,5'-TeCB	ug/Kg	18.9	1.99	1.47	3.23 T	2.40	--	--
PCB 44	2,2',3,5'-TeCB	ug/Kg	29.9	2.91	2.24	5.02 T	3.58	--	--
PCB 45	2,2',3,6'-TeCB	ug/Kg	6.05	0.715	0.576	1.09 T	0.774	--	--
PCB 46	2,2',3,6'-TeCB	ug/Kg	2.58	0.329	0.255	0.468 T	0.352	--	--
PCB 47	2,2',4,4'-TeCB	ug/Kg	7.02	0.732	0.597	1.22 T	0.861	--	--
PCB 48/75	2,2',4,5'-TeCB + 2,4,4',6'-TeCB	ug/Kg	4.71	0.454	0.300	0.616 T	0.467	--	--
PCB 50	2,2',4,6'-TeCB	ug/Kg	0.086	0.0113 J	0.0102 J	0.0201 JT	0.0127 J	--	--
PCB 51	2,2',4,6'-TeCB	ug/Kg	1.64	0.213	0.166	0.316 T	0.226	--	--
PCB 52/69	2,2',5,5'-TeCB + 2,3',4,6'-TeCB	ug/Kg	29.8	3.18	2.42	5.27 T	3.84	--	--
PCB 53	2,2',5,6'-TeCB	ug/Kg	5.60	0.712	0.571	1.05 T	0.733	--	--
PCB 54	2,2',6,6'-TeCB	ug/Kg	0.0685	0.0104 J	0.00909 J	0.0164 JT	0.0124 J	--	--
PCB 55	2,3,3',4'-TeCB	ug/Kg	0.586	0.0365	0.0304	0.0597 T	0.0475	--	--
PCB 56/60	2,3,3',4'-TeCB + 2,3,4,4'-TeCB	ug/Kg	12.8	1.32	0.891	1.60 T	1.32	--	--
PCB 57	2,3,3',5'-TeCB	ug/Kg	0.0844	0.0107 J	0.00562 J	0.0130 JT	0.0103 J	--	--
PCB 58	2,3,3',5'-TeCB	ug/Kg	0.0484 U	0.00883 J	0.00598 J	0.0132 JT	0.00746 J	--	--
PCB 61/70	2,3,4,5'-TeCB + 2,3',4',5'-TeCB	ug/Kg	26.9	2.42	1.67	3.66 T	2.77	--	--
PCB 62	2,3,4,6'-TeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 63	2,3,4',5'-TeCB	ug/Kg	0.705	0.0669	0.0437	0.0756 T	0.0610	--	--
PCB 65	2,3,5,6'-TeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 66/76	2,3',4,4'-TeCB + 2',3,4,5'-TeCB	ug/Kg	22.5	2.01	1.44	2.98 T	2.19	--	--
PCB 67	2,3',4,5'-TeCB	ug/Kg	0.543	0.0507	0.0376	0.0613 T	0.0528	--	--

Table 4
Summary of Polychlorinated Biphenyl Congener Analytical Results
LWG Sediment Trap Solids Sample
Outfall Basin 18

IUPAC Number ⁽³⁾	Chemical Name	Units	LWG Sample ⁽¹⁾					JSCS ⁽²⁾ Screening Level Value	
			NW Yeon Trunk Line						
			Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids		
			Manhole AMZ088	Manhole AMZ088	Manhole AMZ088 Field Duplicate	Manhole AMZ088	Manhole AMZ088		
			7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008	(Toxicity)	(Bioaccumulation)
PCB 68	2,3',4,5'-TeCB	ug/Kg	0.0484 U	0.0132 J	0.0122 J	0.0201 JT	0.0128 J	--	--
PCB 73	2,3',5',6'-TeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 74	2,4,4',5'-TeCB	ug/Kg	9.56	0.893	0.566	1.03 T	0.831	--	--
PCB 77	3,3',4,4'-TeCB	ug/Kg	1.77	0.220	0.168	0.343 T	0.262	--	0.052
PCB 78	3,3',4,5'-TeCB	ug/Kg	0.0819	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 79	3,3',4,5'-TeCB	ug/Kg	0.264	0.0395	0.0340	0.0690 T	0.0462	--	--
PCB 80	3,3',5,5'-TeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 81	3,4,4',5'-TeCB	ug/Kg	0.391	0.00423 J	0.00667 J	0.0187 JT	0.0124 J	--	0.017
PCB 82	2,2',3,3',4'-PeCB	ug/Kg	6.41	0.625	0.585	1.10 T	0.808	--	--
PCB 83	2,2',3,3',5'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 84/92	2,2',3,3',6'-PeCB + 2,2',3,5,5'-PeCB	ug/Kg	13.7	1.77	1.68	3.14 T	2.22	--	--
PCB 85/116	2,2',3,4,4'-PeCB + 2,3,4,5,6'-PeCB	ug/Kg	5.39	0.789	0.767	1.39 T	0.971	--	--
PCB 86	2,2',3,4,5'-PeCB	ug/Kg	0.0484 U	0.0467	0.0359	0.0545 T	0.0411	--	--
PCB 87/117/125	2,2',3,4,5'-PeCB + 2,3,4',5,6'-PeCB + 2',3,4,5,6'-PeCB	ug/Kg	11.1	1.36	1.27	2.64 T	1.85	--	--
PCB 88/91	2,2',3,4,6'-PeCB + 2,2',3,4',6'-PeCB	ug/Kg	5.05	0.708	0.665	1.17 T	0.799	--	--
PCB 89	2,2',3,4,6'-PeCB	ug/Kg	0.907	0.0966	0.0919	0.164 T	0.131	--	--
PCB 90/101	2,2',3,4',5'-PeCB + 2,2',4,5,5'-PeCB	ug/Kg	28.3	3.47	3.19	6.50 T	4.44	--	--
PCB 93	2,2',3,5,6'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 94	2,2',3,5,6'-PeCB	ug/Kg	0.200	0.0309	0.0292	0.0471 T	0.0356	--	--
PCB 95/98/102	2,2',3,5',6'-PeCB + 2,2',3',4,6'-PeCB + 2,2',4,5,6'-PeCB	ug/Kg	25.3	3.54	3.27	6.01 T	4.06	--	--
PCB 96	2,2',3,6,6'-PeCB	ug/Kg	0.399	0.0596	0.0532	0.101 T	0.0688	--	--
PCB 97	2,2',3',4,5'-PeCB	ug/Kg	9.95	1.18	1.07	2.14 T	1.52	--	--
PCB 99	2,2',4,4',5'-PeCB	ug/Kg	13.6	1.55	1.46	2.87 T	1.97	--	--
PCB 100	2,2',4,4',6'-PeCB	ug/Kg	0.0839	0.0127 J	0.0114 J	0.0207 JT	0.0151 J	--	--
PCB 103	2,2',4,5',6'-PeCB	ug/Kg	0.164	0.0279	0.0246 J	0.0434 T	0.0302	--	--
PCB 104	2,2',4,6,6'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 105	2,3,3',4,4'-PeCB	ug/Kg	9.39	0.901	0.735	1.58 T	1.20	--	0.17
PCB 106/118	2,3,3',4,5'-PeCB + 2,3',4,4',5'-PeCB	ug/Kg	21.1	2.34	2.00	4.37 T	3.20	--	0.12
PCB 107/109	2,3,3',4',5'-PeCB + 2,3,3',4,6'-PeCB	ug/Kg	1.30	0.162	0.143	0.296 T	0.222	--	--
PCB 108/112	2,3,3',4,5'-PeCB + 2,3,3',5,6'-PeCB	ug/Kg	1.55	0.199	0.193	0.353 T	0.243	--	--
PCB 110	2,3,3',4',6'-PeCB	ug/Kg	33.8	4.52	4.34	7.88 T	5.54	--	--
PCB 111/115	2,3,3',5,5'-PeCB + 2,3,4,4',6'-PeCB	ug/Kg	0.798	0.0685	0.0550	0.122 T	0.102	--	--
PCB 113	2,3,3',5',6'-PeCB	ug/Kg	0.0484 U	0.0272	0.0249	0.0231 JT	0.0218 J	--	--
PCB 114	2,3,4,4',5'-PeCB	ug/Kg	0.521	0.0537	0.0351	0.0833 T	0.0588	--	0.17
PCB 119	2,3',4,4',6'-PeCB	ug/Kg	0.474	0.0626	0.0545	0.108 T	0.0759	--	--
PCB 120	2,3',4,5,5'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0154 JT	0.0151 J	--	--
PCB 121	2,3',4,5',6'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 122	2',3,3',4,5'-PeCB	ug/Kg	0.544	0.0525	0.0462	0.0897 T	0.0588	--	--
PCB 123	2',3,4,4',5'-PeCB	ug/Kg	0.523	0.0702	0.0622	0.124 T	0.0934	--	0.21
PCB 124	2',3,4,5,5'-PeCB	ug/Kg	1.09	0.132	0.127	0.256 T	0.187	--	--
PCB 126	3,3',4,4',5'-PeCB	ug/Kg	0.135 UJ	0.0212 J	0.0168 J	0.0376 T	0.0327	--	0.00005
PCB 127	3,3',4,5,5'-PeCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--

Table 4
Summary of Polychlorinated Biphenyl Congener Analytical Results
LWG Sediment Trap Solids Sample
Outfall Basin 18

IUPAC Number ⁽³⁾ Chemical NameUnits			LWG Sample ⁽¹⁾					JSCS ⁽²⁾ Screening Level Value (Toxicity)(Bioaccumulation)	
			NW Yeon Trunk Line						
			Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids		
			Manhole AMZ088	Manhole AMZ088	Manhole AMZ088 Field Duplicate	Manhole AMZ088	Manhole AMZ088		
			7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008		
PCB 128/162	2,2',3,3',4,4'-HxCB + 2,3,3',4',5,5'-HxCB	ug/Kg	4.00	0.504	0.503	0.925 T	0.647	--	--
PCB 129	2,2',3,3',4,5-HxCB	ug/Kg	1.13	0.154	0.166	0.298 T	0.207	--	--
PCB 130	2,2',3,3',4,5'-HxCB	ug/Kg	1.40	0.209	0.214	0.391 T	0.281	--	--
PCB 131	2,2',3,3',4,6-HxCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 132/161	2,2',3,3',4,6'-HxCB + 2,3,3',4,5',6-HxCB	ug/Kg	7.45	1.05	1.03	1.79 T	1.27	--	--
PCB 133/142	2,2',3,3',5,5'-HxCB + 2,2',3,4,5,6-HxCB	ug/Kg	0.773	0.0904	0.0891	0.169 T	0.118	--	--
PCB 134/143	2,2',3,3',5,6-HxCB + 2,2',3,4,5,6'-HxCB	ug/Kg	1.42	0.182	0.175	0.326 T	0.226	--	--
PCB 135	2,2',3,3',5,6'-HxCB	ug/Kg	3.31	0.523	0.528	0.809 T	0.591	--	--
PCB 136	2,2',3,3',6,6'-HxCB	ug/Kg	3.55	0.527	0.522	0.866 T	0.615	--	--
PCB 137	2,2',3,4,4',5-HxCB	ug/Kg	1.37	0.162	0.158	0.289 T	0.183	--	--
PCB 138/163/164	2,2',3,4,4',5'-HxCB + 2,3,3',4',5,6-HxCB + 2,3,3',4',5',6-HxCB	ug/Kg	23.5	3.61	3.63	6.30 T	4.38	--	--
PCB 139/149	2,2',3,4,4',6-HxCB + 2,2',3,4',5',6-HxCB	ug/Kg	17.8	3.40	3.32	5.25 T	3.83	--	--
PCB 140	2,2',3,4,4',6'-HxCB	ug/Kg	0.105	0.0218 J	0.0200 J	0.0351 T	0.0314	--	--
PCB 141	2,2',3,4,5,5'-HxCB	ug/Kg	6.43	0.810	0.774	1.34 T	0.925	--	--
PCB 144	2,2',3,4,5',6-HxCB	ug/Kg	1.09	0.210	0.211	0.358 T	0.260	--	--
PCB 145	2,2',3,4,6,6'-HxCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 146/165	2,2',3,4',5,5'-HxCB + 2,3,3',5,5',6-HxCB	ug/Kg	3.13	0.462	0.466	0.799 T	0.552	--	--
PCB 147	2,2',3,4',5,6-HxCB	ug/Kg	0.347	0.0644	0.0708	0.120 T	0.0904	--	--
PCB 148	2,2',3,4',5,6'-HxCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 150	2,2',3,4',6,6'-HxCB	ug/Kg	0.0202 J	0.0255 U	0.0246 U	0.0069 JT	0.0246 U	--	--
PCB 151	2,2',3,5,5',6-HxCB	ug/Kg	5.87	1.01	0.967	1.54 T	1.10	--	--
PCB 152	2,2',3,5,6,6'-HxCB	ug/Kg	0.0219 J	0.0255 U	0.0246 U	0.0277 UT	0.00559 J	--	--
PCB 153	2,2',4,4',5,5'-HxCB	ug/Kg	25.8	3.42	3.30	5.69 T	3.98	--	--
PCB 154	2,2',4,4',5,6'-HxCB	ug/Kg	0.161	0.0306	0.0274	0.0480 T	0.0374	--	--
PCB 155	2,2',4,4',6,6'-HxCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 156	2,3,3',4,4',5-HxCB	ug/Kg	2.39	0.266	0.249	0.501 T	0.358	--	0.21
PCB 157	2,3,3',4,4',5'-HxCB	ug/Kg	0.572	0.0672	0.0752	0.133 T	0.0922	--	0.21
PCB 158/160	2,3,3',4,4',6-HxCB + 2,3,3',4,5,6-HxCB	ug/Kg	3.00	0.425	0.426	0.728 T	0.523	--	--
PCB 159	2,3,3',4,5,5'-HxCB	ug/Kg	0.228	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 166	2,3,4,4',5,6-HxCB	ug/Kg	0.130	0.0116 J	0.0138	0.0241 JT	0.0169 J	--	--
PCB 167	2,3,4,4',5,5'-HxCB	ug/Kg	1.03	0.132	0.137	0.242 T	0.175	--	0.21
PCB 168	2,3,4,4',5',6-HxCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 169	3,3',4,4',5,5'-HxCB	ug/Kg	0.0825 UJ	0.00659 U	0.00505 U	0.00738 UT	0.00509 U	--	0.00021
PCB 170	2,2',3,3',4,4',5-HpCB	ug/Kg	7.53	1.06	1.04	1.62 T	1.19	--	--
PCB 171	2,2',3,3',4,4',6-HpCB	ug/Kg	2.00	0.285	0.284	0.440 T	0.319	--	--
PCB 172	2,2',3,3',4,5,5'-HpCB	ug/Kg	1.25	0.189	0.177	0.297 T	0.214	--	--
PCB 173	2,2',3,3',4,5,6-HpCB	ug/Kg	0.208	0.0294	0.0292	0.0439 T	0.0335	--	--
PCB 174	2,2',3,3',4,5,6'-HpCB	ug/Kg	9.29	1.28	1.26	2.01 T	1.52	--	--
PCB 175	2,2',3,3',4,5',6-HpCB	ug/Kg	0.0484 U	0.0614	0.0631	0.0897 T	0.0722	--	--
PCB 176	2,2',3,3',4,6,6'-HpCB	ug/Kg	1.12	0.171	0.164	0.255 T	0.198	--	--
PCB 177	2,2',3,3',4',5,6-HpCB	ug/Kg	5.24	0.673	0.677	1.07 T	0.786	--	--
PCB 178	2,2',3,3',5,5',6-HpCB	ug/Kg	1.67	0.253	0.252	0.408 T	0.312	--	--
PCB 179	2,2',3,3',5,6,6'-HpCB	ug/Kg	4.03	0.582	0.550	0.876 T	0.680	--	--
PCB 180	2,2',3,4,4',5,5'-HpCB	ug/Kg	19.9	2.70	2.69	4.42 T	3.46	--	--
PCB 181	2,2',3,4,4',5,6-HpCB	ug/Kg	0.0484 U	0.0116 J	0.0139 J	0.0239 JT	0.0135 J	--	--
PCB 182/187	2,2',3,4,4',5,6'-HpCB + 2,2',3,4',5,5',6-HpCB	ug/Kg	11.4	1.65	1.59	2.73 T	2.27	--	--
PCB 183	2,2',3,4,4',5',6-HpCB	ug/Kg	5.09	0.727	0.703	1.13 T	0.867	--	--
PCB 184	2,2',3,4,4',6,6'-HpCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 185	2,2',3,4,5,5',6-HpCB	ug/Kg	1.07	0.145	0.146	0.240 T	0.186	--	--
PCB 186	2,2',3,4,5,6,6'-HpCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 188	2,2',3,4',5,6,6'-HpCB	ug/Kg	0.0109 J	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 189	2,3,3',4,4',5,5'-HpCB	ug/Kg	0.277	0.0369	0.0411	0.0617 T	0.0489	--	1.2
PCB 190	2,3,3',4,4',5,6-HpCB	ug/Kg	1.53	0.253	0.236	0.379 T	0.267	--	--
PCB 191	2,3,3',4,4',5',6-HpCB	ug/Kg	0.296	0.0460	0.0436	0.0756 T	0.0555	--	--
PCB 192	2,3,3',4,5,5',6-HpCB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 193	2,3,3',4',5,5',6-HpCB	ug/Kg	0.860	0.126	0.122	0.214 T	0.152	--	--

Table 4
Summary of Polychlorinated Biphenyl Congener Analytical Results
LWG Sediment Trap Solids Sample
Outfall Basin 18

			LWG Sample ⁽¹⁾					JSCS ⁽²⁾ Screening Level Value	
			NW Yeon Trunk Line						
			Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids	Sediment Trap Solids		
IUPAC Number ⁽³⁾	Chemical Name	Units	Manhole AMZ088	Manhole AMZ088	Manhole AMZ088 Field Duplicate	Manhole AMZ088	Manhole AMZ088	(Toxicity)	(Bioaccumulation)
			7/2/2007	12/20/2007	12/20/2007	1/31/2008	2/1/2008		
PCB 194	2,2',3,3',4,4',5,5'-O ₂ CB	ug/Kg	5.59	0.588	0.583	1.21 T	1.29	--	--
PCB 195	2,2',3,3',4,4',5,6-O ₂ CB	ug/Kg	2.19	0.232	0.233	0.429 T	0.324	--	--
PCB 196/203	2,2',3,3',4,4',5,6'-O ₂ CB + 2,2',3,4,4',5,5',6-O ₂ CB	ug/Kg	6.13	0.868	0.832	1.95 T	2.22	--	--
PCB 197	2,2',3,3',4,4',6,6'-O ₂ CB	ug/Kg	0.184	0.0258	0.0240 J	0.0441 T	0.0382	--	--
PCB 198	2,2',3,3',4,5,5',6-O ₂ CB	ug/Kg	0.466	0.0432	0.0309	0.0538 T	0.0621	--	--
PCB 199	2,2',3,3',4,5,5',6'-O ₂ CB	ug/Kg	6.68	0.810	0.809	1.99 T	2.35	--	--
PCB 200	2,2',3,3',4,5,6,6'-O ₂ CB	ug/Kg	0.750	0.105	0.101	0.208 T	0.217	--	--
PCB 201	2,2',3,3',4,5',6,6'-O ₂ CB	ug/Kg	0.877	0.0915	0.0881	0.200 T	0.211	--	--
PCB 202	2,2',3,3',5,5',6,6'-O ₂ CB	ug/Kg	1.41	0.148	0.158	0.376 T	0.459	--	--
PCB 204	2,2',3,4,4',5,6,6'-O ₂ CB	ug/Kg	0.0484 U	0.0255 U	0.0246 U	0.0277 UT	0.0246 U	--	--
PCB 205	2,3,3',4,4',5,5',6-O ₂ CB	ug/Kg	0.161	0.0300	0.0296	0.0531 T	0.0388	--	--
PCB 206	2,2',3,3',4,4',5,5',6-NoCB	ug/Kg	4.23	0.292	0.272	1.15 T	1.88	--	--
PCB 207	2,2',3,3',4,4',5,6,6'-NoCB	ug/Kg	0.452	0.0407	0.0387	0.122 T	0.205	--	--
PCB 208	2,2',3,3',4,5,5',6,6'-NoCB	ug/Kg	1.06	0.0765	0.0805	0.287 T	0.462	--	--
PCB 209	Decachlorobiphenyl	ug/Kg	0.832	0.0800	0.0602	0.223 T	0.284	--	--
	Total Monochlorobiphenyls	ug/Kg	0.468	0.798	0.0634	0.101	0.0755	--	--
	Total Dichlorobiphenyls	ug/Kg	7.21	1.03	0.698	1.66	1.80	--	--
	Total Trichlorobiphenyls	ug/Kg	59.8	6.26	4.78	8.13	8.87	--	--
	Total Tetrachlorobiphenyls	ug/Kg	217	22.1	16.4	34.2	25.3	--	--
	Total Pentachlorobiphenyls	ug/Kg	192	23.9	22.0	42.7	30.0	--	--
	Total Hexachlorobiphenyls	ug/Kg	116	17.3	17.1	29.0	20.5	--	--
	Total Heptachlorobiphenyls	ug/Kg	72.8	10.3	10.1	16.4	12.6	--	--
	Total Octachlorobiphenyls	ug/Kg	24.4	2.94	2.89	6.51	7.21	--	--
	Total Nonachlorobiphenyls	ug/Kg	5.74	0.409	0.391	1.56	2.55	--	--
	Total Decachlorobiphenyls	ug/Kg	0.832	0.0800	0.0602	0.223	0.284	--	--
	Total PCBs	ug/Kg	696 J	85.2 J	74.5 J	140 J	109 J	676	0.39

Notes:

MoCB = Monochlorobiphenyl

DiCB = Dichlorobiphenyl

TriCB = Trichlorobiphenyl

TeCB = Tetrachlorobiphenyl

PeCB = Pentachlorobiphenyl

HeCB = Hexachlorobiphenyl

HpCB = Heptachlorobiphenyl

OcCB = Octachlorobiphenyl

NoCB = Nonachlorobiphenyl


J = Estimated Result

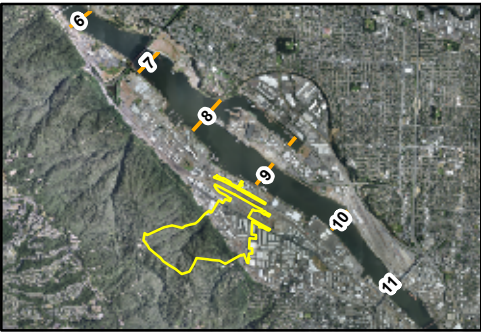
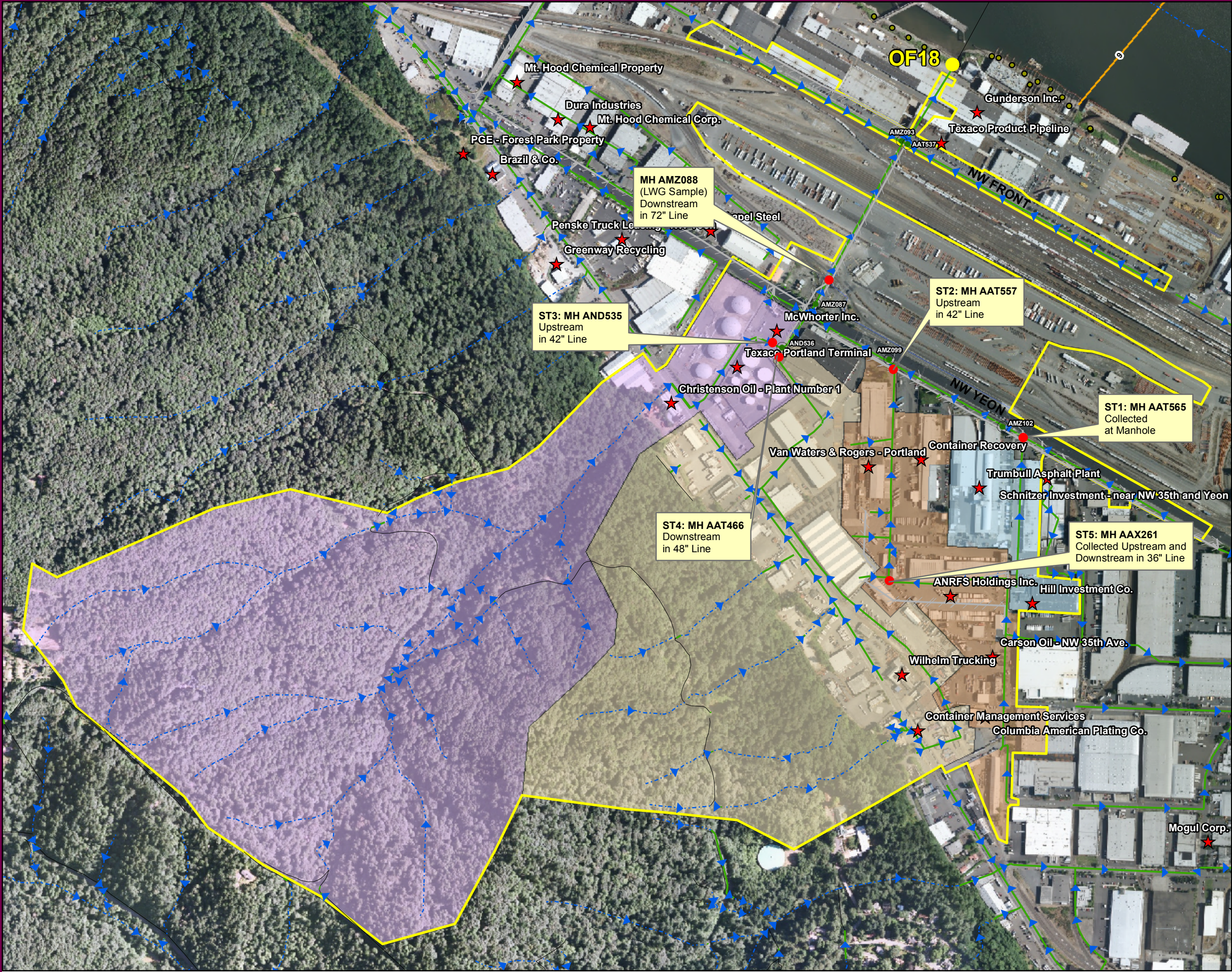
T = Value is an average or selected result (see data rules).

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

-- No JSCS screening level available.

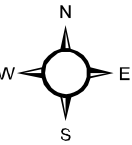
ug/Kg = Micrograms per kilogram.

⁽¹⁾Refer to Anchor and Integral, 2007, 2008a, and 2008b.⁽²⁾JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007).⁽³⁾IUPAC - International Union of Pure and Applied Chemistry**bold** = concentration exceeds JSCS Bioaccumulation Screening Level Value = concentration exceeds JSCS Toxicity Screening Level Value




- Legend**
- Basin 18 Boundary
 - Western Subbasin
 - West-Central Subbasin
 - East-Central Subbasin
 - Eastern Subbasin
 - River Miles
 - Abandoned Storm Line
 - Storm Line
 - City Outfall
 - Non-City Outfall
 - Manhole
 - DEQ ECSI Site
 - Sample Location

0 250 500 1,000 Feet



Information contained on this map is accurate according to available records, however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

Figure 1
Outfall 18
Drainage Basin Overview

Source: City of Portland BES Aerial Photo 2009	 ENVIRONMENTAL SERVICES CITY OF PORTLAND 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\Corey Maps\OF 18	Program Manager: Linda Scheffler Portland Harbor Superfund
Sheet No. 1 of 1	Prepared By Corey Treacy Date Printed 07/20/10



- Legend**
- Basin 18 Boundary
 - Western Subbasin
 - West-Central Subbasin
 - East-Central Subbasin
 - Eastern Subbasin
 - Taxlots
 - River Miles
 - Abandoned Storm Line
 - Storm Line
 - DEQ ECSI Site
 - Manhole
 - Catch Basin
 - Sample Location
 - MH# Sediment Trap Solids
 - MH# Inline Solids Grab

Notes:
Results are shown in ug/Kg. Qualifiers defined in Table 3 - Summary of Chemical Analytical Results
ND = Not detected.
NA = Not analyzed.

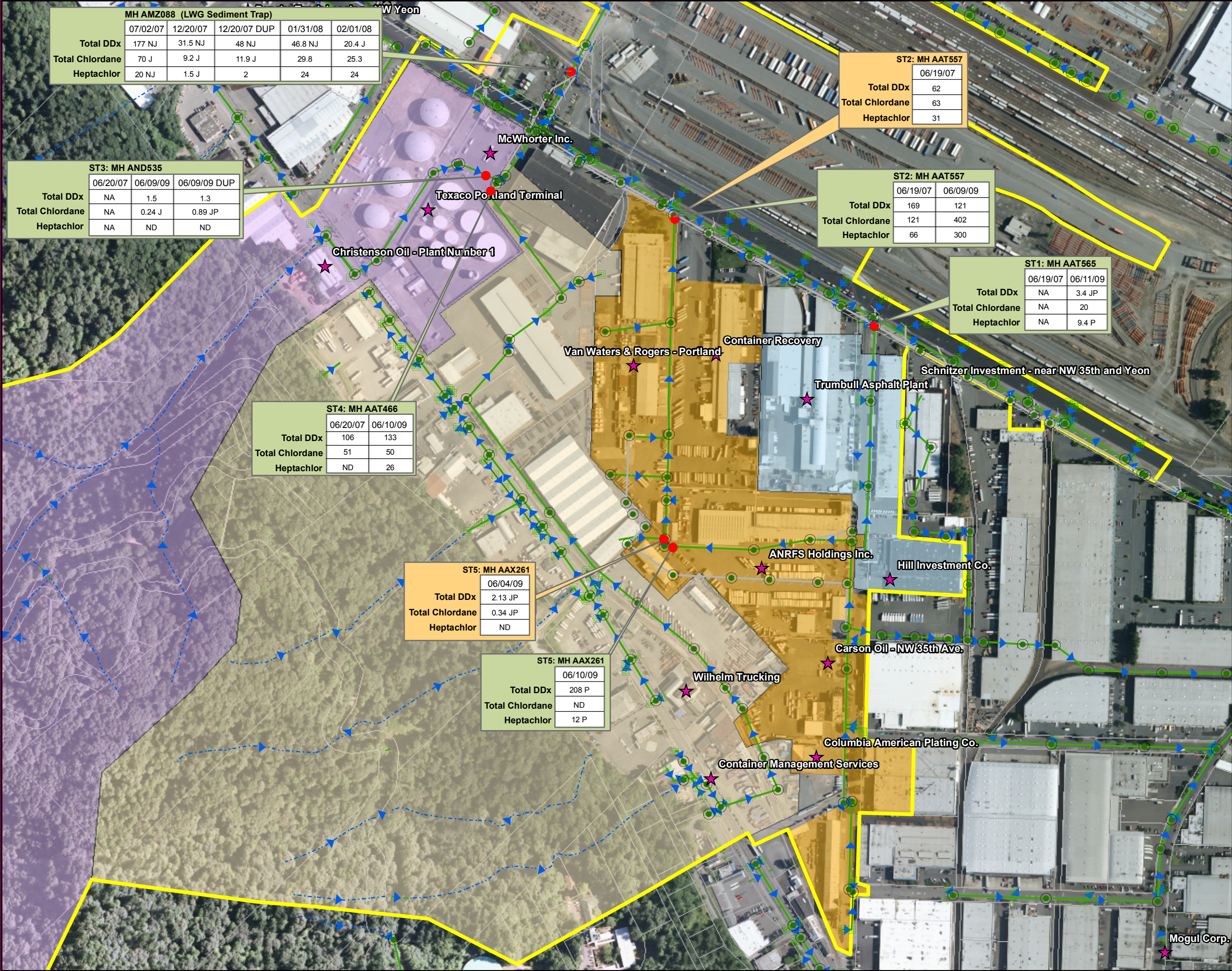
0 200 400 800 Feet

Information contained on this map is accurate according to available records, however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

N
E
S

Figure 2
Basin 18 Inline Solids
Total PCBs

Source: City of Portland BES Aerial Photo 2009	ENVIRONMENTAL SERVICES CITY OF PORTLAND 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\Corey Maps\OF 18	Program Manager: Linda Scheffler Portland Harbor Superfund
Sheet No. 1 of 1	Prepared by: Corey Treacy Date Printed: 07/20/10



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 - Sample Location
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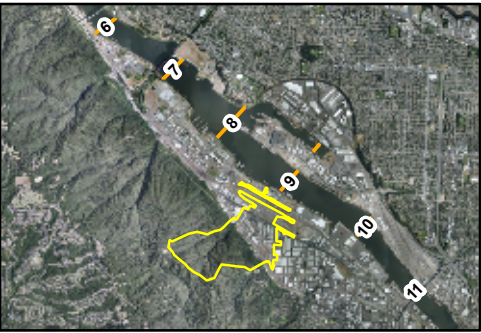
Notes:
Results are shown in ug/Kg. Qualifiers defined in Table 3 - Summary of Chemical Analytical Results
ND = Not detected.
NA = Not analyzed.

0 200 400 800 Feet

Information contained on this map is accurate according to available records, however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

Figure 3
Basin 18 Inline Solids
Pesticides
(Total DDx, Total Chlordane, and Heptachlor)

Source: City of Portland BES Aerial Photo 2009	ENVIRONMENTAL SERVICES CITY OF PORTLAND 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204 -1912
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- Legend**
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 - Catch Basin
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 - MH# Sediment Trap Solids
 - MH# Inline Solids Grab

Notes:
Results are shown in mg/Kg. Qualifiers defined in Table 3 - Summary of Chemical Analytical Results
ND = Not detected.
NA = Not analyzed.



Information contained on this map is accurate according to available records, however, the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

Figure 4
Basin 18 Inline Solids Metals
(Cd, Cr, Cu, Pb, and Zn)

Source: City of Portland BES Aerial Photo 2009	ENVIRONMENTAL SERVICES CITY OF PORTLAND 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204 - 1912
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Sheet No. 1 of 1	Prepared by: Corey Treacy Date Printed: 07/20/10

Attachment A
2009 Inline Sediment Trap
Basin 18 R&D Pilot Study



City of Portland Outfall Project Winter 2009 Inline Sediment Trap Pilot Study Summary Report

TO: Linda Scheffler, Bureau of Environmental Services (BES)
FROM: Jeremiah Bawden, BES
COPIES: Randy Belston, BES
Peter Abrams, BES
DATE: July 20, 2010
SUBJECT: **Portland Harbor – Inline Sediment Trap Basin 18 R&D Pilot Study**

Objectives

Inline sediment traps were redeployed during the fall and winter of Fiscal Year 2008-09 (FY 08/09) in Basin 18 to address the source investigation data gaps that resulted from the limited sample volumes recovered during the City's initial 2007 sediment trap deployment. The objectives of the City's continued source investigations in Basin 18 were to both identify potential source areas for contaminants detected at elevated concentrations in the Lower Willamette Group (LWG) sediment traps from the 2007 deployment, and to conduct a pilot study of different trap designs and bottle shapes to evaluate stormwater solids capture rates.

This technical memorandum summarizes the results of the sediment trap equipment pilot study. Three primary objectives were identified by BES Field Operations (FO) for assessment during this pilot work in Basin 18:

1. Compare volume capture rates from the FY 08/09 deployments to volume capture rates at the same sampling locations in FY 06/07 to conduct a temporal evaluation of sediment trap performance.
2. Compare volume capture rates for different bottle types deployed at each station to evaluate whether one bottle type outperformed the others during the study period.
3. Design and implement a new style of sediment trap and evaluate trap performance.

Background

Inline sediment traps are one of many sampling tools utilized by the City of Portland Outfall Project for investigating contaminant sources to the City stormwater conveyance system. The BES Portland Harbor Group tasked FO to install sediment traps in a variety of locations within the stormwater conveyance system during the 2007-08 and 2008-09 wet seasons in support of these efforts. In 2007 the LWG installed sediment traps in a number of stormwater conveyance systems discharging to Portland Harbor, including locations in the City stormwater conveyance system. To assist with interpreting data collected by the LWG from City systems, FO was requested to follow the LWG standard operating procedure (SOP) and to install

additional sediment traps further upstream in selected outfall basins. Since then, FO has developed an SOP (*SOP 5.01b – Sampling Stormwater Solids Using Inline Sediment Traps*) for stormwater solids sample collection with inline sediment traps, and has deployed sediment traps in a number of locations to support outfall basin source investigation efforts.

The standard sediment trap design consists of a stainless steel bracket and cylinder that houses a 1-liter (L), high-density polyethylene (HDPE) sample bottle. The trap itself is mounted in-situ to the bottom of a pipe, or to the wall of a manhole vault, via stainless steel concrete anchor bolts. The installed trap bottle height, with the bracket in place, is ~9.5 inches (in.), which can impede capture of smaller storm flows and makes installation in small pipe diameters impracticable.

The majority of the inline sediment trap deployments to date have captured insufficient volumes of stormwater solids to meet all analytical objectives for this project, so a pilot study was conducted by FO in Basin 18 in 2009 to evaluate how variables such as trap design, bottle shape, and bottle aperture affect captured stormwater solids volumes (*City of Portland Outfalls Project Winter 2009 Inline Sediment Trap Pilot Study Sampling and Analysis Plan*). This summary report will only discuss the results of this pilot study, which lasted from October 2008 until June 2009.

Basin 18 Pilot Study

Alternate sediment trap designs and different bottle types that were tested during this study included:

- 1 standard 1-L HDPE round, narrow-mouth bottle (bottle type used for current standard sediment trap design)
 - Inside diameter (ID) neck aperture: 27 millimeters (mm)/1.0625 in.
 - Bottle height with polypropylene screw closure: 216 mm/8.5 in.
 - Outside diameter (OD) of bottle: 91 mm/3.625 in.
- 1 standard 1-L HDPE round, wide-mouth bottle
 - ID neck aperture: 53 mm/2.0625 in.
 - Bottle height with polypropylene screw closure: 199 mm/7.875 in.
 - OD of bottle: 91 mm/3.625 in.
- 1 low-profile rectangular 1-L HDPE, wide-mouth bottle
 - ID neck aperture: 44 mm/1.75 in.
 - Bottle dimensions (H x W x D): 180 mm/7 in. x 125 mm/5 in. x 71mm/2.75 in.
- 1 low-profile square 1-L HDPE, wide-mouth bottle
 - ID neck aperture: 53mm/2.0625 in.
 - Bottle dimensions (H x W x D): 181 mm/7 in. x 95mm/3.5 in. x 95 mm/3.5 in.

Additionally, an alternative sediment trap prototype, designed by FO, was also tested and evaluated in conjunction with these different trap designs and bottles during this study (see Photo 1). The Screened Inline Flow-through (SIFT) sediment trap prototype consists of two bracketed, stainless steel cylinders. The upstream, primary chamber had an attached 1.5-in.-high stainless weir, and a stamped, 18-gauge stainless steel mesh back plate [~1270 micrometers (µm) – medium sands]. The downstream, secondary chamber had a stainless, fine mesh screen (~228 µm – fine sands/silts) which was backed by a stamped 18-gauge stainless steel mesh back plate.

Basin 18 Sampling Locations

FO installed a selection of standard and alternative sediment trap designs at four locations and the SIFT prototype at one location in the Basin 18 stormwater conveyance system. The sample locations are described below and shown on the attached Figure 1.

18_ST1 - Manhole AAT565: SIFT sediment trap prototype was installed upstream of the manhole and catch basin laterals in 12-inch diameter main inlet pipe.



Photo 1: SIFT sediment trap prototype in-situ at location 18_ST1.

18_ST2 - Manhole AAT557: one standard, narrow-mouth trap (NM), along with three alternate trap designs were installed upstream of the manhole in the 42-in diameter main inlet pipe: standard wide-mouth (WM); rectangular wide-mouth (RECT); square wide-mouth (SQ).

18_ST3 - Manhole AND535: one NM trap, along with three alternate traps (WM, RECT, and SQ) were installed upstream of the manhole in the 42-in diameter main inlet pipe.

18_ST4 - Manhole AAT466: one NM trap, along with three alternate traps (WM, RECT, and SQ) were installed downstream of the manhole in the 48-in diameter main outlet pipe.

18_ST5¹ - Manhole AAX261: one NM trap, along with three alternate traps (WM, RECT, and SQ) were installed upstream of the manhole in the 36-in diameter main inlet pipe.

¹ This location was not sampled during the 2007 Basin 18 sediment trap deployments.

Standard inline sediment traps were installed at all of the sites except for 18_ST5 during the initial 2007 Basin 18 sediment trap deployments. When stormwater pipe diameters allow, FO makes it a standard practice to install a pair of standard sediment traps side-by-side in an attempt to capture the greatest volume of stormwater solids to meet all analytical objectives.

During this 2009 pilot study, FO field crews installed sediment trap pairs (standard and/or alternative design traps) at or as close as possible to the original 2007 trap locations. Extending upstream from these sediment trap pairs, two more traps (standard or alternative design traps) were then installed in the collection system to be tested and evaluated concurrently with the paired traps. Photo 2 depicts the typical pilot study inline sediment trap arrangement.



Photo 2: Trap orientation at location 18_ST2; the trap at the top of the photo is the furthest upstream.

Field Activities

Alternative sediment traps and bottle types were installed in the Basin 18 stormwater conveyance system between October 30, 2008 and February 4, 2009. Periodic field visits were conducted in accordance with FO *SOP 5.01b* to ensure that traps were intact and to clear debris from trap openings, to evaluate trap performance, and to archive accumulated sediments as needed.

At location ST1, FO conducted more frequent field visits to collect captured stormwater solids from the SIFT sediment trap chambers to minimize captured solids loss during subsequent storm events. Solids were removed from the SIFT chamber with stainless steel spatulas that were decontaminated according to FO *SOP 7.01a – Decontamination of Sampling Equipment*. All removed solids from the SIFT were placed into an amber sediment jar, archived and stored in a laboratory fridge at the Water Pollution Control Laboratory (WPCL) throughout the deployment period.

All four sediment trap bottles at location ST3 were removed from the sediment traps on January 14, 2009 and archived, due to large volumes of captured stormwater solids in the trap bottles and to prevent resuspension and loss of captured solids through scouring. New bottles were installed at ST3 for the remainder of the deployment period in Basin 18.

At the conclusion of the deployment period (June 4, 2009), all trap solids were removed and processed for analyses. Solids from locations ST2 through ST5 were filtered per the SOP. Solids from ST1 were thoroughly homogenized in the archived jar using a decontaminated stainless steel spatula at the WPCL field lab at the completion of the deployment period and submitted for analyses.

Results

Table 1 summarizes the deployment periods for both the 2007 and 2008-09 wet seasons, the total rainfall during these two periods, and the total volume of stormwater solids captured at each of the locations in Basin 18 during these consecutive deployments. Table 2 summarizes the performance of the different sediment trap bottles tested during this study. This section presents an evaluation of how results support the three primary objectives of this study.

Comparison of 2007 and 2009 Trapped Sediment Volumes

The volumes of captured solids from the 2009 deployment were significantly greater than the volumes captured at the same sampling locations from 2007². This dissimilarity in captured volumes can be attributed to several factors.

First, multiple bottle sets were deployed at ST2-ST4 during this study, compared to just two-standard sediment traps being deployed in 2007 at each location. In addition, the 2009 sediment traps were installed and maintained for a longer deployment period and were subjected to greater total rainfall (and storm flow). The average number of total days of deployment in 2009 (ST2-ST4) was 173 days, compared to approximately 96 days in 2007. Similarly, the total rainfall in inches during the 2009 deployment was two to four times greater than that measured in 2007 (see Table1).

Lastly, seasonality may have affected capture volumes. During this study, the deployment duration encompassed the more intense fall and winter storm periods, which typically have a higher frequency of storm events with longer durations of active precipitation. The 2007 deployment period encompassed only the intense and flashy spring storm period, which at times can have a high frequency of storm events with shorter durations of measurable precipitation.

Comparison of Trapped Sediment Volumes by Bottle Type

Throughout the duration of this study, field crews observed variable stormwater solids capture rates per trap at all four sites.³ Initially, this was thought to be a correlation between bottle aperture and/or bottle shape or an indication that the sediment trap alignments may have altered the flow regimes at each of the sites. Based on both field observations and an analysis of the solids accumulation data in Table 2, there appeared to be a spatial component to these solids capture rates (i.e., bottle order in relation to flow may have influenced solids accumulation).

² Solids capture data for site ST5 in Table 1, which was not originally a location in 2007, has been omitted from this comparison.

³ Field notes documenting observations of solids accumulation during the deployment period are included in Attachment C of *Outfall Basin 18 Inline Solids Investigation, Technical Memorandum No. OF 18-2*, Prepared by the City of Portland Bureau of Environmental Services. July 20, 2010.

This spatial pattern primarily consisted of the furthest upstream and furthest downstream traps exhibiting the greatest solids accumulation at sites ST2, ST3, and ST4. However, this spatial pattern was not observed at sites ST5 and ST3 (after the different bottle types were subsequently archived on 1/14/2009). Due to the limited size of this study, additional data would be needed in order to determine whether a spatial pattern does indeed exist.

The data listed in Table 2 also illustrate the variability in the different bottle shapes and/or apertures attributed to the greatest and the second greatest total solids accumulations. This may reflect the combination of uncontrolled variables during this study (e.g., differences in catchment areas, land use, pipe slope, pipe size and orientation, and flow regimes). For example, the furthest downstream trap at location ST2, which was a standard, narrow-mouth bottle, captured the greatest volume of solids. The furthest upstream trap at location ST2, which was a low-profile, rectangular wide-mouth bottle, captured the second greatest volume of solids. In contrast, at location ST5, the two furthest upstream traps, which were deployed with low-profile, square wide-mouth and rectangular wide-mouth bottles, captured the most solids at this location.

The variability in the bottle types and/or aperture that captured the most solids during this study, and the small study size, do not allow for a conclusive decision to be made at this time as to which bottle type is preferred to maximize solids capture for future deployment. Nonetheless, the standard narrow-mouth bottles and rectangular wide-mouth bottles combined collected an average of 80% of the total solids captured at each location, indicating that these two bottle types may be more likely to trap solids than the other two bottle types evaluated during this study.

Evaluation of New Flow-through Trap Design

The performance of the SIFT sediment trap prototype during this study shows some promise for future applications. Table 1 summarizes the captured stormwater solids data at location ST1 for this prototype and the previous standard sediment trap deployment in 2007. The SIFT captured 41.5 g; in 2007, two standard sediment traps, both equipped with standard narrow-mouth bottles, captured a total of 10.8 g. Approximately four times more stormwater solids were captured by the SIFT sediment trap prototype compared to the solids captured by the two standard inline sediment trap bottles.

The deployment period for the SIFT began in February as opposed to March; the former typically constitutes a wetter portion of the overall storm season. For example, during this study there was approximately 11.01-in of total rainfall that occurred throughout the deployment of the SIFT prototype, compared to approximately 5.83-in of total measurable rainfall in 2007. Another factor influencing the capture rate of the SIFT prototype is in the trap's design itself. The low flow-through profile of the SIFT increases the likelihood that the trap will capture solids during a wider range of storm events, especially during smaller storms. In contrast, the standard sediment trap opening is at a height of ~9.5-in and will only sample suspended solids during storm flows that crest over the top of the bottle. Spring rain events tend to taper down in size as the wet season ends, so the SIFT likely captured more low-flow events than the standard traps.

There appear to be several advantages to using the SIFT prototype over the standard inline sediment trap for certain applications. One of these advantages is that the SIFT prototype was confirmed to capture a measurable portion of the stormwater solids fraction from a discrete smaller storm event, potentially resulting in an integrated solids sample over the duration of a wet season. This was confirmed after FO removed and archived captured solids from the prototype during an interim visit on the morning of May 18, 2009, before a subsequent storm event in which ~1.3 g of new solids were captured by the SIFT prototype during an approximate 0.36-in storm event [Yeon Raingage 121 (5/18/09-5/19/09)]. This is noteworthy because it is currently unclear how standard sediment traps perform (e.g., whether the trapped solids represent just larger storm events or an integrated sample from a range of flow conditions). The low-

profile trap design allows for trap installation in smaller lines and the use of both cotter pins and scissor-jack bands allow the prototype to be easily installed and maintained in multiple pipe diameters.

Disadvantages to the new trap design may include loss of finer solids fractions from scouring during successive storm events. Sufficient solids volume was not available during the pilot of the new design to analyze grain size, but further evaluation of the solids trapped by this design would help to determine whether the trap design introduces analytical bias (e.g., contaminants associated with finer fraction may be underrepresented by sample collected from this trap) and to define applications for future use. Also, the percent solids result for the SIFT prototype was only 39.2%, compared to the standard sediment trap percent solids result from 2007 of 54.7% at this location (sample was filtered and homogenized). If the percent solids results for SIFT samples are consistently lower than sediment trap solid, more sample volumes may be needed from SIFTs than from standard trap to meet analytical goals.

Conclusions and Recommendations

Based on the results of this pilot study, FO recommends the actions described below for future sediment trap investigations and additional evaluation of trap design and performance.

1. Perform no further testing of the different apertures and bottle types evaluated under this study.

Rationale: There was neither a definitive bottle type, nor an alternate sediment trap design, that clearly out-performed all of the other traps or bottles tested. A number of variables, such as the small sample size, the limited deployment (only one storm season), and the effects of flow variables discussed in the previous section limit the conclusivity of this study. Much more analysis, in which variables are isolated and controlled, would be needed to state definitively whether one bottle type performs consistently better than the others. While time and budget do not allow for comprehensive studies, the pilot study did determine that the standard bottle design (narrow-mouth, 1-liter HDPE) and the low-profile rectangular wide-mouth (1-liter HDPE) bottles accounted for an average of 80% of the solids volumes captured at each location. The majority of available equipment is designed to hold a standard narrow-mouth bottle. Future standard trap applications will rely on the narrow-mouth and low-profile rectangular bottles.

2. Where possible, employ the standard inline sediment trap design for pipe diameters greater than 30 inches and the SIFT design for pipe diameters less than 30 inches.

Rationale: The standard trap design is difficult to install in small pipe diameters and that FO currently has a multitude of these traps in long-term storage, which would allow for a rapid deployment into multiple basins, while also reducing additional costs associated with future research and development of new sediment trap designs. However, if time and cost are an issue, SIFTs should be considered as they do not require labor-intensive sample processing and filtration.

3. Use same trap design when conducting contaminant concentration comparisons within or between basins.

Rationale: The analytical comparability of solids trapped by SIFT vs. solids trapped by standard traps is not known; using one trap design for a specific investigation would allow for greater comparability between trap locations.

4. Conduct further testing and evaluation on the performance of the SIFT sediment trap prototype.

Rationale: More information is needed to support future installation of trap(s) in small and large-diameter stormwater pipes. The flexibility of the SIFT trap to be installed in different diameters, the ability to capture low-flow storm events, the ease of installation and removal, and the reduction in sample processing times as witnessed during this study, represent clear advantages over the standard

sediment trap. Further evaluation of potential analytical biases associated with this trap versus the standard trap is needed to refine future applications.

5. Continue to research and identify alternative sediment trap designs, which are being evaluated by other municipalities.

Rationale: This action would allow for the most promising alternative trap designs to be tested and evaluated for future use on this and other BES projects.

Tables

Table 1 – Basin 18 Sediment Trap Deployment Summary (2007-2009)

Table 1 – Basin 18 Sediment Trap Performance Summary (2008-2009)

Figure

Figure 1 – Basin 18 Inline Sediment Trap Pilot Study Locations



Table 1: Basin 18 Sediment Trap Deployment Summary (2007-2009)

2007 Sediment Traps

Sample Pt Code	Location	Hansen ID	Pipe Size (in.)	Sample ID	Installation Date	Removal Date	Laboratory Submittal Date	Rainfall During Deployment (in.)	Days Deployed	# of Bottles Deployed	Volume of Sediment Collected (g)
18_ST1	4927 NW Front Ave	AAT565	12	FO070805	3/14/2007	6/18/2007	6/21/2007	5.83	96	2	10.8
18_ST2	3950 NW Yeon Ave	AAT557	42	FO070806	3/15/2007	6/18/2007	6/21/2007	5.83	95	2	44.5
18_ST3	4033 NW Yeon Ave - 42 in. Line	AND535	42	FO070808	3/14/2007	6/19/2007	6/21/2007	5.83	97	2	15.8
18_ST4	4033 NW Yeon Ave - 48 in. line	AAT466	48	FO070809	3/14/2007	6/19/2007	6/21/2007	5.83	97	2	73.1

2008-09 Sediment Traps

Sample Pt Code	Location	Hansen ID	Pipe Size (in.)	Sample ID	Installation Date	Removal Date	Laboratory Submittal Date	Rainfall During	Days Deployed	Volume of Sediment Collected (g)	
								Deployment (in.)			
18_ST1	4927 NW Front Ave	AAT565	12	FO095692	2/4/2009	6/4/2009	6/11/2009	11.01	120	1 SIFT	43.1
18_ST2	3950 NW Yeon Ave	AAT557	42	FO095693	10/30/2008	6/4/2009	6/11/2009	26.86	217	4	223.3
18_ST3	4033 NW Yeon Ave - 42 in. Line	AND535	42	FO095694	12/9/2008	6/4/2009	6/11/2009	20.31	177	4	4152.7
18_ST4	4033 NW Yeon Ave - 48 in. line	AAT466	48	FO095695	12/9/2008	6/4/2009	6/11/2009	20.31	177	4	492.1
18_ST5	3250 NW St Helens Rd - 36 in. line	AAX261	36	FO095696	12/4/2008	6/4/2009	6/11/2009	20.44	182	4	163.4



Table 2: Basin 18 Sediment Trap Performance Summary (2008-2009)

Sediment Trap Code	Rainfall During Deployment (in.)	Days Deployed	Volume of Sediment Collected (g)
Primary Cylinder (SIFT)	11.01	120	23.7
Secondary Cylinder (SIFT)	11.01	120	19.4
18_ST2_RECT	26.86	217	73.1
18_ST2_SQ	26.86	217	18.8
18_ST2_WM	26.86	217	9
18_ST2_NM	26.86	217	122.4
18_ST3_SQ	8.91	36	280.1
18_ST3_RECT	8.91	36	365.1
18_ST3_WM	8.91	36	141.5
18_ST3_NM	8.91	36	61.5
18_ST3_SQ	11.4	141	931
18_ST3_RECT	11.4	141	542.2
18_ST3_WM	11.4	141	692.7
18_ST3_NM	11.4	141	1138.6
18_ST4_RECT	20.31	177	360.3
18_ST4_WM	20.31	177	15.3
18_ST4_SQ	20.31	177	3.5
18_ST4_NM	20.31	177	113
18_ST5_RECT	20.44	182	113.6
18_ST5_SQ	20.44	182	24.6
18_ST5_WM	20.44	182	1.4
18_ST5_NM	20.44	182	23.8

Greatest Stormwater Solids Accumulation

Sediment Trap Codes: NM = standard [1-liter (L)] HDPE round, narrow-mouth bottle (bottle type used for current sediment trap design); WM = standard (1-L) HDPE round, wide-mouth bottle; SQ = low-profile, square (1-L) HDPE, wide-mouth bottle; RECT = low-profile, rectangular (1-L) HDPE, wide-mouth bottle.

Sediment trap orientations are listed in an ascending order from furthest upstream to furthest downstream at a given node location within the stormwater conveyance system.

Attachment B
Field Photographs

2007 Sediment Trap Deployments



Photo 1 (March 2007). Western Subbasin sampling location ("ST3", Manhole AND535).



Photo 2 (June 2007). Installed sediment traps at sampling location ST3.



Photo 3 (March 2007). West-Central Subbasin sampling location ("ST4", Manhole AAT466).



Photo 4 (June 2007). Installed sediment traps at sampling location ST4.



Photo 5 (March 2007). East-Central Subbasin sampling location ("ST2", Manhole AAT557).



Photo 6 (June 2007). Installed sediment traps at sampling location ST2.



Photo 7 (March 2007). Eastern Subbasin sampling location ("ST1", Manhole AAT565).



Photo 8 (June 2007). Installed sediment traps at sampling location ST1.

2008-09 Sediment Trap Deployments



Photo 9 (December 2008). Western Subbasin sampling location ST3 (Manhole AND535) and installed sediment traps. The trap in the foreground is the furthest downstream.



Photo 10 (December 2008). West-Central Subbasin sampling location ST4 (Manhole AAT466) and installed sediment traps. The trap in the foreground is the furthest upstream.



Photo 11 (October 2008). East-Central Subbasin sampling location ST2 (Manhole AAT557) and installed sediment traps. The trap in the foreground is the furthest downstream.



Photo 12 (December 2008). East-Central Subbasin sampling location ("ST5", manhole AAX261).



Photo 13 (December 2008). East-Central Subbasin sampling location ST5 (Manhole AAX261) and installed sediment traps. The trap in the foreground is the furthest downstream.



Photo 14. Flow-through sediment trap during development, subsequently installed in eastern subbasin sampling location ST1 (Manhole AAT565).



Photo 15 (February 2009). Eastern subbasin sampling location ST1, with installed “SIFT” pilot study sediment trap.



Photo 16 (June 2009). East-central subbasin inline solids sample location. Solids sample was collected from the 36-inch-diameter line downstream of Manhole AAX261 and sediment trap sample location ST5.



Photo 17 (June 2009). Homogenized inline solids sample collected from east-central subbasin downstream of sediment trap ST5.

Attachment C

Field Notes

2007 Sediment Trap and Inline Solids



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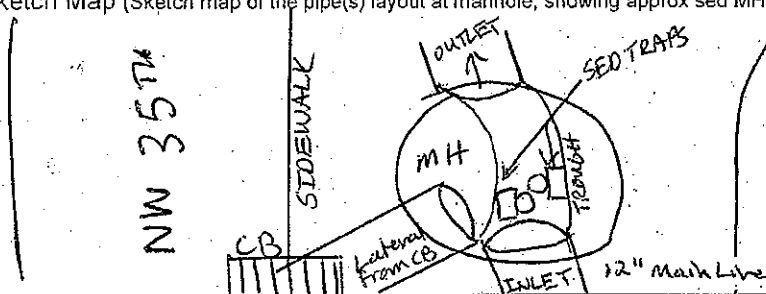


SEDIMENT TRAP FIELD DATA SHEET

SECTION 1 - INSTALLATION INFORMATION

Project Name: <u>Portland Harbor SW.</u>	Project No: <u>1020.005</u>	Date: <u>3/14/07</u>	By: <u>JXB/MJS</u>
Site Address: <u>NW 35th & Yeon Ave.</u>	Describe Traffic Control and site access concerns: <u>Travel eastbound along NW Yeon Ave past 35th Ave. Turn right onto "Frontage Road" after passing 35th Ave. Back entry vein to man hole using sidewalk (south) paralleling Yeon Ave for the</u> <u>Set up work zone & cove off area. Heavy foot traffic joggers @ site.</u>		
PI Code: <u>18-ST1</u>	Hansen ID: <u>AAT565</u>		
Sed trap location (pipe size, distance from node, etc.) - <u>Sed traps located 2" & 6" downstream of inlet. Sed traps were installed in MH trough (adjacent to CB lateral) due to small diameter of main pipe (12"). May get influence from lateral for sed traps & sediment.</u>			
Flow conditions and depth at time of install, sediment in pipe, etc? <u>No flow at site upon arrival, standing water (0.25") at inlet of MH trough a few large metal chunks in MH trough during installation.</u>			

Sed Trap Sketch Map (Sketch map of the pipe(s) layout at manhole, showing approx sed MH location, orient drawing using the top of the page as north):



SECTION 2 - MONTHLY CHECK INFORMATION

Date: <u>4/5/07</u>	By: <u>DJH/JXB</u>	Sed depth per bottle (%): <u>EAST = 20%</u> <u>WEST = 10%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>BOTH BOTTLES FULL OF WATER</u>			
Date: <u>5/14/07</u>	By: <u>MJS, JXB</u>	Sed depth per bottle (%): <u>East = 2%</u> <u>West = 2-3%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>both full of water, debris accumulated on west trap</u>			
Date: <u>6/18/07</u>	By: <u>ECH, MJS</u>	Sed depth per bottle (%): <u>East = 2%</u> <u>West = 1%</u>	Bottles removed and replaced?: <u>Removed for end of season</u>
Comments: <u>Both bottles full of water.</u>			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			



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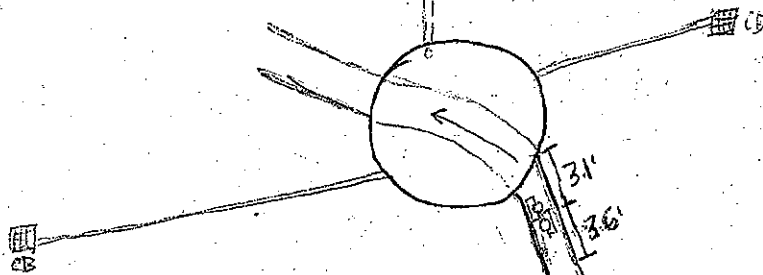


SEDIMENT TRAP FIELD DATA SHEET

SECTION 1 - INSTALLATION INFORMATION

Project Name: Portland Harbor SW. Project No. 1030.005 Date: 3/15/07 By: JXB/JJM
Site Address: 3950 NW. Yeon Ave
Describe Traffic Control and site access concerns:
Travel east bound on NW. Yeon Ave. Turn right onto "Frontage Road" @ American Steel. Set up WVA & Slow TC signs along Frontage Road. Pull entry van into Univac, back entry van up to MH & set up safety cones. Heavy truck traffic along Frontage Road and Univac.
Pt Code: 18-ST2 Hansen ID: AAT 557
Sed trap location (pipe size, distance from node, etc.) -
Sed. Traps installed ~ 3.2' & 3.6' upstream of MH AAT 557 in 42" main line. Bottle Mouths (Bottle 1 "upstream" & downstream) ~ 7" Above invert of main pipe.
Flow conditions and depth at time of install, sediment in pipe, etc?
Active base flow in pipe upon arrival (~ 1.5 fps). Depth of flow approx. 6" 0.75" No sediment in pipe during installation.

Sed Trap Sketch Map (Sketch map of the pipe(s) layout at manhole, showing approx sed MH location, orient drawing using the top of the page as north):



SECTION 2 - MONTHLY CHECK INFORMATION

Date: <u>4/5/07</u>	By: <u>DJH/JXB</u>	Sed depth per bottle (%): <u>UP = 22%</u> <u>DOWN = 22%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>BOTH BOTTLES FULL OF WATER. FLOATING SED OR BIOFILM OBSERVED 30" MINOR SED IN BOTTOM</u> (ORGANIC PARTICLES)			
Date: <u>5/14/07</u>	By: <u>MJS/JXB</u>	Sed depth per bottle (%): <u>UP ~ 3%</u> <u>DOWN ~ 3%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>Both bottles full of water</u>			
Date: <u>6/18/07</u>	By: <u>ELH, MJS</u>	Sed depth per bottle (%): <u>UP = 5%</u> <u>DOWN = 2%</u>	Bottles removed and replaced?: <u>Removed for end of season</u>
Comments: <u>Both bottles full of water, Sed in bottom of bottles</u>			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			

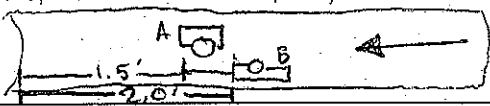


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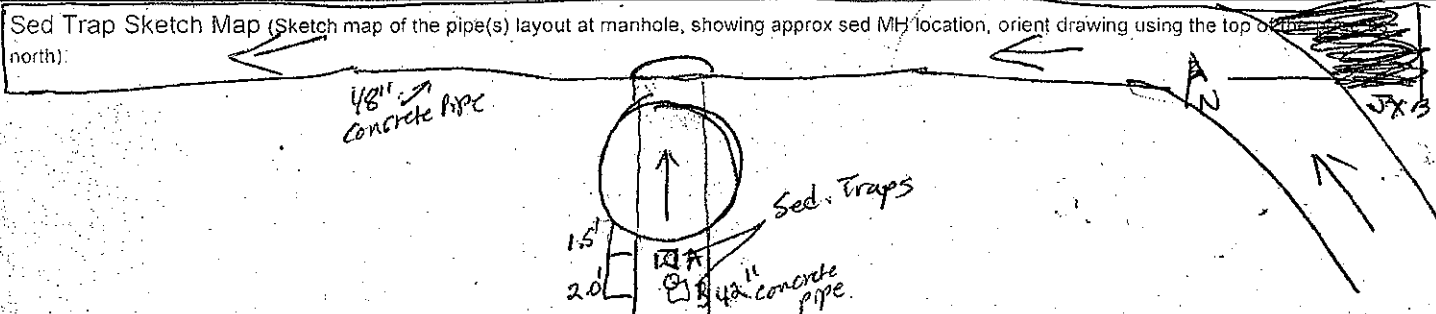
SEDIMENT TRAP FIELD DATA SHEET

SECTION 1 - INSTALLATION INFORMATION

Project Name: <u>Portland Harbor Stormwater Sample</u>		Project No. <u>1020.005</u>	Date: <u>3/15/07</u>	By: <u>Tom JXB</u>
Site Address: <u>4033 NW Yeon</u>		Describe Traffic Control and site access concerns: <u>Nodes AND535 and AAT 466 are located in an American Steel parking lot where parked vehicles over node may cause access issues in the future.</u>		
Pt Code: <u>18-ST3</u>	Hansen ID: <u>AND535</u>			
Sed trap location (pipe size, distance from node, etc.) - <u>42" diameter</u>				
			<u>Sed trap A ~ 1.5' upstream of node AND535</u> <u>Sed trap B ~ 2.0' upstream of node AND535</u>	

Flow conditions and depth at time of install, sediment in pipe, etc?

base flow depth of 4.0" w/ a velocity of approximately 1 fps



SECTION 2 - MONTHLY CHECK INFORMATION

Date: <u>4/5/07</u>	By: <u>JXB/DJH</u>	Sed depth per bottle (%): <u>Bottle 1A < 1%</u> <u>Bottle 1B < 1%</u>	Bottles removed and replaced?: <u>No</u>
Comments: <u>Both bottles full of water & trace amounts of sed < 1% - very clear water</u>			
Date: <u>5/14/07</u>	By: <u>JXB/MJS</u>	Sed depth per bottle (%): <u>Downstream Bottle 1A < 2%</u> <u>upstream Bottle 1B < 3%</u>	Bottles removed and replaced?: <u>No</u>
Comments: <u>Both bottles full of clear water with sed. in bottom of bottles.</u>			
Date: <u>6/19/07</u>	By: <u>MJS/AJA</u>	Sed depth per bottle (%): <u>Bottle A < 1%</u> <u>Bottle B = 1%</u>	Bottles removed and replaced?: <u>End of Pilot Study/End of season</u>
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			



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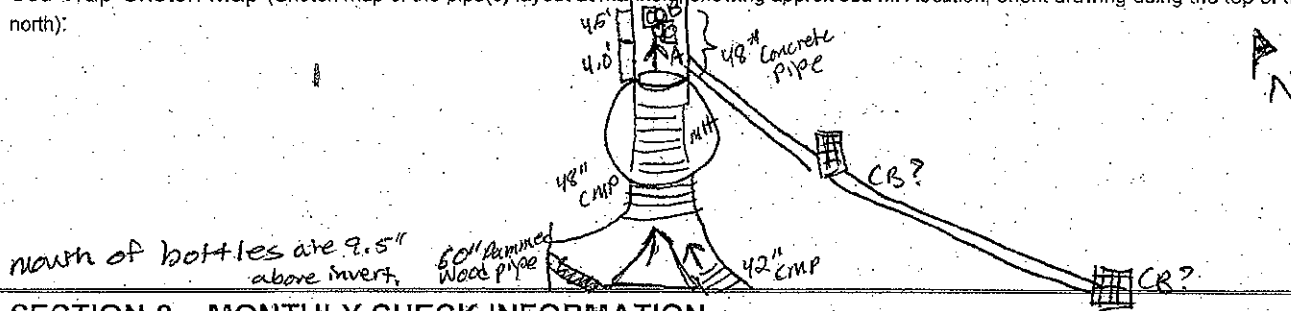


SEDIMENT TRAP FIELD DATA SHEET

SECTION 1 - INSTALLATION INFORMATION

Project Name: <u>Portland Harbor Stream</u>	Project No. <u>1020.005</u>	Date: <u>3/15/07</u>	By: <u>JTM/JXB</u>
Site Address: <u>4033 NW Yeon</u>	Describe Traffic Control and site access concerns: <u>node AAT466 located in American Steel Parking lot.</u> <u>May have parked vehicle covering node in future.</u>		
Pt Code: <u>18-ST4</u>	Hansen ID: <u>AAT466</u>		
Sed trap location (pipe size, distance from node, etc.) - <u>pipe dia. 48"</u> <u>Trap A ~ 3.5' from node, Trap B ~ 4.5' downstream</u> <u>~ 40' downstream</u>			
Flow conditions and depth at time of install, sediment in pipe, etc? <u>baseflow @ 1.5", approximately 1.0 fps</u>			

Sed Trap Sketch Map (Sketch map of the pipe(s) layout at manhole, showing approx sed MH location, orient drawing using the top of the page as north):



SECTION 2 - MONTHLY CHECK INFORMATION

Date: <u>4/15/07</u>	By: <u>JXB/DJH</u>	Sed depth per bottle (%): <u>Bottle 1A < 1%</u> <u>Bottle 1B < 1%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>Both bottles full of clear water 0 trace amounts of sed < 1%</u>			
Date: <u>5/14/07</u>	By: <u>JXB/MJS</u>	Sed depth per bottle (%): <u>Bottle 1A < 3%</u> <u>Bottle 1B < 3%</u>	Bottles removed and replaced?: <u>NO</u>
Comments: <u>Both bottles full of clear water 0 < 3% accumulated sed.</u>			
Date: <u>6/19/07</u>	By: <u>MJS/AJA</u>	Sed depth per bottle (%): <u>Bottle 1A ~ 10%</u> <u>Bottle 1B ~ 10%</u>	Bottles removed and replaced?: <u>yes, end of season</u>
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			
Date:	By:	Sed depth per bottle (%):	Bottles removed and replaced?:
Comments:			



Page 1 of 2

Project Portland Harbor Stormwater Samp.
Location 18-ST2
Subject Sed. Trap Installs

Project No. 1020.005
Date 3/15/07
By JXB/JJM

0920 PST - Left WPCL for 18-ST2

0940 - Arrived on site @ 18-ST2. Verified location of 18-ST2.
JJM enters MH & commences visual inspection of line.

- Approx. ^{JXB 0.75"} 6" of baseflow in pipe. Flow is moving downstream (≈ 1.5 fps).

- No observable sediment in pipe upstream.

- Baseflow not due to storm events - no significant rainfall during the past week.

0950 - JJM installs Sed. Traps $\approx 3.2/3.6'$ upstream of MH AAT557 in 42" diameter main line. Sed. Traps oriented parallel to each other. Bottles were labeled 18-ST2 Bottle #1 upstream & downstream.

1111 Setup to install sediment traps (4) at site adjacent to American Steel which is located at 4033 NW Yeon.

1130 First entry into node AND536 where convergence of 18-ST3 & 18-ST4 is $\approx 15'$ from entry node. Field crew ^{JJM} is concerned w/ safety, so second entry at node AND535 to assess conditions as a suitable alternative. JXB comments on hydrocarbon odor coming from upstream of node.

Baseflow of 4" and approximately 1 fps is not due to storm activity as

Attachments



Page 2 of 2

Project Portland Harbor Stormwater Samp.
Location 4033 NW Yeon
Subject Sed. Trap Installation

Project No. 1020.005
Date 3/15/07
By JTM, JXB

the weather has been mostly dry recently.

18-ST3

1145 JXB decides to install sed. traps upstream of node AND535 and then move to node AAT466 where the second set of traps (18-ST4) will be installed. JXB noted presence of sticks, woody debris and sediment accumulation along invert shoulder and above pipe collar which is probably a result of sorcharging during heavy flows. JXB took photos.

1346 After long, arduous install, JXB took photos and loaded traps. Traps are oriented in a parallel series w/ Trap A approximately 1.5' from node AND535 and Trap B approximately 2.0' from node AND535. Bottles were named Bottle1, 18-ST3, upstream of AND535, Sed. Trap A (or B respectively.) JXB captured photo of set-up.

1403 Moved to AAT466. JXB entered and noted presence of retired line and 42" CMP line converging in a 60" CMP/culvert/vault. JXB to install traps 18-ST4 downstream of 6" lateral (drainage American Steel parking lot) in a 48" line, downstream of node AAT466. The traps are oriented parallel w/ Trap A ~ 3.5' downstream and Trap B ~ 4.5' downstream of manhole. The 48" line exiting the 60" CMP/vault is concrete. Lateral ~ 6.0' upstream of Trap A. JXB comments of presence of sed. deposits upstream of 48" concrete line exiting vault in corners and around retired pipe inlet. Took photos. Also, presence of rust and iron bacteria in CMP vault.

1540 Finished install, loaded bottles, took photos. Left site.

Attachments



Page 1 of 2

Project PORTLAND HARBOR STORMWTR
Location SIX SED TRAPS
Subject FIRST CHECK OF SED TRAPS

Project No. 1020 005
Date 4/5/07
By DJH/JXB

BACKGROUND - JXB/DJH WILL PERFORM
FIRST CHECK OF SEDIMENT TRAPS
INSTALLED ~ 3 WKS AGO

M-1ST1 A45994 ARRIVE 0830

0845 - DJH enters M1-ST1 to assess sed. traps and bottles.
Bottles completely full with water from storm events upon
inspection. Bottles full of orange-colored water

0855 - South bottle @ M1-ST1 had <2% sediment depth of
North bottle ~5% sediment depth. DJH reinstalled ^{original} north/south
bottles back into sed. traps. Bottles not removed.

0905 - Left M1-ST1

18 ST1 AAT565 - ARRIVE 0930. BOTH
BOTTLES FULL OF WATER. EAST BOTTLE ~ 42% SED;
WEST BOTTLE ~ 19% SED. BOTTLES NOT REMOVED.
0950 - OFFSITE

18 ST2 AAT557 ARRIVE AT 1000. JXB
ENTERS. DOWNSTREAM BOTTLE = <1% - APPEARS
TO BE MOSTLY SUSPENDED SEDIMENT OR BIOFILM/ORGANIC
MATERIAL. UPSIDEAM <2% = SLIGHTLY MORE SED
AT BOTTOM. ALSO HAS FLOATING ORGANIC PARTICLES ^{10% OFFSITE}
Attachments SED TRAP FDX (6x)



Page 2 of 2

Project PDX HARBOR STORM
Location SIX Sed Traps
Subject 1st SED TRAP CHECKS

Project No. 1020 025
Date 4/5/07
By DJH/SKB

1028 - Arrived at 18-ST3 AND 535 for monthly Sed. Trap Inspection. DJH enters m.t. Downstream bottle (Bottle A) full of water with trace amounts of sediment <1% upon inspection. Upstream bottle (Bottle B) trace amounts of sediment <1%. Bottles not removed.

1045 - Left 18-ST3 AND 535 for 18-ST4 AAT466 on same site

1054 - DJH enters 18-ST4 AAT466. Both bottles full of water (clear water in bottles). Bottle 1B - trace amounts of sediment <1%. Bottle 1A - trace amounts of sediment <1%. Bottles not removed.

1105 - OFF SITE

19-ST1 - ARRIVE 1115. BOTH BOTTLES FILLED WITH WATER. BOTTLE 1 (SOUTH) <2% SEDIMENT W/ OCC. SUSPENDED SED. BOTTLE 2 (NORTH) <1% TO TRACE SED. W/ OCC. SUSPENDED SED.

1140 - OFF SITE



Page 1 of 2

Project Portland Harbor Stormwater

Project No. 1020-005

Location SIX PROJECT LOCATIONS

Date 5/14/07

Subject Sed trap check NO. 2

By MJS, JXB

M1-ST1 - AAT994 : On site @ 1050

JXB inspects sed traps & bottles

South bottle : Full of water, w/ orange film on surface
bottle is ~ 5% full of dark sediment, reinstalled

North bottle : Full of water, w/ orange surface film.

Bottle is ~ 5% full of dark sediment that appears to be
of low density, & easily resuspended by moving bottle.
Reinstalled bottle in holder

18-ST1 - AAT565 : on site @ 1139

JXB inspects sed traps & bottles

Both bottles are filled w/ clear water with a small
amount of dense sediment on the bottom of the
bottle. dark west sed trap has alot of debris
trapped in it but is not obstructing the bottle mouth

18 STA - AAT 557 on site @ 1205

JXB inspects sed traps & bottles

Both bottles are filled w/ water and contain ~ 3%
sediment on the bottom

18-ST4 - AAT466 on site @ 1240

MJS inspects sed traps & bottles

Both bottles are full of water. Upstream bottle neck obstructed by
rag. Removed rag. Both bottles contain < 3% accumulated
sediment on the bottom of the sample bottles.

Attachments



Page 2 of 2

Project PORTLAND HARBOR STORMWATER

Project No. 1020.005

Location SIX PROJECT LOCATIONS

Date 5/14/07

Subject SED TRAP CHECK NO. 2

By MJS/JXB

18-ST3-AN0535 on site @ 1300. Unable to access site due to semi-truck parked on top of Mt. Contacted American Steel contact, Cindy McCain (sp?). Truck to be moved within the hour. Left site for 19-ST1

19-ST1 on site @ 1313.

MJS Inspects sed. traps & bottles

Both bottles full of water and trace amounts of sediment (Bottle 1 (south) < 2% sed. & Bottle 2 (north) < 1% sed.) accumulated on bottom of sample bottles JXB

18-ST3-AN0535 back on site @ 1345

MJS enters Mt. to inspect sed. Traps & bottles

Both bottles full of clear water. Upstream Bottle 1A contains < 2% accumulated sed. in bottle. Downstream Bottle 1B contains < 3% accumulated sed.

BSS - Left 18-ST3-AN0535 for WPCL

Attachments



1806
R08

Page 1 of 1

Project Portland Harbor SW

Project No. 1020.005

Location M1 ST1

Date 6/18/07

Subject Sample bottle removal for end of year

By MJS, ECA

1040 - on site to pull sample bottles, both are ~10% full w/ very fine unconsolidated material. There is currently no flow but ~6" of standing water in the pipe. There is a pronounced petroleum like sheen on the water surface. There is no sediment in the vicinity of the sed traps - only what appears to be iron oxidizing bacteria settled on the walls of the pipe.

1230 - on site @ 19 ST1 - pulled 2 bottles w/ water and only ~1% sediment each. There was a trace of flow in the pipe. No sediment accumulated in pipe.

1400 - on site @ 18 ST1 - pulled bottles, large amount of trash accumulated upstream of sed traps - small amount of sediment but not possible to separate from trash.

1430 on site @ 18 ST3 - blocked by a fire truck will move on to other sites.

1435 on site @ 18 ST2 - pulled bottles. There was a thin layer of sediment present on sed traps and upstream of sed traps where particles (they were fine) had accreted to the pipe. This material was difficult to collect b/c tended to wash away in the flow - but was able to fill an 8-oz jar. There is more sediment further downstream.



Page 1 of 1

Project Portland Harbor Stormwater Samp
Location 4033 NW Yeon
Subject Sed. Trap removals

Project No. 1020.005
Date 6/19/07
By MJS, AJA

0800 on site @ 18-ST4 - Capped & pulled
~~sed~~ bottles which were ~ 10% filled with
sediment. ~~sediment~~ There was some trash & leaves
accumulated on the sed trap housing, but no
accumulated sediment

0840 - 18-ST3 - Capped & pulled bottles
very little sediment in bottles. Some
~~sed~~ precipitate on pipe surface in the flow
but no real sediment. Precipitate was flushed
away ~~in~~ in the flow when disturbed.

Attachments

Date: <u>6/18/07</u>		SECTION 2 - SAMPLE COLLECTION REPORT		Node: <u>AAT 557</u>	
Sampling Equipment:		<input checked="" type="checkbox"/> Stainless steel spoon & stainless steel bucket directly into jar <input type="checkbox"/> Other (Describe)			
Equipment Decontamination process:		<input checked="" type="checkbox"/> Per SOP7.01a <input type="checkbox"/> Other (Describe)			
Sample date:	Sample time:	Sample Identification: (IL-XX-NNNNNN-rrrrr)			
<u>6/18/07</u>	<u>1435</u>				
Sample location description: (number of feet from node of entry)					
<u>~6' upstream of manhole</u>					
Sample collection technique:		<u>Scraped pipe w/ flat stainless trowel to trap water</u>			
Describe Color of sample:		<u>sediment mixture would have most of the solids into the flow due to fine particle size</u>			
Describe Texture/Particle size:		<u>Very fine</u>			
Describe visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.):		<u>none</u>			
Describe depth of solids in area where sample collected:		<u>< 1/8"</u>			
Describe amount and type of debris in sample:		<u>—</u>			
Amount and type of debris removed from final sample:		<u>—</u>			
Compositing notes: <u>—</u>					
Sample Jars Collected (number, size, full or partial)? <u>partially filled can B-02 jar</u>					
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).					
Lab ID <u>FD070807</u>		Duplicate sample collected? <input checked="" type="checkbox"/> Y/N Dupe ID			
Duplicate sample identification # on COC:					
Any deviations from standard procedures:					

SECTION 3 - PHOTOGRAPH LOG	
Overview of node showing drainage area	
Plan view of sediments inline	
Homogenized sample (sediment in bowl)	
Other?	



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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: <u>PORTLAND HARBOR STORMWATER SAMP.</u>		Project Number: <u>1020,005</u>	
Sample Processing Conducted By: <u>JXB/AJA</u>	Pt. Code: <u>18-ST1</u>	Removal Date: <u>6/18/07</u>	Processing Date: <u>6/19/07 @ 1025</u>
Basin: <u>BASIN-18</u>	Hansen ID: <u>AAT 565</u>	Subbasin:	
Sediment Trap Location Description/Address: <u>NW 35th & YEON (US OF CB INLET AT MH)</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method	<u>90 mm stainless steel filter support w/ conical glass microfiltration assembly & negative air pressure (suction/vacuum).</u>		
Filter Size & Type:	<u>Fisher Brand, Qualitative P5, Cellulose 110mm (5-10um) Filter.</u>		
Sediment Trap Bottle ID: <u>18-ST1-BOTTLE1-WEST</u>		Sediment Trap Bottle ID: <u>18-ST1-BOTTLE1-East</u>	
Total Depth of Accumulated Sed in bottle (inches): <u>0.3"</u>		Total Depth of Accumulated Sed in bottle (inches): <u>0.4"</u>	
Sample Processing Start Time: <u>1025</u>	Sample Processing End Time: <u>1125</u>	Sample Processing Start Time: <u>1133</u>	Sample Processing End Time: <u>1145</u>
Number of Filters Used: <u>8 Filters</u>		Number of Filters Used: <u>3 Filters</u>	
Number of Ultra Pure DI Rinses/est. total volume in mL): <u>3 rinses / ~200 ml</u>		Number of Ultra Pure DI Rinses/est. total volume in mL): <u>2 rinses / ~100 ml</u>	
Dewatered/Filtered Sed. Weight (grams): <u>8.5g</u>		Dewatered/Filtered Sed. Weight (grams): <u>2.3g</u>	
Sample Processing Notes/Comments: <u>Substantial organic component present in sed.</u> <u>Distinct petroleum sheen present in sed.</u>		Sample Processing Notes/Comments: <u>Substantial organic component present in sed w/ distinct petroleum sheen present.</u>	

Composite Time: <u>1148</u>	Total Dewatered/Filtered Sed. Weight: <u>10.8 g</u>	Sample Jars Collected (number, size, full or partial): <u>1-8oz partially filled amber sed. jar</u>
Lab ID:	Duplicate sample collected? <input checked="" type="checkbox"/> Dupe ID	
Duplicate sample identification # on COC:	<u>No deviations from SOP.</u>	



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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: <u>PORTLAND HARBOR STORMWATER SAMP.</u>		Project Number: <u>1020.005</u>	
Sample Processing Conducted By: <u>JXB/ASA</u>	Pt. Code: <u>18-ST2</u>	Removal Date: <u>6/18/07</u>	Processing Date: <u>6/19/07 @ 1229</u>
Basin: <u>BASIN-18</u>	Hansen ID: <u>AAT557</u>	Subbasin:	
Sediment Trap Location Description/Address: <u>3950 NW YEON AVE. (US OF MH)</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method	<u>90 mm Stainless Steel filter support w/ conical glass microfiltration assembly and negative pressure (suction, vacuum)</u>		
Filter Size & Type:	<u>Fisher Brand, qualitative P5, cellulose 110 mm (5-10 um) Filter</u>		
Sediment Trap Bottle ID: <u>18-ST2-BOTTLE1-US</u>		Sediment Trap Bottle ID: <u>18-ST2-BOTTLE1-OS</u>	
Total Depth of Accumulated Sed in bottle (inches): <u>0.3"</u>		Total Depth of Accumulated Sed in bottle (inches): <u>0.3"</u>	
Sample Processing Start Time: <u>1229</u>	Sample Processing End Time: <u>1450</u>	Sample Processing Start Time: <u>1455</u>	Sample Processing End Time: <u>1600</u>
Number of Filters Used: <u>11 Eleven!</u>		Number of Filters Used: <u>14</u>	
Number of Ultra Pure DI Rinses/est. total volume in mL: <u>1 rinse / ~200 mL</u>		Number of Ultra Pure DI Rinses/est. total volume in mL: <u>1 rinse / 200 mL</u>	
Dewatered/Filtered Sed. Weight (grams): <u>29.0</u>		Dewatered/Filtered Sed. Weight (grams): <u>15.5</u>	
Sample Processing Notes/Comments: <u>Suspended Very fine silty/sludgy particles in all parts of the sample. Some small/fine organics. Distinct sheen + very strong Petroleum odor.</u>		Sample Processing Notes/Comments: <u>Same as the first bottle. Very fine silt/sludge suspended in all parts of sample. Sheen and strong odor present.</u>	

Composite Time: <u>1602</u>	Total Dewatered/Filtered Sed. Weight: <u>44.5 g</u>	Sample Jars Collected (number, size, full or partial): <u>1</u>
Lab ID:	Duplicate sample collected? <input checked="" type="radio"/> Dupe ID	
Duplicate sample identification # on COC:		
Any deviations from standard procedures: <u>No.</u>		



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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: Portland Harbor Stormwater Samp.		Project Number: 1020.005	
Sample Processing Conducted By: JXB/ECH	PL Code: 18-ST3	Removal Date: 6/19/07	Processing Date: 6/20/07 @ 0810
Basin: BASIN-18	Hansen ID: AND 535	Subbasin:	
Sediment Trap Location Description/Address: 4033 NW YEON AVE., 42" LINE (US OF MH)			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method	90 mm stainless steel filter support w/ conical glass microfiltration assembly and negative air pressure (suction/vacuum).		
Filter Size & Type:	Fisher brand, qualitative P5, Celulose 110mm (5-10 micron) filter.		
Sediment Trap Bottle ID: 18-ST3-BOTTLE1-A(DOWN)		Sediment Trap Bottle ID: 18-ST3-BOTTLE1-B(US)	
Total Depth of Accumulated Sed in bottle (inches): 40.10"		Total Depth of Accumulated Sed in bottle (inches): 40.10"	
Sample Processing Start Time: 0810	Sample Processing End Time: 0845	Sample Processing Start Time: 0857	Sample Processing End Time: 0908
Number of Filters Used: 3 Filters		Number of Filters Used: 3 Filters	
Number of Ultra Pure DI Rinses/est. total volume in mL: 1 rinse / ~200 ml		Number of Ultra Pure DI Rinses/est. total volume in mL: 2 rinses / ~250 ml	
Dewatered/Filtered Sed. Weight (grams): 1.9 g		Dewatered/Filtered Sed. Weight (grams): 13.9 g	
Sample Processing Notes/Comments: Low sed in suspension. Very little accumulation on bottom of bottle.		Sample Processing Notes/Comments:	

Composite Time: 0915	Total Dewatered/Filtered Sed. Weight: 15.8	Sample Jars Collected (number, size, full or partial): 1 - Jar partially filled, amber sed
Lab ID:	Duplicate sample collected? Y/N <input checked="" type="radio"/> N	Dupe ID
Duplicate sample identification # on COC:		
Any deviations from standard procedures: No		



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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: Portland Harbor Stormwater Samp.

Project Number: 1020.005

Sample Processing Conducted By:

Pt. Code:

Removal Date:

Processing Date:

JXB/ECH

18-ST4

6/19/07

6/20/07 @ 1010

Basin: BASIN-18

Hansen ID: AAT466

Subbasin:

Sediment Trap Location Description/Address:

4033 NW YEON AVE, 48" LINE (DS OF MANHOLE)

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method

90 mm stainless steel filter support w/ conical glass microfiltration assembly and negative air pressure (suction/vacuum).

Filter Size & Type:

Fisher brand, qualitative P5, Celulose 110mm (5-10 micron) filter.

Sediment Trap Bottle ID: 18-ST4-BOTTLE1-A (US EPA)

Sediment Trap Bottle ID: 18-ST4-BOTTLE1-B (US EPA)

Total Depth of Accumulated Sed in bottle (inches): 0.7"

Total Depth of Accumulated Sed in bottle (inches): 0.5"

Sample Processing Start Time: 1010

Sample Processing End Time: 1145

Sample Processing Start Time: 1147

Sample Processing End Time: 1256

Number of Filters Used: 10 filters

Number of Filters Used: 12 filters

Number of Ultra Pure DI Rinses/est. total volume in mL: 4 rinses / ≈ 700 mL

Number of Ultra Pure DI Rinses/est. total volume in mL: 3 rinses / ≈ 500 mL

Dewatered/Filtered Sed. Weight (grams): 42.2 g

Dewatered/Filtered Sed. Weight (grams): 30.9 g

Sample Processing Notes/Comments:
Distinct petroleum sheen present.

Sample Processing Notes/Comments:

Composite Time:

1258

Total Dewatered/Filtered Sed. Weight:

73.1 g

Sample Jars Collected (number, size, full or partial): 1-8oz partially full jar.

Lab ID:

Duplicate sample collected? ☒ Y ☐ N Dupe ID

Duplicate sample identification # on COC:

Any deviations from standard procedures: No

2009 Sediment Traps

Pt. Code		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID
Date:	2/18/09	Estimated sed. depth per bottle (% by volume & inches):	Back end (smaller micron) 'Front end' (larger micron)	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N
By:	ECH	US Bottle	DS Bottle	If removed which one(s)?
		Bottle - trace	Bottle - trace	Final Removal? Y/N
Comments: Front end of filter sock has trace amounts of organic debris and pebbles. Back end of filter sock has trace amounts of very fine to fine sediment. Trace amount of fine sediment on weir on front end of sock impacting sediment deposition of back end but too soon to say exactly how.				Archived ID Holding Sticker
Photos Taken? <input checked="" type="checkbox"/> Y/N Pictures taken up top of back end and front end side by side.				
Date:	3-18-09	Estimated sed. depth per bottle (% by volume & inches):	Front end w/ stamped plate (larger micron)	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N
By:	JXB/JMS	US Bottle	DS Bottle	If removed which one(s)?
		Bottle - 1-2mm of fine stormwater solids	Bottle - 0.5mm of large fine stormwater solids	Final Removal? <input checked="" type="checkbox"/> Y/N
Comments: Leaves & organic debris adhered to front of prototype trap, and on face of weir. Substantial stormwater solids & organics deposited in the first chamber of the trap, with significant fine particles deposited & retained within the second chamber of the trap.				Archived ID Holding Sticker
Photos Taken? <input checked="" type="checkbox"/> Y/N 3/18/09 Primary chamber collected ~ 3.5g of solids. Secondary chamber collected ~ 12.5g of solids.				
Describe: Leaves & organic debris adhered to front of trap & face of weir, & captured solids (fine particle range) - archived subsamples				
Date:	3/30/09	Estimated sed. depth per bottle (% by volume & inches):	First Chamber	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N
By:	AJA/JXB	US Bottle	DS Bottle	If removed which one(s)?
		Bottle - 2mm	Bottle - 0mm	Final Removal? <input checked="" type="checkbox"/> Y/N
Comments: Pipe is dry upon arrival. Some organics + plastics on band. Trap is intact. Checked trap - no sampleable solids, fines starting to accumulate in 2nd chamber. Replaced sampler at 15° angle. Larger stormwater particles (organics, leaf particles, woody particles, lg. seeds) starting to accumulate in 1st Chamber again.				Archived ID Holding Sticker
Photos Taken? <input checked="" type="checkbox"/> Y/N				
Describe:				

Pr. Code 18-571		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AAT-565
Date: 5/18/09	Estimated sed. depth per bottle (% by volume & inches): Primary chamber US Bottle - 5mm DS Bottle - 22.4g	Bottles removed/replaced? Y/N If removed which one(s)? NA	Total Solids Collected to date Primary = 22.4g Secondary = 19.2g	Archived ID JAB 18-571 Primary Cylinder 5/18/09 1028P5
By: JAB, PTB	Comments: Pipe wetted but no active flow. Sed trap intact. Face of trap ~80% clogged. Removed in order to reach ladder pin. Secondary chamber has very strong asphalt odor. Sediment accumulated at bottom of secondary chamber screen is 98% clogged with accretions along bottom 2/3 of cylinder. In deepest part of secondary chamber sediment accumulated up to ~1cm. Medium sands to fines. Coarse particles effectively excluded. Harder to remove sediment from screen than previously. Primary chamber has ~3.5mm at its deepest of accumulation, larger particle sizes and organics. Some sheen and a decomposing organics odor.	Final Removal? Y/N		
Photos Taken? Y/N	Describe: Photo of sed trap together, apart and individually the primary & secondary chambers. Extra photos of close-up secondary chambers and of sample on scoop. Photo of primary chamber sed accumulation & of sediment on sample bag.			18-571 Secondary Cylinder 5/18/09 1028P5
Date: 5/20/09	Estimated sed. depth per bottle (% by volume & inches): Primary chamber US Bottle - trace DS Bottle - trace	Bottles removed/replaced? Y/N If removed which one(s)? N/A	Total Solids Collected to date Primary = 23.4g Secondary = 19.5g	Archived ID
By: MJS, JYB	Comments: Trace amount of pooled water in the floor of the pipe, with very little debris collected around the housing. There was a trace amount of sediment in both chambers. Scraped out and added to appropriate composite.	Final Removal? Y/N		18-571 Primary Cylinder 5/20/09 0904P5
Photos Taken? Y/N	Describe: Photo of trap after removal. Two photos of each chamber showing amount and nature of sediment.			Total archived Solids = 1.0g
Date: 6/4/09	Estimated sed. depth per bottle (% by volume & inches): Primary cylinder US Bottle - trace to minor DS Bottle - trace	Bottles removed/replaced? Y/N If removed which one(s)? End of 08/09 Pilot Study		Archived ID
By: JAB/PTB	Comments: Trap was intact. Minimal amount of organic debris adhered to prototype. Pipe was dry - no baseflow. Trace to minor amounts of solids inside cylinders & filter screens.	Final Removal? Y/N		18-571 Secondary Cylinder 5/20/09 to 6/4/09 0913P5
Photos Taken? Y/N	Describe: Prototype in situ prior to removal, disassembled trap & inside of each cylinder			18-571 5/20/09 to 6/4/09 0913P5

7/18/09

Total solids captured during deployment period:

Primary Cylinder = 23.7g

Secondary Cylinder = 19.4 - 19.5g

Pr. Code 18-ST1		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AA1565
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	
Comments:				Holding Sticker
US Bottle - DS Bottle -				
Photos Taken? Y/N				Archived ID
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - Bottle -	DS Bottle -		
Comments:				Holding Sticker
<div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p><u>Primary Cylinder</u> 18-ST1</p> <p>3/18/09 ~3.5g 5/18/09 + 18.9g ----- 22.4g</p> <p>5/20/09 + 1.0g ----- 23.4g</p> <p>6/4/09 + 0.3g ----- 23.7g</p> <p style="text-align: right;">Total 23.7g</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px;"> <p><u>Secondary Cylinder</u></p> <p>3/18/09 12.5g 5/18/09 + 6.7g ----- 19.2g</p> <p>5/20/09 + 0.3g ----- 19.5g</p> <p style="text-align: right;">Total 19.4g</p> <p>6/4/09 Trace to no solids</p> </div>				
Photos Taken? Y/N				Hansen ID AA1565
Describe:				
Sample ID: FO095692		Duplicate sample collected at this site? Y/N		Duplicate ID:
Duplicate Sample ID on COC:		Any deviations from standard operating procedures? Y/N		
Comments: See Inline Sediment Trap Sample Processing Data Sheet				



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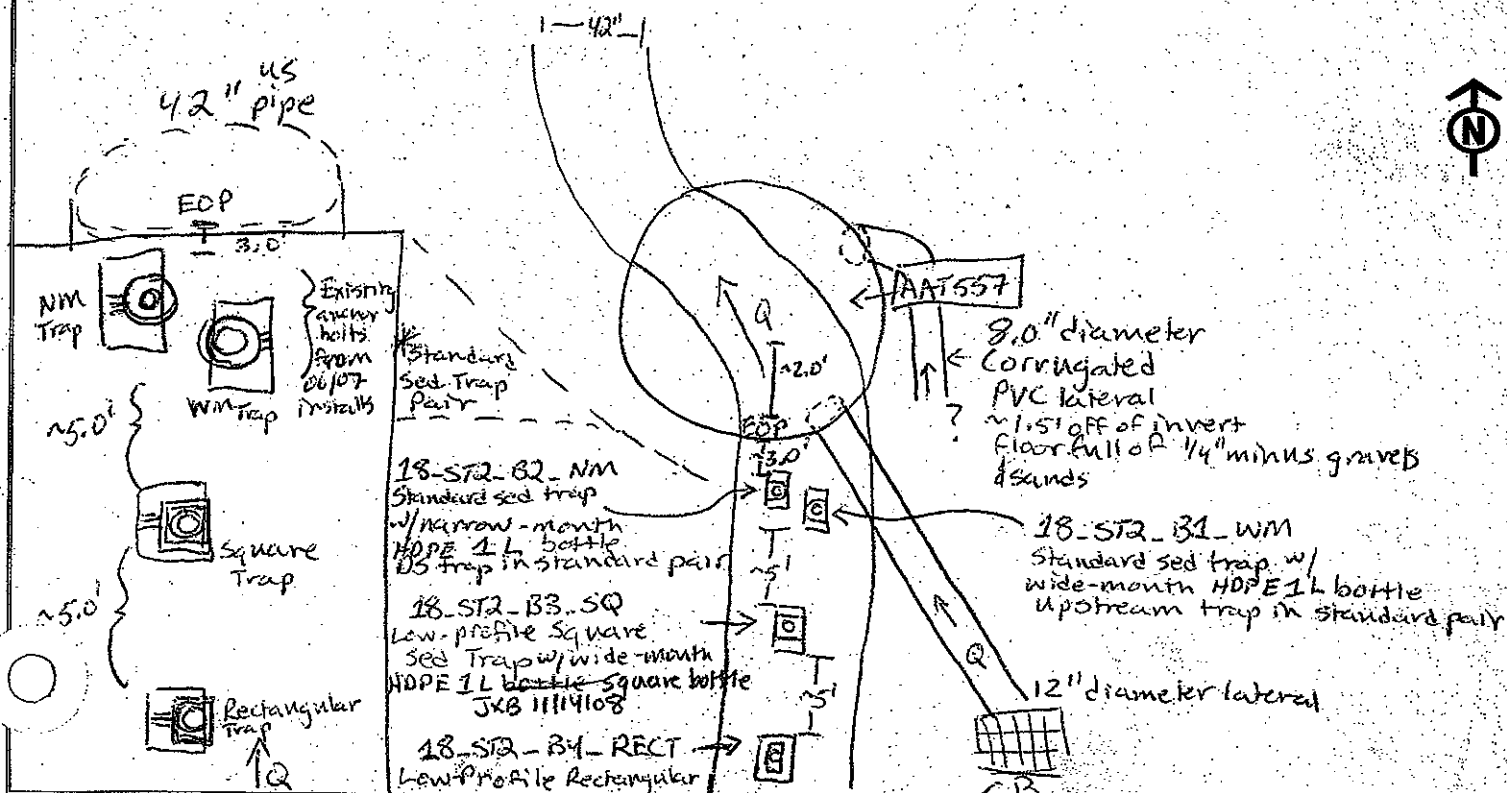


INLINE SEDIMENT TRAP FIELD DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP	Project No.: 1030.005	Date: 10/30/08	By: JXB/AJA
Site Address: 3950 NW YEON AVE	Sample Pt Code: 18-ST2	Basin: 18	Hansen ID: AAT557

SECTION 1 - INSTALLATION INFORMATION

Traffic control and/or site access concerns: <i>Site parallels frontage road off of NW Yeon Ave. Site is located in driveway of Univar (3950 NW Yeon Ave). Due to site location, and heavy delivery & trucked Semi use on frontage road - set up entry w/ East of driveway "cone island around site" USE UWA slow signs on frontage road, just west of site.</i>		Describe flow conditions and depth and/or any standing water at time of install (does river appear to back up into this line intermittently?): <i>Baseflow during install was approx. 0.5" d 0.4 ft. River does not appear to back up into site.</i>
Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.): <i>approx. 0.3-0.4" of biofilm (primarily consisting of decomposing organics, sediment non-organics, etc.) deposited through out the entire extent of the main line.</i>		Sediment trap bottles installed on: <i>10/30/08</i>
Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.): <i>Installed four different sediment trap designs upstream of manhole in 42" diameter pipe just off of pipe invert. Standard sed trap pair installed using 06/07 anchor bolts. standard sed trap pair (wide-mouth & narrow-mouth) installed approx. 5.0' US from center of manhole chamber (3.0' US from EOP). Low-profile trap (square) installed 5.0' US from standard traps.</i>		Pipe diameter (inches): <i>42"</i>
SED TRAP SITE DIAGRAM and low-profile trap (rectangular) installed ~10.0' US from standard traps. (Sketch map of the lateral(s) and layout of manhole, showing approx sed. trap location, manhole elevation and inline sediment if present. Orient drawing using the top of the page as north).		Distance from MH node (feet): <i>5.0' - 15.0'</i>



PI Code 18-ST2		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AAT553
Date: 1-14-09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - <0.2" DS Bottle 3 - trace/ Bottle 2 - ~0.5" Bottle 4 - 0.2"	Bottles removed/replaced? Y/N If removed which one(s)?	Archived ID	
By: JXB, LAP	Final Removal? Y/N JXB 11/15/09			
Comments: All bottles full of stormwater. Baseflow = 0.6" @ 1 fps. Bottles free from obstructions. Minor amount of organics on sediment traps. No odor detected in any bottle. US-Bottle - 18-ST2-B1-WM. Adhesions present. Solids = <0.2" No sheen observed. DS-Bottle - 18-ST2-B2-NM. Adhesions present. Solids = 0.5-0.6". No sheen. 18-ST2-B3-SQ. Adhesions present. Trace amt. solids (<0.1"). Slight sheen observed. 18-ST2-B4-RECT. Adhesions present. Solids = 0.2". No sheen observed.			Holding Sticker	
Photos Taken? Y/N Describe:			Archived ID	
Date: 2/20/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - <0.2" DS Bottle 3 - trace/ Bottle 2 - 0.6" Bottle 4 - 0.2"	Bottles removed/replaced? Y/N If removed which one(s)?	Archived ID	
By: MSS, JXB	Final Removal? Y/N			
Comments: Baseflow present in pipe at depth of 0.3" and 1-1.5 fps. All bottle openings are free of obstructions, but there is paper, tags and organics on sed trap housings. Surface of storm water in bottles has a film of iron-oxidizing bacteria. US-Bottle - 18-ST2-B1 - minor adhesion of fine particles on inside of bottle, <0.2" solids 18-ST2-B2 - minor amount of adhering fines on inside of bottle, 0.6" of sediment DS-Bottle - 18-ST2-B3 - minor amount of adhering fines, <0.1" of sediment 18-ST2-B4 - minor adhering fine particles on inside of bottle, 0.2" of sediment			Holding Sticker	
Photos Taken? Y/N Describe:			Archived ID	
Date: 3/30/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - 0.4" DS Bottle 3 - 0.3" Bottle 2 - 0.6-0.7" Bottle 4 - 0.2"	Bottles removed/replaced? Y/N If removed which one(s)?	Archived ID	
By: AJA JXB	Final Removal? Y/N			
Comments: Organics, paper, non-organics. B2 has a leaf covering opening partially, same w/ B4. US Bottle 1 - Iron Bacteria present, substantial fines on inside of bottle wall. ~0.4" deposited sed. Bottle 2 - Really turbid stormwater, visible sheen on surf. no odor 0.6-0.7" sediment, Trace amounts of adhered fines. DS Bottle 3 - (square) Minor fines on inside of bottle, 0.3" accum. sed. Bott. 4 - Trace fines on inside of bottle, no change in accum. 0.2"			Holding Sticker	
Photos Taken? Y/N Describe:			Archived ID	

Pt. Code 18-ST2		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AAT557
Date: 6/14/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 81 - 0.3" 0.4" DS Bottle 82 ~0.9" Bottle 84 - 0.6" Bottle 83 ~0.4"	Bottles removed/replaced? Y/N If removed which one(s)? End of 08/09 Pilot Study Final Removal? Y/N		Archived ID
By: JKB/PTB	Comments: On site to remove standard trap & alternate design prototype traps @ end of 08/09 pilot study. Baseflow was ~0.75" w/ a flow of ~1.5 fcs. Traps were intact. Organic debris & plastics adhered to trap housings. Plastic trash partially obstructing the alternate design bottle 18-ST2-B4 RECT. All sed trap bottles were full of stormwater w/ fine adhesions on the inside surfaces. B1-WM: Total accumulation of captured solids was ~0.3"-0.4" DS Bottle B4-RECT: Total accumulation of captured solids was ~0.6" B2-NM: Total accumulation of captured solids was ~0.9" B3-SQ: Total accumulation of captured solids was ~0.4"			18-ST2-B1 WM 10/30/08- 6/14/09 1227PST 18-ST2-B2 NM 10/30/08- 6/14/09 1227PST 18-ST2-B3 SQ 10/30/08- 6/14/09 1227PST 18-ST2-B4 RECT 10/30/08- 6/14/09 1227PST
Photos Taken? Y/N	Note: iron bacteria & filamentous algal growth ^{observed} in.			
Describe: Sed. traps in situ prior to removal & organic/plastic trash				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Holding Sticker
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				
Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				
Holding Sticker				

PI Code: 13-512		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID: AA-557
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID:
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				Holding Sticker
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				Holding Sticker
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		Archived ID:
Comments:				
US Bottle -				Holding Sticker
DS Bottle -				
Photos Taken? Y/N				
Describe:				

PI Code: 13-512		SECTION 3 - COMPOSITE SAMPLE		Hansen ID: AA-557
Sample ID: FO095693 affix FO number	Duplicate sample collected at this site? <u>Y/N</u>	DUPLICATE ID:		
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? <u>Y/N</u> Describe:			
Comments: <i>See Inline Sediment Trap Sample Processing Data Sheet</i>				

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INLINE SEDIMENT TRAP FIELD DATA SHEET

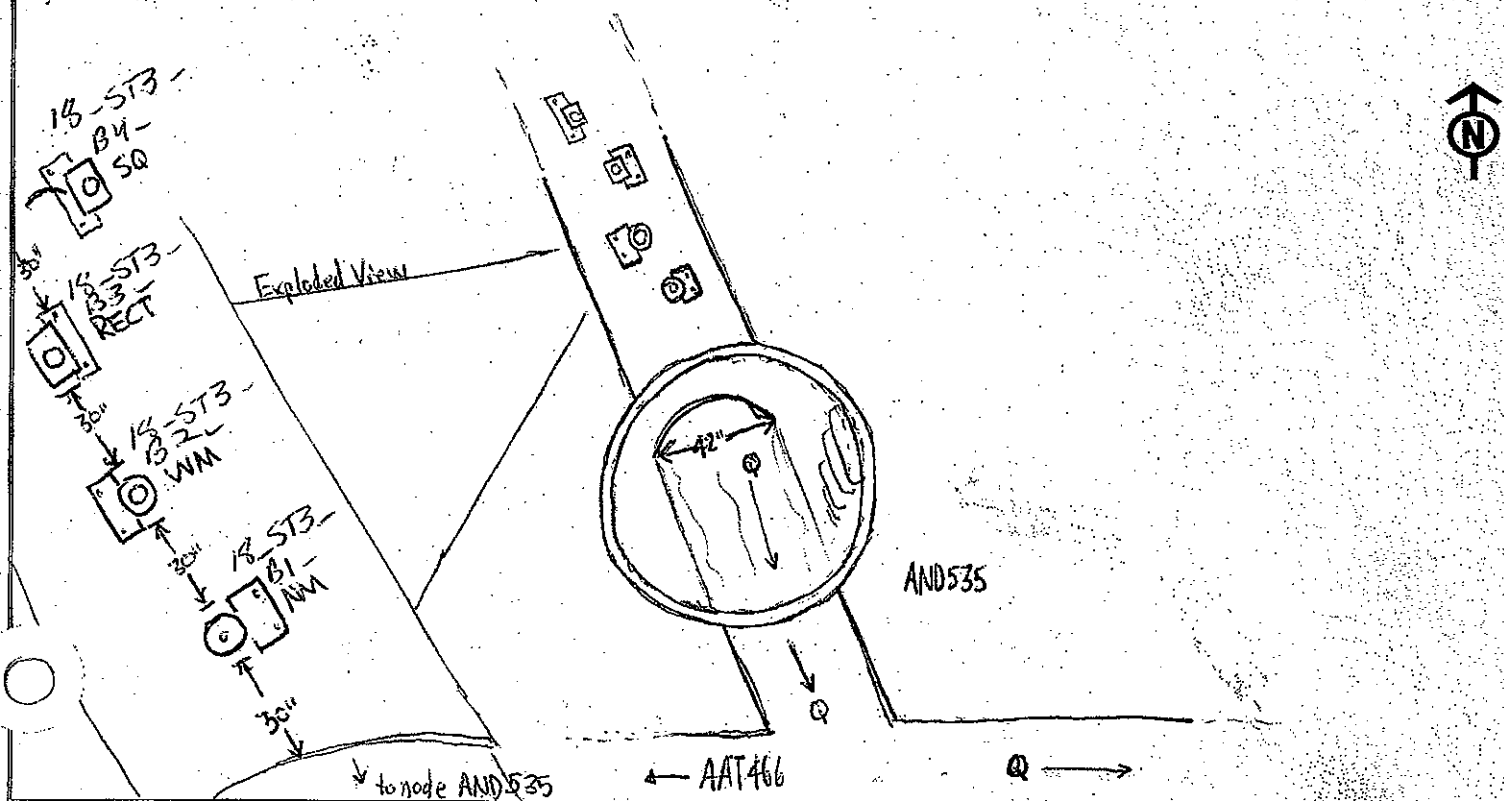
Project Name: <i>Portland Harbor Stormwater Sump</i>	Project No.: <i>1070.005</i>	Date: <i>12/9/08</i>	By: <i>JTM, MJS</i>
Site Address: <i>4033 NW Yeon</i>	Sample Pt Code: <i>18-ST3</i>	Basin: <i>JXB 12/18/08 18 RND</i>	Hansen ID: <i>AND535</i>

SECTION 1 - INSTALLATION INFORMATION

<p>Traffic control and/or site access concerns: <i>N/A</i></p> <ul style="list-style-type: none"> • Potential for parked vehicle obstructing node. <p><i>See 18-ST4 Traffic control and/or site access concerns</i></p>	<p>Describe flow conditions and depth and/or any standing water at time of install (does river appear to back up into this line intermittently?): <i>1.25" ~ 2 fps baseflow</i></p> <ul style="list-style-type: none"> • River does not appear to backup at this location.
<p>Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.):</p> <ul style="list-style-type: none"> • No sampleable sediment present 	<p>Sed trap bottles installed on: <i>12/9/08</i></p>
<p>Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.):</p> <ul style="list-style-type: none"> • Traps located upstream of node ~30" apart beginning 30" from EOP in node. 	<p>Pipe diameter (inches): <i>42"</i></p> <p>Distance from MH node (feet): <i>30"</i></p>

SED TRAP SITE DIAGRAM

(Sketch map of the lateral(s) and layout of manhole, showing approx sed. trap location, manhole elevation and inline sediment if present. Orient drawing using the top of the page as north).



Pr. Code		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID
Date:	12-513	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N	Archived ID
1-14-09		US Bottle ¹ - 4.9" DS Bottle ³ - 2.5"	If removed which one(s)?	
By:	JXB, LAP	Bottle ² - ~3.4" Bottle ⁴ - 3.5"	ALL	
			Final Removal? <input checked="" type="checkbox"/> Y/N	
Comments: All bottles full of stormwater; No odor or sheen detected. All R & D bottles had been filled more than halfway by solids. Bottles were stratified by larger organic debris (eg. pine needles, twigs) intermixed w/ fine sediment. No sidewall adhesions. All bottles archived. New bottles installed. US Bottle ¹ - 18-ST3-B1-NM \Rightarrow 18-ST3-B5-NM 18-ST3-B2-WM \Rightarrow 18-ST3-B6-WM DS Bottle ³ - 18-ST3-B3-RECT \Rightarrow 18-ST3-B7-RECT 18-ST3-B4-SQ \Rightarrow 18-ST3-B8-SQ Base flow was ~2.0' @ 1.5-2.0 f/s removed 1/14/09 @ 1350 pST				
Photos Taken? <input checked="" type="checkbox"/> Y/N				
Describe: Photo of significant woody debris around all trap housings & Archived bottles.				
Date:	2/20/09	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N	Archived ID
By:	MJS, JXB	US Bottle ¹ - \emptyset DS Bottle ³ - \emptyset	If removed which one(s)?	
		Bottle ² - \emptyset Bottle ⁴ - \emptyset	Final Removal? <input checked="" type="checkbox"/> Y/N	
Comments: All bottle openings are free of obstruction. Housings have some organic material & plastics accumulated on them, along w/ iron oxidizing bacteria on surface of traps & base flow. There is base flow averaging ~1.8" in depth and moving at ~1 f/s. All 4 bottles are free of stormwater and any associated sediment. Level never got sufficiently high to submerge bottles since 1/14/09.				
Photos Taken? <input checked="" type="checkbox"/> Y/N				
Describe:				
Date:	3/30/09	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? <input checked="" type="checkbox"/> Y/N	Archived ID
By:	AJA/JXB	US Bottle ¹ - \emptyset DS Bottle ³ - 0.6"	If removed which one(s)?	
		Bottle ² - ~0.1" Bottle ⁴ - ~0.1"	Final Removal? <input checked="" type="checkbox"/> Y/N	
Comments: Organics adhered to bottom 1/3 of all sed traps. Base flow was ~2.3" at 2.5 f/s all openings are free from obstructions. Strong hydrocarbon odor in Node (manhole vault). US Bottle ¹ - Bottle 5 has no water, no sediment. Bottle 6 has about 1-2" of stormwater and a few flecks of sediment deposited in bottom of bottle. Bottle ³ - Rectangular (BT) ~0.6" sediment, full of stormwater, no odor, no adhered sed. DS Bottle ⁴ - Bottle 8 (square) ~0.1" accumulated sed, full of stormwater.				
Photos Taken? <input checked="" type="checkbox"/> Y/N				
Describe:				

PR Code 18-ST3		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AN0535
Date: 6/1/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 86 ~ 0.5-0.6" DS Bottle 85 ~ 0.5-0.6" Bottle 83 ~ 1.2" Bottle 87 ~ 1.5"	Bottles removed/replaced? Y/N If removed which one(s)? End of 08/09 Pilot Study Final Removal? Y/N		Archived ID 18-ST3-85 NM 11/4/09 6/1/09 1055 PST 18-ST3-86 NM 11/4/09 6/1/09 1059 PST 18-ST3-87 RECT 11/4/09 6/1/09 1059 PST
By: JXB/PTB Comments: On site to remove standard narrow-mouth sed trap of the alternate design prototype traps @ the end of the 08/09 Pilot Study deployment period. All four traps were full of stormwater. Minor organics adhered to trap housings. All four of the bottle openings were free of obstructions. Trace adhesions observed on inside surfaces of bottle walls. Capped sed trap bottles removed trap bottles & housing. US Bottle Iron bacteria observed on housings & main line. Captured solids appear to be in the large coarse particle fraction. 86 - WM: Total accumulation of solids was ~ 1.0" 88 - RECT: Total accumulation of solids captured was ~ 1.2" DS Bottle 85 - NM: Total accumulation of solids captured was ~ 0.5"-0.6" 87 - RECT: Total accumulation of captured solids was ~ 1.5"				
Photos Taken? Y/N				
Describe: Photo of traps in situ prior to removal & accumulation of captured solids				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID 18-ST3-88 50 11/4/09 6/1/09
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				
Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				

Pl. Code 14-513		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AN0535
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		<div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center;">Holding Sticker</div>
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		<div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center;">Holding Sticker</div>
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				

Pl. Code 14-513		SECTION 3 - COMPOSITE SAMPLE		Hansen ID AN0535
Sample ID: affix FO number	FO095694	Duplicate sample collected at this site? <input checked="" type="checkbox"/> Y/N	DUPLICATE ID: Dup	
Duplicate Sample ID on COC: affix FO number	FO095697	Any deviations from standard operating procedures? <input checked="" type="checkbox"/> Y/N		
Describe:				
Comments: <i>See Inline Sediment Trap Sample Processing Data Sheet</i>				

SECTION 2 - MONTHLY FIELD CHECK INFORMATION			Hansen ID AAT466
Date: 1-14-09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - ~0.9" DS Bottle 3 - 0.2-0.3" Bottle 2 - 0.2" Bottle 4 - 0.6"	Bottles removed/replaced? Y/N If removed which one(s)? Final Removal? Y/N	Archived ID
Comments: All bottles full of stormwater. Baseflow = 1.2" @ c. 5 fps. 18-ST4-B1-RECT: totally obstructed by plastic bag - bag carefully removed. full of stormwater; no adhesions. Solids are angled in bottle. Upstream side 1.1" → downstream side c. 8" w/ an average of 0.9" depth. No odor or sheen noted. Marked upstream side of bottle w/ Sharpie for future. 18-ST4-B2-WM: full of stormwater; no adhesions. Solids = 0.2". No sheen or odor detected. DS Bottle 18-ST4-B3-SQ: full of stormwater; no adhesions. Solids = 0.2-0.3". No sheen or odor detected. 18-ST4-B4-VM: full of stormwater; no adhesions. Solids = 0.6". No sheen or odor detected.			Holding Sticker Visits & observations JXB 1/15/09
Photos Taken? Y/N Photo of 18-ST4-B1-RECT with obstructed by plastic bag prior to removal.			
Date: 2/20/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - 0.8" DS Bottle 3 - 0.2-0.3" Bottle 2 - 0.3" Bottle 4 - 0.6"	Bottles removed/replaced? Y/N If removed which one(s)? Final Removal? Y/N	Archived ID
Comments: Baseflow of 0.1" moving at ~0.2 fps. Openings of all bottles are free of obstruction. There is accumulated paper, plastics, and organics on sed. trap housing. US Bottle 1 - Full of stormwater, minor adhesion of sed. on inside of bottle. Bottle 2 - Full of s.w. some adhesion of fines on interior walls. DS Bottle 3 - Full of s.w., trace adhesion on interior walls. Bottle 4 - Full of s.w., no adhesion of fines on walls.			Holding Sticker 0.3" of sediment deposited on an angle w/ 1.5" upstream and 0.7" downstream 0.3" of sediment variable distribution of sed., averaging 0.2-0.3"
Photos Taken? Y/N			
Describe:			
Date: 3/30/09	Estimated sed. depth per bottle (% by volume & inches): US Bottle 1 - ~1.3" avg. DS Bottle 3 - 0.2-0.3" Bottle 2 - 0.3" Bottle 4 - 0.7-0.8"	Bottles removed/replaced? Y/N If removed which one(s)? Final Removal? Y/N	Archived ID
Comments: Strong hydrocarbon odor in pipe. Baseflow = 0.6" at 1.0 f/s. All 4 housings and bottles have organic debris on them. Bottles are full of stormwater, and openings are unobstructed. Plastic also present on housings. US Bottle 1 - Rectangular batt. Seds. are thicker/deeper on u/s side of bottle: 1.6" at u/s side, 1.0 at d/s side. no adhesion of fines to sides. Bottle 2 - wide mouth, some trace adhesions toward bottom, depth = ~0.3". DS Bottle 3 - Square bottle, 0.2-0.3", minor adhesions to inside of batt. Bottle 4 - Narrow mouth, 0.7-0.8", some adhesion to inside.			Holding Sticker
Photos Taken? Y/N			
Describe:			

SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID
Date: 5/30/09	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N
By: MSS, JXB	US Bottle - Bottle -	If removed which one(s)?
Comments:		Final Removal? Y/N
US Bottle -		Holding Sticker
DS Bottle -		
Photos Taken? Y/N		
Describe:		
Date: 6/4/09	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N
By: JXB/PTB	US Bottle B1 ~2.0" DS Bottle B2 ~0.3" Bottle B3 ~0.2" Bottle B4 ~1.0"	If removed which one(s)?
Comments: On site to remove all four sediment traps @ the end of the 08/09 Pilot Study deployment. Traps were in tacted minor build up of organics on trap housings. All four traps were full of captured stormwater w/ fine adhesions on the inside surface of the bottle. Bottle openings on all four traps - except for the standard trap 18-ST4-B4 - were free of obstructions. Left partially obstructing bottle opening on B4.		Final Removal? Y/N
DS-Bottle - B1: Total accumulation of solids was on average depth ~2.0" (ranging between 1.2" - 2.1" - 1.7") (greater depth of solids deposited on upstream side of bottle) B2: Total accumulation of solids was ~0.3" B3: Total accumulation of solids was ~1.0" B4: Total accumulation of solids was ~0.2"		Holding Sticker
Photos Taken? Y/N		
Describe: Traps in situ prior to removal of organic debris / bottle opening obstruction		
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N
By:	US Bottle - DS Bottle - Bottle - Bottle -	If removed which one(s)?
Comments:		Final Removal? Y/N
US Bottle -		Holding Sticker
DS Bottle -		
Photos Taken? Y/N		
Describe:		

Pt. Code: 16-511		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID: AAT-166
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID:
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				Holding Sticker
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				Holding Sticker
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		Archived ID:
Comments:				
US Bottle -				Holding Sticker
DS Bottle -				
Photos Taken? Y/N				
Describe:				

Pt. Code: 16-511		SECTION 3 - COMPOSITE SAMPLE		Hansen ID: AAT-166
Sample ID: FO095695 affix FO number	Duplicate sample collected at this site? Y	DUPLICATE ID:		
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y			
Describe:				
Comments: <i>See Inline Sediment Trap Processing Field Data sheet.</i>				

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INLINE SEDIMENT TRAP FIELD DATA SHEET

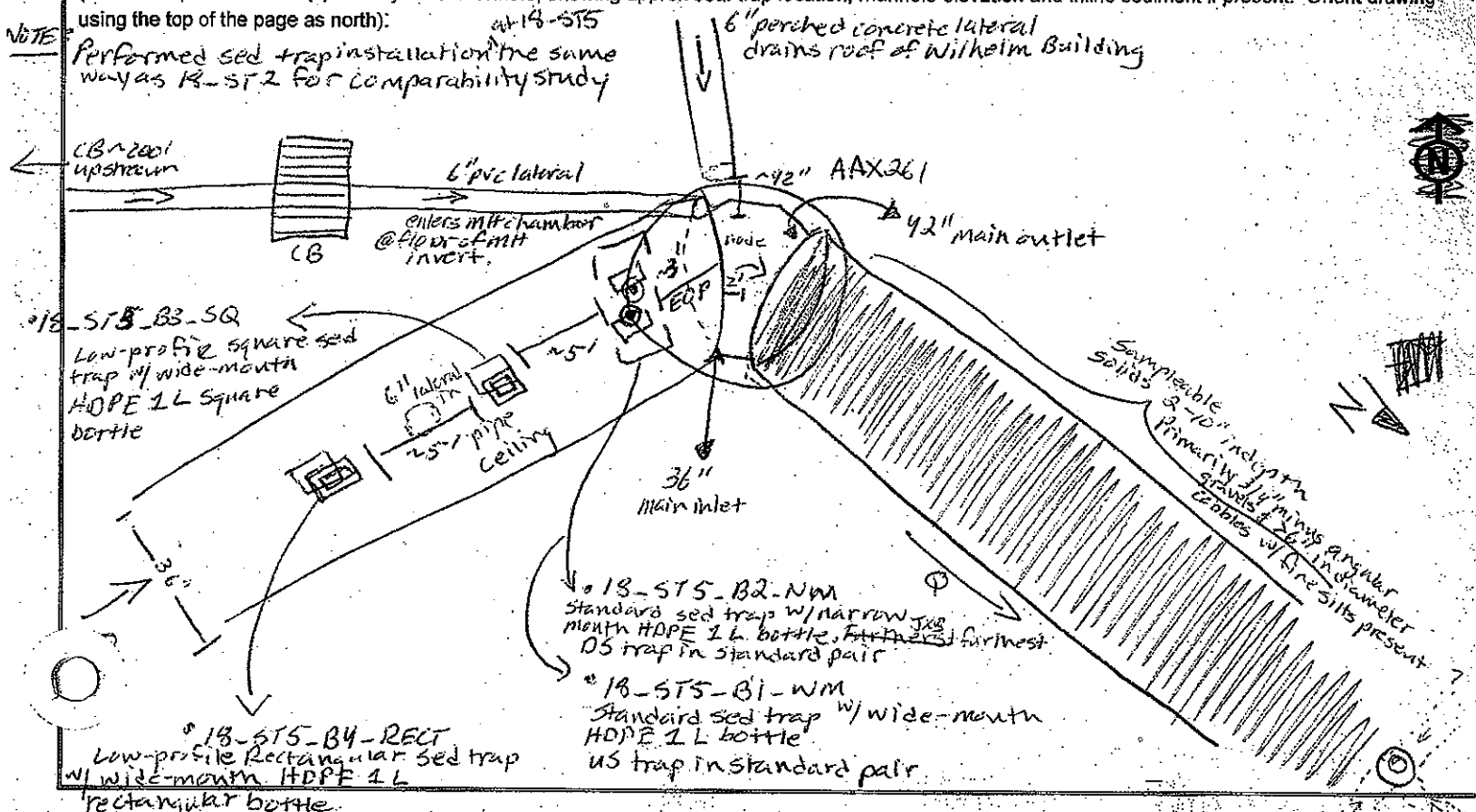
Project Name: Portland Harbor Stormwater Sump	Project No.: 1020-005	Date: 12/4/08	By: JXB/RLB
Site Address: 3250 NW St. Helens Rd.	Sample Pt Code: 18-ST5	Basin: 18	Hansen ID: AAX261

SECTION 1 - INSTALLATION INFORMATION

Traffic control and/or site access concerns: Site is located directly behind Wilhelm Trucking. Contact Wilhelm Trucking prior to accessing site to make sure that no access issues are present. Make sure to leave enough room around work zone that Wilhelm forklifts & trucks can pass. Light traffic at site.	Describe flow conditions and depth and/or any standing water at time of install (does river appear to back up into this line intermittently?): - ~0.1" of base flow @ ~0.5 fpm in US main line - Standing water due to pipe sag in OS outlet, is ~2.0" in depth from MHC chamber extending OS in outlet - River does not appear to back up into pipe
Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.): Sampleable quantities of sediment present in 42" main outlet. Depth of sediment ranges between 2-10" and primarily consists of angular 3/4" minus gravels and cobbles >6.0" in diameter w/ fine silts present 10-20% of bulk material	Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.): Installed 4x different sediment trap designs US of manhole AAX261 in 36" diameter pipe just off of pipe invert. Standard sed trap pair (wide-mouth & narrow-mouth HOPE bottles) installed approx 57.0' US from MHC chamber (~3.0' US from PP). Low-profile square trap installed ~5.0' US from standard traps & low-profile rectangular trap installed ~57.0' US from low-profile square trap.
SED TRAP SITE DIAGRAM (Sketch map of the lateral(s) and layout of manhole, showing approx sed. trap location, manhole elevation and inline sediment if present. Orient drawing using the top of the page as north):	

NOTE:

Performed sed trap installation the same way as 18-ST2 for comparability study



SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID: AAX 261
Date: 1-14-09	Estimated sed. depth per bottle (% by volume & inches): US-Bottle 1 - trace Bottle 2 - 0.2" DS-Bottle 3 - <0.2" Bottle 4 - ~0.4"	Bottles removed/replaced? Y(N) If removed which one(s)? Final Removal? Y(N)
By: JXB, LAP		
Comments: All bottles full of stormwater. Baseflow = 0.2" @ 0.5 fps. 18-ST5-B1-WM: Full of stormwater, with fines adhered to inside wall of bottle (adhesions). Trace amt. of solids (<0.1"). No visible sheen. No apparent odor. US-Bottle 18-ST5-B2-NM: Full of stormwater; adhesions. Solids = 0.2" No visible sheen. No apparent odor. DS Bottle 18-ST5-B3-SQ: Full of stormwater; adhesions. Solids (<0.2") @ very bottom of bottle. Slight sheen observed. Faint 'paint' odor. 18-ST5-B4-RECT: Full of stormwater; adhesions. Solids have settled at an angle. Total depth ranges from 0.3 - 0.5" w/ an average depth of 0.4". Slight sheen observed. Faint 'paint' odor.		Holding Sticker
Photos Taken? Y(N)		
Describe:		
Date: 2/20/09	Estimated sed. depth per bottle (% by volume & inches): US-Bottle 1 - <0.1" DS Bottle 3 - <0.2" Bottle 2 - 0.2" Bottle 4 - ~0.4"	Bottles removed/replaced? Y(N) If removed which one(s)? Final Removal? Y(N)
By: MJS, JXB		
Comments: All 4 bottles are full of stormwater and openings are unobstructed. All bottles have some organic material accumulated around the housings. There is ~0.1" of base flow moving at ~1 fps US-Bottle 18-ST5-B1 - Full of stormwater; trace amounts of sediment 18-ST5-B2 - Full of stormwater, ~0.2" of sediment DS-Bottle 18-ST5-B3 - minor fines adhering to interior of bottle, Full of stormwater, ~0.2" sediment 18-ST5-B4 - iron bacteria on bottle, Full of stormwater, minor amount of fines adhered to inside of bottle, ~0.4" of sediment		Holding Sticker
Photos Taken? Y(N)		
Describe:		
Date: 3/30/09	Estimated sed. depth per bottle (% by volume & inches): US-Bottle 1 - ~0.1" DS-Bottle 3 - 0.2" Bottle 2 - 0.3" Bottle 4 - 0.4-0.5"	Bottles removed/replaced? Y(N) If removed which one(s)? Final Removal? Y(N)
By: ASA, JXB		
Comments: All four bottles are full of stormwater. Organics around sed trap housings, but bottle openings appear to be unobstructed. Base flow is about ~0.1" at 0.5 f/s. NO discernable odors in any sample. B1+B2 - ~0.3" sed US Bottle 18-ST5-B1 - (Wide mouth) Fines adhered to sides, some unconsolidated sed (~0.1") 18-ST5-B2 - (Narrow mouth) Fines adhered to side of bottle ~0.3" sed accum. at bottom of bottle DS Bottle 18-ST5-B3 (Square bott) Fines on inside of bottle ~0.2" sed 18-ST5-B4 - Bottle opening 50% obstructed w/ leaf. Fines adhered to sides of bott. 0.4-0.5" accumulated sed. Some floating material in B4		Holding Sticker
Photos Taken? Y(N)		
Describe: Note: 6" lateral entering main pipe bwn bots 3+4, never been noticed before, no daylight observed when looking up pipe but nearest C.B. has sed sock installed which would block out light		

Pr. Code 18-ST5		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Pinson ID AAx261
Date: 6/4/09	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By: MJS/AJA	US Bottle 1 - Trace ✓ Bottle 2 - 0.5" ✓ DS Bottle 3 - 0.2" ✓ Bottle 4 - 0.9" ✓	Final Removal? Y/N		
Comments: All four bottles full of stormwater. BS opening obstructed by plastic bag covering ~30% of mouth. Sed trap housings all have some debris (plastics + organics) on them. Very small baseflow (~1/4" depth), some filamentous bacteria on bottom of pipe w/ 1/4" depth. Some silty material on walls, easily dislodged, no film, no odor. US Bottle 18-ST5-B1 - wmt - Material on walls, easily dislodged, no film, no odor. DS Bottle 18-ST5-B2 - NM - small amount adhered to bottle walls easily dislodged. Film on surface, reddish in color. Decomposed organics odor. DS Bottle 18-ST5-B3 - SQ - 30% opening obstructed by latex glove, slight film on surface. Material on walls. Decomposed organics odor. 18-ST5-B4 - rect. Pronounced surf. film reddish in color, some sed on inside wall.				Holding Sticker
Photos Taken? Y/N				
Describe: Overview + close ups of all bottles				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	
Comments:				Holding Sticker
US Bottle - DS Bottle -				
Photos Taken? Y/N				
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	
Comments:				Holding Sticker
US Bottle - DS Bottle -				
Photos Taken? Y/N				
Describe:				

Pt. Code 18-515		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID AA3261
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		
Comments:				Holding Sticker
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				Holding Sticker
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		Archived ID
Comments:				
Bottle -				Holding Sticker
DS Bottle -				
Photos Taken? Y/N				
Describe:				Holding Sticker

Pt. Code 18-515		SECTION 3 - COMPOSITE SAMPLE		Hansen ID AA3261
Sample ID: FO095696 affix FO number	Duplicate sample collected at this site? Y ^(N)	DUPLICATE ID: _____		
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y ^(N) Describe:			
Comments: See Inline Sediment Trap Sample Processing Data Sheet				



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Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location BASINS 44A, 43 & 13 (R&D)

Date 10/30/08

Subject INLINE SED TRAP INSTALLS

By JXB / AJA

18-ST2 R&D (cont.) - AJA enters AAT557. Entrant notes that anchor bolts from previous sed trap install are still present in invert of pipe & can be used for ^{a portion of} R&D installs.

Entrant installs each of the four different sed traps for use in Basin 18 R&D. Existing anchor bolts used to install standard sed traps ^{that will contain} ~~of~~ narrow-mouth & wide-mouth 1L HDPE bottles. For exact sed trap locations & measurements refer to 18-ST2 Inline Sediment Trap Field Data sheet. Entrant ^{donned} ~~added~~ new gloves & installed all four 1L ^{JXB} HDPE R&D bottles. Sed trap bottles were secured & bottle caps were removed by entrant. Bottle caps were placed into a clean, ^{labeled} ~~labeled~~ bag to be stored for the entire deployment period @ 18-ST2. Photo of all four test traps taken by entrant facing US @ EOP of 42" main line.

Left site for Basin 43 to install a standard sed trap pair @ 43-ST1 (ABC290).

¹⁴⁰⁰
~~1500~~ - Arrive on site to install a pair of standard sed traps ^{JXB} DS of ABC290 in 16.0" terra cotta pipe. Site 43-ST1 is located at N. River & Albina. Entrant confirmed pipe diameter as 16.0" both US & DS. Mainline is terra cotta. Entrant began to install sed traps. During installation entrant noticed what appeared to be sanitary flow seeping into ABC290 ^{along} ~~at~~ DS ^{JXB 11/14/08} manhole sidewall. Entrant took an ecoli sample. ^{Sed Trap JXB} Install was aborted until sample results (see copy of CCS on file for sample JXB 11/14/08).

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location Basins 44A, 43 & 18(R&D)

Date 10/30/08

Subject INLINE SED TRAP INSTALLS

By JXB/AJA

0951 PST - Arrive on site @ 44A-ST2 [N. Larabee & Randolph/ABC311] to install ^{additional} sed trap bottles & housing for secondary (standard) sed traps, located approx. 9.0' DS from primary sed traps. Primary sed traps & bottles, along with secondary sed trap base plates were installed on 10/17/08 @ this site.

AJA prepares to make entry. Entrant caps primary sed trap bottles w/ site's designated clean bottle caps, ^{wearing clean gloves} prior to moving DS in main line to install secondary sed trap housing. Entrant notes accumulation of organic leaf debris around primary sed trap base plates. Primary sed trap bottles are full of stormwater w/ ~~mouths~~ ^{bottle mouths} of bottles free of obstructions. JXB 12/16/08

Entrant installed secondary sed trap housing w/ clean gloves; secured decontaminated 1L HDPE narrow-mouth bottles in secondary sed traps & removed bottle caps w/ clean gloves. Bottle caps from primary & secondary sed trap bottles were placed into clean, individual Ziplock bags for deployment period storage & labeled. Photo taken of primary & secondary sed trap pairs in situ.

1035 - Left site for Basin 18 R&D site AAT557.

1130 - Arrive on site @ 18-ST2 [3950 NW Yeon Ave (AAT557)] to install four different sed trap ^{designs} for Basin 18 R&D. JXB 11/14/08

1) Standard Sed Trap w/ 1-L HDPE, narrow-mouth bottle

2) Standard Sed trap w/ 1-L HDPE, wide-mouth bottle

Attachments 3) Rectangular low-profile 1L HDPE wide-mouth ^{bottle} trap

4) Square low-profile 1L HDPE wide-mouth bottle trap



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Project Portland Harbor Stormwater Camp

Project No. 1020.005

Location Basin 18 - 18-ST5

Date 12/4/08

Subject Basin 18 Sed Trap R&D Installation

By JXB/RCB

1145 PST - Arrive on site @ 3250 NW St. Helens RD (Wilhelm Trucking). Locate node # AAX261. Site code designated as 18-ST5. RCB prepares to install 4X different sed trap designs @ this site for Basin 18 R&D. RCB enters AAX261. Entrant confirms inlet main pipe diameter as ¹²¹⁸36.0". Outlet main pipe diameter is 42.0". Two laterals enter node AAX261 within the MHC chamber. A 6.0" PVC lateral enters at invert in floor of MHC chamber & a perched 6.0" concrete lateral enters approx. 42" above MHC chamber floor. JXB 108

1205 - Entrant notes presence of 2-10" in depth of deposited sediment along the entire extent of the DS 42" diameter main outlet. Deposited sediment primarily consists of 3/4" minus angular gravels and cobbles >6.0" in diameter. Contacted LAS. Determination made to install sed traps us of node in ^{36"}~~36.0"~~ diameter inlet due to volume of solids in DS line.

Entrant installed all four of the different sed trap designs similar to 18-ST2 ^{JXB} install for comparability study. Entrant rinsed sed traps w/UPDI after securing base plates. Entrant installed each of the different sed trap bottles. Bottles were secured in housing & entrant removed bottle caps ^{while...} wearing clean gloves. Bottle caps were placed in clean ziplock bag for duration of deployment period.

18-ST5 R&D Sed Trap Installation:

- Standard sed trap w/ 1 L HOPE narrow-mouth bottle
- Standard sed trap w/ 1 L HOPE wide-mouth bottle
- Low-profile rectangular sed trap w/ 1 L HOPE wide-mouth rectangular bottle
- Low-profile square sed trap w/ 1 L HOPE wide-mouth square bottle

1500 - Left site to return to WPCL

Attachments

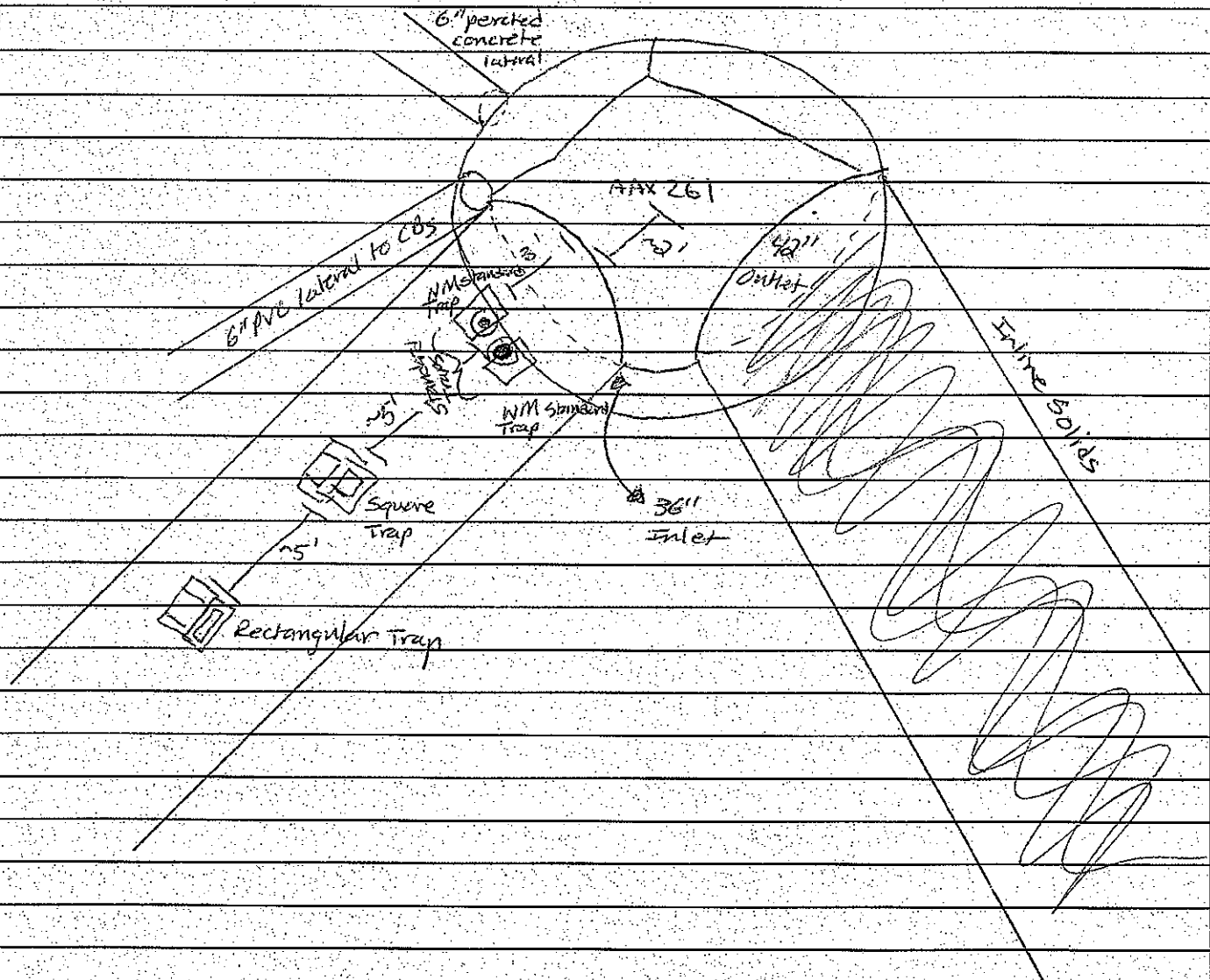


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Project Portland Harbor Stormwater Sump
Location Basin 18 - 18-ST5
Subject Basin 18 Sed Trap R&D Installation

Project No. 1020.005
Date 12/4/08
By JXB/RCB

18-ST5 Schematic/Plan View - AAX261



Attachments



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Project Portland Harbor Stormwater Sampling
Location NW Portland
Subject 18-ST3 installation

Project No. 1020.005
Date 12/19/08
By JTM, MJS

AND 535 1040 Arrive on site @ 4033 NW Yeon

18-ST3

Mount US

42" line

1103 Entrant was able to re-use bolts from previous install (on 315107) and then installed 1 rectangular and 1 square sediment trap upstream of previous.

1110 Labeled bottles 18-ST3-#- Bottle type. The # corresponds to location upstream of node AND 535 and Bottle type is NW for narrow mouth, WM for Wide Mouth, RECT for rectangle and SQ for square mouth. bottles JXB 12/19/08

1136 Entrant removed bottle caps, captured photos of installation. See Inline Sediment Trap Field Data Sheet for diagram of bottle location/install.

1200 Departed site.

Attachments



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Project PORTLAND HARBOR STORMWATER SAND

Project No. 1020.005

Location BASIN 18 - 18-ST3 & 18-ST4

Date 12/9/08

Subject BASIN 18 SED TRAP R&D INSTALLATION

By JXB/RCB/JJM/MJS

1040 PST - Arrive on site @ 4033 NW Yeoman Ave (American Steel) to install four different sediment traps ^{designs} @ 18-ST3 (AND535) & 18-ST4 (AAT466) for Basin 18 R&D. MJS to install sed traps @ 18-ST3. RCB to install sed traps @ 18-ST4.

R&D Sediment Traps:

- Low-profile rectangular trap w/ 1L HDPE w/ rectangular plastic bottle
- Low-profile square trap w/ 1L HDPE w/ square plastic bottle
- Standard sed trap w/ 1L HDPE w/ plastic bottle
- Standard sed trap w/ 1L HDPE w/ Boston-round plastic bottle

1115 - RCB enters 18-ST4 (AAT466) to install all four sed trap designs. Anchor bolts from previous sed trap installs (06/07 deployment period) are unusable (punched through pipe or stripped). RCB to install all four traps DS from previous placement, and DS from CB lateral. Traps to be installed US from 20° downslope ^{JXB} ~~from~~ in main pipe.

Entrant installs all four sed traps. Sed trap base plates & housing are rinsed w/ UPDI after being secured. Entrant installs sed trap bottles & secures bottles in traps. Entrant removed bottle caps wearing clean gloves & placed bottle caps in ^{labeled} 'Clean Ziplock bag' for storage during entire extent of deployment period.

1221 - Leave Basin 18 R&D sites for WPCU

Attachments



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Project Portland Harbor Stormwater Samp Project No. 1020.005
Location Basin 18 R & D Date 1-14-09
Subject Initial Sediment Trap checks By LAP, JXB

* All times in PST JXB 1/15/09

1100 : Arrive on-site @ 3250 NW St. Helens Rd.
(18-ST5 - AAX261)

Entrant notes that all four bottles are free of obstruction. Some organic debris observed around base of sediment trap housings, primarily on the upstream side. All bottles full of stormwater. Baseflow 0.2" @ 0.5 fps at time of entry.

1236 : Depart 18-ST5.

1239 : Arrive on site @ 4033 NW Yeon Ave
(18-ST4 - AAT466)

Entrant notes organics & plastics wrapped around baseplate & housing of all bottles upon arrival. 18-ST4-BI-RECT was totally obstructed by a plastic bag. Photo taken. Plastic bag carefully removed. All bottles full of stormwater. Baseflow 1.2" @ 0.5 fps at time of entry.

1314 : Entry of 18-ST3-AND535. Entrant notes organic debris (wood) around trap housing. Photo taken. Baseflow = 2.0" @ 1.5 - 2.0 fps at time of entry.

Attachments



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Project Portland Harbor Stormwater Samp.
Location Basin 18 R & D
Subject Initial sed. trap checks

Project No. 1020.005
Date 1-14-09
By LAP, JXB

18-ST3 cont.

All R & D bottles more than half filled by solids. All bottles archived & photographed. Time of removal = 1350 PST 1/14/09. Bottles installed 12/9/08.

New bottles installed, numbered sequentially.

STB
11/15/09
18-ST3-B1-NM \Rightarrow 18-ST3-B5-NM
18-ST3-B2-WM \Rightarrow 18-ST3-B6-WM
18-ST3-B3-RECT \Rightarrow 18-ST3-B7-RECT
18-ST3-B4-SQ \Rightarrow 18-ST3-B8-SQ

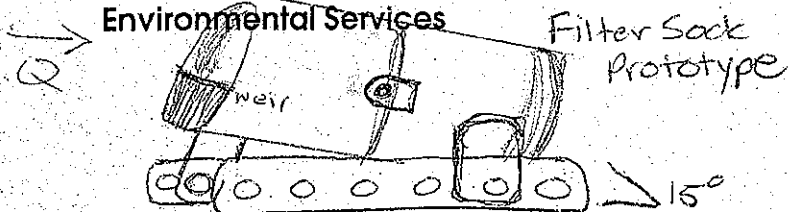
1446: Depart 18-ST3.

1455: Arrive on site @ 3950 NW Yeon Ave
(18-ST2; AAT557)

Entrant notes minor ^{amts. of} organic debris on sediment trap housing - no obstructions. Baseflow = 0.6" @ 1 fps at time of entry. All bottles full of stormwater. No odor detected in any bottle.

1536: Depart site.

Attachments



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Project Portland Harbor Stormwater Samp.

Project No. 1020.005

Location Basin 18- 18-ST1

Date 2/5/09 ^{JXB} 2/4/09

Subject Inline Filter Sock Prototype Install

By JXB/MJS

BACKGROUND: High pressure ridge throughout region. Prolonged dry period (1/29 - 2/4) w/moderate temperatures following Arctic frontal systems (Jan & Dec).
* All times in PST

1441 - Arrive on site @ 18-ST1 (AAT565) - NW 35th Ave & Yeon
On site to install inline "Filter Sock" prototype. Filter sock prototype to be installed US of AAT565 in 12" diameter, circular concrete main inlet (US from '06/07 standard Inline Sediment Trap anchor bolts). MJS confirms all pipe diameters as 12".

1500 - MJS installs large filter sock prototype approx. 6" US from 12" diameter inlet FOP. Filter sock is approx 1" US from CR inlet entering manhole chamber. Stainless steel scissor-jack band & all stainless ^{filter sock} components deconed @ WPCL prior to installation. Decon procedure included: Scapy, tap rinse; acetone rinse; DI water rinse; and ultrapure DI water rinse. Band & components were wrapped in aluminum foil for transport into field. Took photos of installation.

Filter sock prototype installed in 12" diameter pipe using 12" diameter scissor-jack band. US face of filter sock (weir) angled upwards off of the band & pipe invert ~15 degrees. Height of from pipe invert to top of weir = ~4.5" - 5.0".

Angle (pitch) of filter sock after install = 15°

ID of sock cylinder = ~3.75"

Length of sock cylinder = ~6.25"

Weir height = ~1.5"

1530 - Off site

Attachments

Approx. volume = ~69.03 cubic inches



Page 1 of 1

Project Portland Harbor Stormwater Project No. 1070.005
Location NW 55th + Yeon Date 2/18/09
Subject First check By ECH

1424 Arrive at 18-511. Set up coverage

1434 Entrant enters node. Notes organics around the band. Trap was intact.

1442 With clean gloves entrant passes front end and back end up for pictures

1445 Front end appears to collect organic debris and pebbles. Back end seems to collect very ~~fine~~^{fine} fine sediment. The weir on the front end seems to impact back end collection but it's too early to speculate how it is exactly impacting (see photos to observe sediment collection pattern on back end). Some collection of ~~fine~~^{fine} sediment on the wall of the back end.

1448 Entrant returns back end and front end to housing. Confirms angle of install $\rightarrow 15^\circ$

Background

This experimental trap has been installed for two weeks. There has been a dry period since the last notable but small storm event on 2/10/09.

Attachments



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Project Portland Harbor Stormwater Samp

Project No. 1020-005

Location Basins 18 & 43

Date 2/20/09

Subject Basin 18 R&D Inline Sed Trap Checks

By JXB/MTS

* All times in PST

0935 - Arrived in Basin 18 to conduct second inspection of inline sediment traps for Basin 18 R&D Project.

FO inspected the following sites:

18-ST2

18-ST3

18-ST4

18-ST5

1145 - Left Basin 18 for 43-ST1

1200 - Arrived on site @ 43-ST1. Heightened ESCSO construction activities @ Albina River ST Shaft are still occurring. Unable to access site 43-ST1.

Left 43-ST1 for WPCL.

Attachments



Page 1 of 2

Project Portland Harbor Stormwater Samp.

Project No. 1020,005

Location Basin 18 R&D - 18-STI Filter sock

Date 3/18/09

Subject Filter Sock Prototype Check

By JXB/MTS

BACKGROUND: Intense, yet sporadic showers of rain events have occurred during the last week and a half throughout the region.

*All times in PST.

0830 - Arrive on site @ 18-STI (NW 35th & Yeon^{AVE} (AAT565)) to inspect the filter sock prototype, following several spring like showers of rain events. MTS prepares to enter Mlt. This is the second check of the filter sock prototype since its installation on 3/4/09.

Leaves & organic debris adhered to the front of the trap & the face of the weir. However, the trap opening is not obstructed. Took photo of debris & of trap insitu. Entrant removed filter sock for visual inspection.

First chamber:

The first chamber (chamber w/ weir & stamped stainless plate) had large ^{stormwater} particles, & organics & leaves adhered along the front edges of the trap, as well as ^{being deposited} inside the chamber. Small filamentous, organic particles, along with some smaller stormwater solids were retained on the stamped stainless plate on the back of the chamber, as well as being deposited in the lower third (invert) of the chamber. Took a photo of the captured solids w/ supernatant in the chamber. Carefully scrapped & removed solids from first chamber using a decontaminated stainless spatula. Large organic particles were removed from subsample (<30% of bulk material). Captured solids (subsample) were placed in a 402 sample jar & will be archived back @ the WPC.

Second Chamber:

The second chamber (chamber w/ stamped stainless back plate & fine gauge screen) had approx. 0.5 mm in average thickness of fines deposited ^{Attachments} in the lower third of the chamber's invert, w/ an additional



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Project Portland Harbor Stormwater Samp
Location Basin 18 R&D - 18-ST1 Filter Sock
Subject Filter Sock Prototype Check

Project No. 1020.005
Date 3/18/09
By JXB/MJS

Second Chamber (cont.):

1-2 mm in total thickness of fines & supernatant retained on the face of the fine gauge screen. Took photos of captured fines.

Stripped & removed ^{the} deposited fines from the chamber's invert using a deconed stainless spatula, and ^{removed} the fines retained on the surface of the fine gauge screen. Subsample material from the second chamber was placed in a 4-oz sample jar & will be archived back @ the WPC.

Notes: A small volume of supernatant passed through the second chamber's fine gauge screen when the fines were ^{disturbed} scraped & removed from the surface of the screen. ^{Based on visual observations} the lost supernatant did not have a large proportion of suspended particles (supernatant was fairly clear).
0924 -

Subsample material from the first & second chambers was placed in a cooler w/ chilled blue ice for subsequent transport back to the WPC. Subsample jars to be archived in Field Operations Lab fridge until the completion of the Basin 18 R&D deployment period.

Field Observations:

It appears that the filter sock prototype is adequately segregating different stormwater particle ranges (i.e., fine particles are allowed to passively flow through the first chamber and then be deposited &/or retained within the second chamber; while larger particle ranges (organics & stormwater solids > 67 μ m) appear to only be deposited &/or retained in the first chamber. The second chamber of the trap appears to have a lower energy regime ~~than~~ ^{vs} compared to the first chamber's.

18-ST1 - Chamber 1 wet weight = 3.5g

~~18-ST1~~ 18-ST1 - Chamber 2 wet weight = 12.6g

Attachments

JXB



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Project Daily Field notes
Location Basin 18 RD
Subject Set trap checks

Project No. 1020.005 ^{JXB} 3/30/08
Date 3/3/09
By AJA / JXB

Time = PST

0910 Leave WPCL for Basin 18 - ST5

0940 Arrive on site for normal bottle inspection

1115 On site at 18-ST4 ^{18-ST3} after having to return to WPCL to pick up a camera

1210 Onsite at 18-ST2 for a check

1305 Onsite at 18-ST1 for a check

Attachments



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Stormwater Sample

Project PDX Harbor Sediment Trap - JRS

Project No. 1020-005

Location OF 18, NW 35th & NW YEON-18-ST1

Date 5/18/09 (Times in DST)

Subject Sed Trap Check of Prototype

By JRS, PTB

1118 Entry made to check sed trap prototype. Entrant observes sed trap intact with debris built up around the trap housing; ^{primarily} consisting of organics, sediment and some plastics. Entrant to remove debris around the trap. Observes the trap opening to be plugged with organic debris. ^{plastics} Trap looks to be ^{100%} plugged. Trap was removed from pipe. Upon disassembly of the trap a strong asphalt odor off-gassed from the secondary chamber and was gone within a matter of seconds.

1128 ^{Archived} Sample jars ^{swirled} filled w/ new material (captured solids)

1149 After sediment removal into sample jars, sed trap was redeployed.

1215 Back at WPCL weighed composite jars. Primary cylinder total wet weight = 22.4g. Secondary cylinder total wet weight = 19.2g. This gives a total accumulation since last collection of ^(3/18/09) 6.7g in the secondary cylinder and 18.9g in the primary cylinder.



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Project Portland Harbor Stormwater Samp.

Project No. 1020.005

Location Basin 18 (18-ST1) NW 35th & Yeon

Date 5/20/09

Subject Filter sock prototype check

By JXB, mjs

* All times in PST

Background: Distinct storm event occurred on 5/18/09 @ 1900 - 5/19/09 @ 1200. Total measurable precipitation registered by Yeon Raingage was ~ 0.36". Filter sock prototype was checked prior to storm event on 5/18/09 @ 10:18 PST. All solids were removed at that time from trap, prior to forecasted storm event.

0904 - Arrive on site @ 18-ST1 [NW 35th & Yeon Ave (AATSGS)]

Filter sock prototype was intact. Minor organic debris & plastics on trap housing. Pipe was wetted ^{with pooled water} but no flow. Removed trap for inspection. Took photos of traps & solids.

Trace amounts of stormwater solids captured in primary & secondary cylinders w/ some solids adhered to ^{interior} back plates & filter screen.

- Primary cylinder had trace amounts of sediment, mainly large organic particles. ^{Total} Captured solids following storm event = ~ 1.0g
- Secondary cylinder had trace amounts of sediment, primarily ^{consisting} of fine silt & clay sized particles. ^{Total} Captured solids following storm event = ~ 0.3g

* Total wet weight of solids captured during storm event = 7.3g

Total weight of solids captured between initial installment on 2/4/09 through 5/20/09: Primary cylinder = ~ 23.4g; Secondary cylinder = ~ 19.5g [^{total} 42.9g to date]

0938 - ^{JXB} Took photos of solids & trap. Re-installed filter sock prototype. Attachments & left Basin 18



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location Basin 18 R&D PILOT STUDY

Date 6/4/09

Subject FINAL TRAP REMOVALS - 18-ST1

By JXB/PTB

0813 PST - Arrive on site @ 18-ST1 - AAT565 (NW 35th & Yeon Ave) to remove inline sediment sleeve prototype @ end of deployment period. Inline sediment sleeve, formerly known as the inline "filter sock", was intact upon arrival. PTB prepared to enter AAT565. Pipe is dry, no baseflow. Minimal build up of organic debris on prototype housing & ^{in situ} scissor-jack band. Removed debris. Took a photo of prototype ^{in situ} prior to final removal. Removed assembly from pipe.

Dismantled primary & secondary sediment sleeve chambers. Trace solids captured in cylinder's ^{JXB} and adhered to surface of filter screens. Took a photo of cylinder's. Attempted to remove trace solids from each cylinder & filter screen. Scrapped primary cylinder w/ deconed spatula. Captured minor amount of very dry fine silts & clay particles from primary cylinder (~^{0.3} 52g) & added to archived sample jar. Scrapped secondary cylinder. Trace solids captured (~^{0.1} 50g). Captured solids were primarily fine silts & ^{JXB} clay particles. Added solids to archived sample jar.

0840 - Set up for a field decon blank.



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Project PORTLAND HARBOR STORMWATER STAMP

Project No. 1020.005

Location Basin 18 RD PILOT STUDY SITES

Date 6/4/09

Subject FINAL TRAP REMOVALS
JXB

By JXB/PTB

0955 - On site @ 18-ST4 (AAT466) to remove pilot study sed traps @ end of 08/09 deployment. PTB prepared to enter AAT466 for last inspection & ^{subsequent} removal of standard sed. trap & prototype traps. Minor amounts of organics on trap housings. Bottle openings on all of the traps, except for 18-ST4-B4-NM (Narrow-mouth Standard trap) are free of obstructions. Leaf partially obstructing 18-ST4-B4-NM opening. Entrant carefully removed leaf after securing bottle caps on traps upstream from 18-ST4-B4-NM. Entrant then capped last sed trap bottle. Took a photo of debris/obstructions of traps in situ prior to securing bottle caps & subsequent trap removals.

Base flow was minimal ~ 0.1-0.2". Removed traps & trap housing. All four sed trap bottles were full of stormwater w/ minimal solids captured in 18-ST4-B2-WM (wide-mouth prototype) & 18-ST4-B3-SQ (square prototype). Bottles were double-bagged and placed in cooler w/ bagged chilled blue ice for transport back to WPCF to be archived. PTB 6/11/09

1045 - On site @ 18-ST3 (AND535) for final removal @ end of 08/09 Pilot Study. Base flow was ~ 0.5" @ of flow of ~ 1.0 fps. Minor buildup of organics on trap housings. Bottle openings on all four traps (standard narrow-mouth & prototype traps) were free of obstructions. All four sed trap bottles were full of stormwater w/ trace adhesions on inside bottle walls. Took a photo of traps in situ prior to removal. Capped sed trap bottles & removed for subsequent processing. Archived trap bottles. Removed trap housings. Note: due to Area - Spinning anchor bolt & base plate was left installed @ this site (notify maintenance) #20 - Off site.

Attachments

PTB by double bagging the trap bottles and placing them in cooler w/ bagged chilled blue ice



Page 2 of 2

Project PORTLAND HARBOR STORMWATER SYMP.

Project No. 1020.005

Location BASIN 18 R&D PILOT STUDY SITES

Date 6/4/09

Subject FINAL TRAP REMOVALS

By JKB/PTB

1206 - Arrive on site @ 18-ST2 - AATSS7 (3950 NW YEON AVE) to archive & remove standard & alternate design sed. traps @ end of 08/09 Pilot Study deployment. PTB entered AATSS7. Base flow was ~0.75" w/ flow @ ~1.5 fps. Entrant noted minor organics adhered to housing of standard trap 18-ST2-B2-NM w/ plastic trash & organics adhered to alternate design trap 18-ST-B1-WM. Took a photo of debris & traps in situ prior to capping bottles & removing sed traps.

Alternate design trap 18-ST2-B4-RECT bottle opening ^{JKB} was partially obstructed by plastic trash. Both alternate design traps (18-ST2-B3-SQ & 18-ST2-B4-RECT) housing had trace organic debris w plastics. Entrant carefully removed plastic obstruction from B4. Capped bottles ~~after taking photo in situ~~ ^{JKB} & removed for subsequent processing. Placed double bagged sed trap bottles in cooler w/ bagged chilled blue ice for archiving & transport to WPCL. Removed trap housing from line.

1255 - Off site. Return to WPCL.



Page 1 of 1

Project PDX Harbor Stormwater
Location 3250 NW St. Helens Rd.
Subject Basin 18 STS sed trap removal

Project No. 1020-005
Date 6/4/09
By AJA/MJS

1020 Arrive onsite at Wilhelm Trucking 3250 NW St. Helens Rd. Set up entry equipment in order to retrieve sed traps

1040 Initial check of all 4 sed trap bottles complete. Begin removal of sed trap bottles

B2 @ 1045	} Cap + removal times	Descriptions of Bottles in Sed Trap Data Sheet.
B1 @ 1048		
B3 @ 1052		
B4 @ 1053		

1110 ~~Sta~~ Custody seals placed, bottles bagged and placed in coolers w/ ice

1122 Bottles put away sed trap housings removed
Base plates are left in place.

End of sed trap retrieval.

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4592
(503) 823-5696



City of Portland
Chain-of-Custody
Bureau of Environmental Services



Date: 6/11/09
Page: 1 of 1
Collected By: JKB/PTB/ADA
JSM/LAP

Project Name: PORTLAND HARBOR STORMWATER SAMP

File Number: 1020.005

Matrix: SEDIMENT

Requested Analyses

Basin 18 Sediment Trap Pilot Study Chain-of-custody

Sediment traps installed: 10/30/08 (18_ST2), 12/4/08 (18_ST5), 12/29/08 (18_ST3, 18_ST4), 2/4/09 (18_ST1)

Sediment traps removed: 6/4/09 (All Of 18 sites)

* Total Solids to be done at WPCL, care should be taken to use the smallest aliquot possible to retain sample volume for additional follow-up analyses.

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	PCB Aroclors (Low-level)	Pesticides (Low-level CAS)	SVOCs (low-level CAS)	PAH + Phthalates (Low-level)	Herbicides (TA)	Grain Size	TOC	TS	Total Metals (As, Cd Cr, Cu, Pb, Mn, Ni, Ag, Zn) + Hg	Comments
FO095692	ST-18-AA1565-0809 NW 35th & YEON	18_ST1	6/11/09	805	C	X						X	●		39.2% 41.5 g Total Wet Weight
FO095693	ST-18-AA1557-0809 3950 NW YEON AVE	18_ST2	6/9/09	1359	C	X						X	●		45.9% 223.3 g Total Wet Weight
FO095694	ST-18-AND535-0809 4033 NW YEON AVE	18_ST3	6/9/09	1500	C	X						X	●		56.5% 3902.8 g Total Wet Weight 3860.2 g - PH
FO095695	ST-18-AA1466-0809 4033 NW YEON AVE	18_ST4	6/10/09	1315	C	X						X	●		65.9% 492.2 g Total Wet Weight
FO095696	ST-18-AXX261-0809 3250 NW ST HELENS RD	18_ST5	6/10/09	1655	C	X						X	●		59.7% 163.4 g Total Wet Weight
FO095697	DUPLICATE	DUP	6/9/09		C	X						X			56.5%

Relinquished By: 1

Relinquished By: 2

Relinquished By: 3

Relinquished By: 4

Signature: [Signature]	Time: 10:30	Signature: [Signature]	Time: 10:30	Signature: [Signature]	Time: 10:30	Signature: [Signature]	Time: 10:30
Printed Name: Kristian Bantier	Date: 6/11/09	Printed Name: [Signature]	Date: [Signature]	Printed Name: [Signature]	Date: [Signature]	Printed Name: [Signature]	Date: [Signature]
Received By: 1	Time: 10:30	Received By: 2	Time: [Signature]	Received By: 3	Time: [Signature]	Received By: 4	Time: [Signature]
Signature: [Signature]	Date: 6/11/09	Signature: [Signature]	Date: [Signature]	Signature: [Signature]	Date: [Signature]	Signature: [Signature]	Date: [Signature]
Printed Name: Kristian Bantier	Date: 6/11/09	Printed Name: [Signature]	Date: [Signature]	Printed Name: [Signature]	Date: [Signature]	Printed Name: [Signature]	Date: [Signature]

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

INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP. Project Number: 1020.005

Sample Processing Conducted By: JXB/PTB/LAP	Sample Pt. Code: 18-STI	Removal Date: 6/4/09	Processing Date: 6/11/09
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Basin: 18 R&D Winter 2009 Pilot Study Hansen ID: **AAT 565** Subbasin: **N/A** 7/18/09

Sediment Trap Location Description/Address: "Filter Sack" prototype was installed ~6.0' upstream of the end of pipe (EOP) in the circular, concrete 12" diameter main inlet. Filter Sack was installed via scissor jack band. Prototype was set at an up angle of ~15°. Trap was installed ~1.0' up from CB inlets.

NW 35th & Yeon Ave

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:	Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].
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Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper):

Fisher Scientific, qualitative P5, 5-10 µm cellulose filter

Sediment Trap Bottle ID: Primary Filter Sack Cylinder	Sediment Trap Bottle ID: Secondary Filter Sack Cylinder
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Total Est. Depth of Accumulated Sed in Bottle (inches): N/A	Total Est. Depth of Accumulated Sed in Bottle (inches): N/A
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Sample Processing Start Time: 0745 PST	Sample Processing End Time: 0758 PST	Sample Processing Start Time: 0748 PST	Sample Processing End Time: 0759 PST
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Number of Filters Used: 1 x P5, 5-10 µm	Number of Filters Used: Used the same filter to process residual solids (Primary & Secondary)
--	--

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~40 mL	Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~60 mL
--	--

Tare Weight [empty jar in grams (g)]: 130.5g	Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]: 130.6g
---	---

Dewatered/Filtered Sed. Weight (g): 23.7g	Dewatered/Filtered Sed. Weight (g): 19.4g
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Sample Processing Notes/Comments: Archived solids from the Filter Sack Primary Cylinder were stored in a 4 oz sample jar. Solids were removed & placed into an 8 oz sample jar for subsequent homogenizing. Rinsed & suspended residual solids from 4 oz jar & scooped & filtered residual solids. Filtered residual solids were added to 8 oz sample jar. Net loss of solids = 131.3g - 130.5g = 0.8g	Sample Processing Notes/Comments: Processed archived solids from secondary filter sack cylinder similar to primary cylinder processing. Archived solids in secondary cylinder had a higher water content than primary cylinder solids. Net loss of solids = 131.3g - 130.6g = 0.7g
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Visual Description of Final Composite Sample: **Final composite sample was primarily blackish brown in color, consisting of fine silty clay particles & fine to medium sand particles**

COC Time (time composite jar is capped): 0805 PST 6/11/09	Total Dewatered/Filtered Sed. Weight in grams (g): 41.5g	Sample Jars Collected (number, size, full or partial): 1x partial 8 oz sample jar
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Sample ID: FO095692	Duplicate sample collected? Y (N)	DUPLICATE ID
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Duplicate Sample ID on COC: FO095692	Any deviations from standard operating procedures? Y (N)	Describe:
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affix FO number	affix FO number sticker	Describe:
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Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD OPERATIONS FIELD LAB

Date 6/11/09

Subject BASEIN 18 SEDIMENT TRAP PROCESSING-18-ST1 By JXB

0710 PST - All times in PST

Setup deconed microfiltration system in order to process suspended residual solids ^{from 18-ST1} Filter Sock prototype composite. Archived solids were contained in two 4oz sample jars (1x4oz jar contained captured solids from the primary cylinder of the Filter Sock & the other 4oz jar contained solids from the secondary cylinder). Archived solids were combined into a new 8oz sample jar using a deconed stainless scoopula after taring the jar.

#1) Primary Cylinder

Weight of solids in jar w/ lid from cylinder #1 = 154.2g

Tare weight of sample jar w/ lid = 130.5g

#2) Secondary Cylinder ^{Total weight of cap. solids = 23.7g}

Weight of solids in jar w/ lid from cylinder #2 = 150.0g ^{(x) 7/8/09}

Tare weight of sample jar w/ lid = 130.6g

∴ Total weight of cap. solids = 19.4g

Tare weight of 8oz jar w/ lid = 212.6g

Net loss of solids => cylinder #1 = 0.8g cylinder #2 = 0.7g

0745- Equipped filtration system w/ a PS, 5-10um filter. Used ~40 & 60ml of WPP1 to suspend residual solids adhered to inner surfaces of the two 4oz archived sample jars & stainless scoopula. Filtered residual solids

0758 & 0759 - Residual solids filtered. ^{Scraped} Solids from filter & added to 8oz jar. Homogenized solids from 18-ST1 Filter Sock Prototype. Took photos of final composite (0341.JPG 6/11/09 0808).

Total weight of processed solids = 212.6g - 254.1g (Processed solids in 8oz jar w/ lid)

Attachments = 41.5g

0805- Capped composite jar

18-ST2

	<p>CITY OF PORTLAND</p> <p>ENVIRONMENTAL SERVICES</p> <p>Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005	
Sample Processing Conducted By: LAP	Sample Pt. Code: 18-ST2	Removal Date: 6-4-09	Processing Date: 6-8-09 to 6-9-09 ✓
Basin: 18 R&D Winter 2009 Pilot Study		Hansen ID: AAT557	Subbasin: N/A
Sediment Trap Location Description/Address: 3950 NW Yeon Ave <i>Three four different sediment trap designs were installed upstream (US) of manhole AAT557 in 42" diameter main pipe, just off of pipe invert. Standard sed trap pair installed using @original 06/07 7/8/09 anchor bolt locations approx. 5.0' US of manhole chamber 5.0' US from end of pipe (EOP). Standard pair housed @ wide-mouth & narrow-mouth bottle. A low-profile square trap was installed ~5.0' US from standard pair. A low-profile rectangular trap was installed another 5.0' US.</i>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): Fisher Scientific, qualitative P5, 5-10µm cellulose filter paper. ✓			
Sediment Trap Bottle ID: 18-ST2-B1-WM ✓		Sediment Trap Bottle ID: 18-ST2-B2-NM ✓	
Total Est. Depth of Accumulated Sed in Bottle (inches): ~0.4"		Total Est. Depth of Accumulated Sed in Bottle (inches): ~0.9" ✓	
Sample Processing Start Time: 0926 PST	Sample Processing End Time: 1059 PST ✓	Sample Processing Start Time: 1211 PST	Sample Processing End Time: 1523 PST
Number of Filters Used: (6) P5 filters ✓		Number of Filters Used: (12) P5 filters ✓	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~80 mL ✓		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~130 mL ✓	
Tare Weight [empty jar in grams (g)]: 201.8 g (w/ lid)		Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]: 210.8 g ✓	
Dewatered/Filtered Sed. Weight (g): 9.0 grams ✓		Dewatered/Filtered Sed. Weight (g): 122.4 g	
Sample Processing Notes/Comments: Solid material is primarily fine silt & clay; dark brown in color w/ a petroleum hydrocarbon odor.		Sample Processing Notes/Comments: Solid material is almost exclusively very fine silts & clay - dark brown in color.	

Visual Description of Final Composite Sample Silt/clay material; dark brown color; petroleum hydrocarbon odor. ✓		
COC Time (time composite jar is capped): 1359 PST 6/9/09	Total Dewatered/Filtered Sed. Weight in grams (g): 223.3 grams	Sample Jars Collected (number, size, full or partial): 1 jar (~3/4 full)
Sample ID: FO095693 <small>affix FO number</small>	Duplicate sample collected? Y/N <input checked="" type="radio"/> DUPLICATE ID	
Duplicate Sample ID on COC: <small>affix FO number sticker</small>	Any deviations from standard operating procedures? Y/N <input checked="" type="radio"/> Describe:	

18-ST2



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

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



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP.

Project Number: 1020.005

Sample Processing Conducted By:

LAP

Sample Pt. Code:

18-ST2

Removal Date:

6-4-09

Processing Date:

6-8-09 to 6-9-09

Basin: 18 R&D Winter 2009 Pilot Study

Hansen ID:

AAT557

Subbasin: N/A

Sediment Trap Location Description/Address:

(See Page 2 of trap location)

3950 NW Yeon Ave

7/8/09

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].

Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper):

Fisher Scientific qualitative P5, 5-10 µm cellulose filter paper.

Sediment Trap Bottle ID:

18-ST2-B3-SQ

Sediment Trap Bottle ID:

18-ST2-B4-RECT

Total Est. Depth of Accumulated Sed in Bottle (inches):

≈ 0.4"

Total Est. Depth of Accumulated Sed in Bottle (inches):

≈ 0.6"

Sample Processing Start Time:

0727 PST

Sample Processing End Time:

0956 PST

Sample Processing Start Time:

1122 PST

Sample Processing End Time:

1353 PST

Number of Filters Used:

(7) P5 filters

Number of Filters Used:

(8) P5 filters

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

≈ 60 mL

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

≈ 130 mL

Tare Weight (empty jar in grams (g)):

JAR & B1, B2 contributions = 333.2g

Tare Weight (jar and filtered sed. from Bottle 1 in grams (g)):

JAR & B1, B2, B3 contributions = 352.0g

Dewatered/Filtered Sed. Weight (g):

18.8 grams

Dewatered/Filtered Sed. Weight (g):

73.1 grams

Sample Processing Notes/Comments:

Solid material primarily consists of very fine silt material - dark brown in color.

Sample Processing Notes/Comments:

Solid material is a very fine silty/clay material. Dark brown in color w/ strong

petroleum hydrocarbon odor.

Visual Description of Final Composite Sample: Silt/clay material; dark brown color; petroleum hydrocarbon odor.

COC Time (time composite jar is capped):

1359 PST 6/9/09

Total Dewatered/Filtered Sed. Weight in grams (g):

223.3 grams

Sample Jars Collected (number, size, full or partial):

1 jar (≈ 3/4 full)

Sample ID:
affix FO num

FO095693

Duplicate sample collected? Y/N

DUPLICATE ID

Duplicate Sample ID on COC:

affix FO number sticker

Any deviations from standard operating procedures? Y/N

Describe



Page 1 of 10

Project PORTLAND HARBOR STORMWATER SAMP Project No. 1020.005
Location WPCL Field Lab Date 6-8-09
Subject Basin 18 Sed Trap Processing-18-ST2 By LAP

Time in PST *

0905: Set-up microfiltration system w/ a P5
(5-10 μ m) cellulose filter. Primed filter
w/ a small amount of ultra-pure DI
water (UPDI) to secure filter. #1.

0926: Begin to process bottle 1 of site
18-ST2-B1-WM.

0938: Filter #1 clogged - no recoverable solids.
Replaced w/ a new P5 filter &
resumed processing of supernate.

1000: Filter #2 clogged - no recoverable solids.
Replaced w/ a new P5 filter, primed
w/ UPDI & resumed processing.
Photo

1004: Filter #3 clogged - no recoverable solids.
Replaced w/ a new P5 filter, primed
w/ UPDI & resumed processing. Almost
all supernate filtered at this point.
Photographed the (3) filters used to
process most of the supernate (253.jpg).

Attachments



Page 2 of 10 ✓

Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005
Location WPCL Field Lab Date 6-8-09 ✓
Subject Basin 18 Sed. Trap Processing-18^{ST2} By LAP

1020: All water has been pulled through filter #4.
Material consists of very fine clay/silt material. Scraped into sample jar.
(Photo of Solids = 254.jpg). Installed new
✓ PS filter & primed w/ UPDI, resumed processing.

1039: All water has been pulled through filter #5.
Solids retained on filter ~~and~~ surface consists of small amounts of very fine silt & clay material - scraped into sample jar. Installed new PS filter, primed w/ UPDI & resumed processing.
Added approx. ~80 ml of UPDI to sample bottle to mobilize remaining solids.

1055: All water has been pulled through filter #6.
Solids retained on filter surface consist of small amounts of gravel & sands w/ silts & small sub-angular white material (photo # 259.jpg). Scraped ^{solids} into sample ^(x2) jar. All material from 18-ST2-B1-WM 718149 has been processed at this point (1059 PST).

Summary: (6) PS filters used; ~80 ml UPDI used
Full sample jar (w/ lid) = 210.8 g
Attachments Empty " jar (w/ lid) = 201.8 g

De-watered/Filtered Sed. weight = 9.0 grams



JXB Page 3 of 10 ✓

Project PORTLAND HARBOR STORMWATER SAMP. ^{7/18/09} Project No. 1020.005
Location WPCL Field Lab Date 6-8-09
Subject Basin 18 Sed. Trap Processing ^{18-ST2} By LAP ✓

1211: Begin filtration of 18-ST2-B2-NM using a P5 (5-10 µm) cellulose filter. Primed w/ a small amount of UPDI to secure filter #1. ✓

1223: Filter #1 clogged - no recoverable solids. Replaced w/ a new P5 filter & resumed processing of supernate. 2

1253: Filter #2 clogged - no recoverable solids. Installed a new P5 filter & resumed processing. 3

1303: ✓ Filter #3 clogged - no recoverable solids. Installed a new P5 filter & resumed processing. Supernate almost all processed @ this point. 4

1306: Filter #4 clogged - very small amounts of silt recovered from filter surface & scraped into jar. Installed a new P5 filter & resumed processing. 5

1325: Filter #5 clogged - small amount of silt material recovered from filter surface & scraped into jar. Photographed solids (275.jpg) Installed new P5 filter & resumed processing. 6

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005
Location WPCL Field Lab Date 6-8-09 ✓
Subject Basin 18 Sed. Trap Processing-18-ST2 By LAP
(JXB) 718105

Processing Comment:

Very fine silt material - dark brown in color. Material is retaining water - has a pudding-like consistency after being on filter #6 surface for 30+ minutes.

(JXB)

1406: Filter #6 clogged - recovered silt/clay material described above & scraped into jar. Installed a new P5 filter & resumed processing. ✓

1423: Filter #7 clogged - recovered silt/clay material from filter surface & scraped into sample jar. Installed new P5 filter, primed w/ UPDI & resumed processing. 7

1434: Filter #8 clogged - recovered silt/clay material & scraped into sample jar. Installed new P5 filter & resumed processing. 8

1438: Filter #9 clogged - recovered clay/silt material & scraped into sample jar. Installed new P5 filter & resumed sampling. Added approx 100 ml of UPDI to mobilize solids in sample bottle. 9

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP Project No. 1020.005
Location WPLL Field Lab ⁷¹⁸¹⁰⁹ Date 6-8-09
Subject Basin 18 Sed. Trap Processing By LAP
18-ST2

1449: Filter #10 clogged. Recovered very fine clay / silt material from filter surface - scraped into sample jar. Photographed solids (283.jpg). Installed new P5 filter; added approx 30 ml UPDi to sample bottle & resumed filtration.

LAP

1507: Filter #11 clogged. Recovered fine silt/clay material from filter surface & scraped into sample jar. Installed new P5 filter & resumed processing. Sample almost fully processed @ this point.

1523: ✓ Filter #12 has pulled all water through. 18-ST2-B2-NM has been thoroughly processed. (Scraped small amount of clay/silt material from filter into sample jar).

Summary:

(12) P5 filters used; \approx 130 ml UPDi used.

Full sample jar w/ lid
including B1 contribution = 210.8 g
Full sample jar including B2 contr. = 333.2 g
De-watered/Filtered(B2) sed weight = 122.4 g

Attachments



Page 6 of 10 ✓

Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005
Location WPCL Field Lab Date 6-9-09
Subject Basin 18 Sed. Trap Processing - 18-ST2 By LAP

7/8/09

All times in PST

0710: Set-up microfiltration station for processing of 18-ST2 B3-SQ.

Install a new P5 filter, prime w/ UPDI & begin filtering supernate. (Pre-processing photo of bottle = 285.jpg) ✓

0743: Filter #1 is clogged - no recoverable solids. Replaced w/ a new P5 filter & resumed processing. 2

0755: Filter #2 clogged - small amounts of organic debris scraped into sample jar. Installed a new P5 filter & resumed processing of supernate. 3

0823: Filter #3 clogged - no recoverable solids. Installed a new P5 filter & resumed processing. Almost all supernate has been filtered at this point. 4

0829: Filter #4 clogged - no recoverable solids. Installed a new P5 filter & resumed filtration. 5

Attachments



Page 7 of 10

Project PORTLAND HARBOR STORMWATER SAMP Project No. 1020.005
Location WPCL Field Lab ^{OKB} Date 6-9-09
Subject Basin 18 Sed. Trap Processing ²¹⁸¹⁰⁹ 18-ST2-BY LAP

0841: Filter #5 is clogged. Recovered silt material from filter surface - scraped into sample jar (photo # 286.jpg). Installed new P5 filter, primed w/ ~~50~~ ²⁰ UPDI & resumed processing.

0919: Filter #6 is clogged. Recovered dark brown silt material from filter surface - scraped into sample jar. Installed new P5 filter & resumed processing. Added approx. 60 ml UPDI to mobilize remaining solids in sample bottle.

0956: Filter #7 has pulled all water through ~~18-ST2-B3-100~~ 18-ST2-B3-SQ has been thoroughly processed at this point. A small amount of fine silt material was recovered from filter surface & scraped into sample jar.

Summary: (7) P5 filters used; ~60 ml UPDI used

Sample jar w/ B1 & B2 contributions = 333.2 grams
(w/ 100)

Sample jar w/ B3-SQ contribution = 352.0 g

Attachments

De-watered/Filtered (B3) sed. weight = 18.8 grams



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Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005

Location WPCL Field Lab Date 6-9-09

Subject Basin 18 Sed-Trap Processing By LAP
18-ST2

1118: Set-up microfiltration station for processing of 18-ST2-B4-RECT (Pre-processing photo of bottle = 290.jpg).
Install a new P5 filter, prime w/ UPDI
1122: & begin filtration.

1124: Filter #1 clogged - no recoverable solids. Installed a new P5 (5-10 μ m) filter & resume filtration of supernate.

1127: Filter #2 is clogged. Very small amounts of organic debris on filter surface - scraped into sample jar. Installed a new P5 filter & resumed processing. Supernate is almost entirely filtered at this point - supernate filtration has been very fast (≈ 10 min. elapsed time).

1140: Filter #3 clogged. Recovered ~~on~~ small amounts of organic material & silt from filter surface - scraped into sample jar. Installed a new P5 filter & resumed processing of solids. Sample has strong petroleum-hydrocarbon odor. ***

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020-005

Location WPCL Field Lab

Date 6-9-09

Subject Basin 18 Sed. Trap Processing-18-ST2

By LAP

GRB 718109

1148: Filter #4 clogged. Moderate amount of silt/clay material recovered from filter surface & scraped into sample jar. Photo of Filter #4 = 293.jpg. Installed new P5 filter, primed w/ UPDi & resumed processing. Used approx. 100 ml UPDi to mobilize solids in sample bottle.

1220: Filter #5 clogged. Silty/clay material recovered from filter surface & scraped into sample jar. Installed new P5 filter & resumed processing.

1306: Filter #6 clogged - recovered silty/clay material from filter surface & scraped into sample jar. Installed new P5 filter & resumed processing.

1320: Filter #7 clogged - recovered small amount of silt/clay material - scraped into sample jar. Installed new P5 filter & resumed proc. Added approx. 30 ml UPDi to sample bottle to mobilize solids.

1353: Filter #8 clogged - recovered small amount of silty/clay material & scraped

Attachments



Page 10 of 10 ✓

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL Field Lab

Date 6-9-09

Subject Basin 18 Sed. Trap Processing -18-ST2 LAP

(1353cont.) JXB 718109

into sample jar. 18-ST2-B4-RECT
has been thoroughly processed at this
point. ✓

Summary: (8) P5 filters used; ≈ 130 ml UPDI used

Sample jar w/ B1, B2 & B3
contributions (including lid) = 352.0 grams ✓

Sample jar including B4-RECT
(w/ lid) contribution = 425.1 g ✓

De-watered/Filtered (B4) sed. weight = 73.1 grams ✓

Final sample photo #301.jpg

(w/ lid) Full jar w/ B1, B2, B3 & B4 = 425.1 g
Empty jar (w/ lid) = 201.8 g

Total Sediment weight = 223.3 grams ✓

[1359_{PST} 6/9/09 SAMPLE COLLECTED: FINAL]

18-ST3 ✓



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

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



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP.

Project Number: 1020.005

Sample Processing Conducted By:

AJA

Sample Pt. Code:

18-ST3

Removal Date:

1/14/09

Processing Date:

6/8/09

Basin: 18 R&D Winter 2009 Pilot Study

Hansen ID: **AN0535**

Subbasin: N/A

Sediment Trap Location Description/Address: *Traps were installed upstream (US) of node AN0535 approx. 30" US from the end of pipe (EOP) in the main 42" diameter pipe. Traps were spaced approx 30" from each other.* **(JXB 7/9/09)**
4033 NW Yeon

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Standard Vacuum

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].

Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper):

Fisher Scientific, qualitative P5, 5-10 µm Cellulose Filter Paper.

Sediment Trap Bottle ID:

18-ST3-B1-NM

Sediment Trap Bottle ID:

18-ST3-B4-SQ

Total Est. Depth of Accumulated Sed in Bottle (inches): **4.9"**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~3.5"**

Sample Processing Start Time:

0932 PST

Sample Processing End Time:

1155 PST

Sample Processing Start Time:

1215 PST

Sample Processing End Time:

1310 PST

Number of Filters Used:

3 (P5 5-10 µm)

Number of Filters Used:

2 (P5, 5-10 µm)

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

75ml

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

70ml

Tare Weight (empty jar in grams (g)): Tot. = 1243.7g - 105.1g (bottle tare)

Dewatered/Filtered Sed. Weight (g): Sed wt. = **1138.6g-B1**

Tare Weight (jar and filtered sed. from Bottle 1 in grams (g)):

See green sheet pg. 5a for details
931.0g sed from B4 7/13/09

Sample Processing Notes/Comments: *J. Law, PHA, + DPL, dumped contents directly from B1 into composite bucket. Used two additional P5 filters (after initial filter) to filter residual sed and add to composite.*

Sample Processing Notes/Comments: *filter for decanted supernate and 1st aliquots of rinsed residuals; Used 2nd P5 filter to finish rinsing. Compacted sed. were transferred to composite bucket, after*

Visual Description of Final Composite Sample: *Final composite was dark brown w/ fine to medium sands, silt & clay particles w/ minor woody organic material present*

COC Time (time composite jar is capped): **6/9/09 @ 1520**

Total Dewatered/Filtered Sed. Weight in grams (g): **3860.0g**

Sample Jars Collected (number, size, full or partial): **1x full 802 + (4) 802 Archive**
6x full 402 (1) 802 Archive

Sample ID: **FO 095694**

affix FO number sticker

Duplicate sample collected? **Y/N**

DUPLICATE ID

1x full 802
6x full 402


Duplicate Sample ID on COC:

affix FO number sticker: **FO 095697**

Any deviations from standard operating procedures? **Y/N**

Describe:

18-ST3

	<p>CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET			
Project Name: <u>Portland Harbor Stormwater Samp.</u>		Project Number: <u>1020.005</u>	
Sample Processing Conducted By: <u>JJM</u>	Sample Pt. Code: <u>JXB 18-ST3-B2-WM 7/11/09</u>	Removal Date: <u>11/1/08 09</u>	Processing Date: <u>6/8/09</u>
Basin: <u>18 R: D Winter 2007 Pilot Study</u>		Hansen ID: <u>AND535</u>	Subbasin: <u>N/A</u>
Sediment Trap Location Description/Address: <u>Traps were installed US of node AND535, approximately 30" US of the 1/2" diameter inlet end of pipe (EOP) and were approximately 30" apart from each other.</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <div style="text-align: right;"><u>P5, 5-10 µm cellulose filter</u></div>			
Sediment Trap Bottle ID: <u>18 - ST3 - B2 - WM</u>	Sediment Trap Bottle ID: <u>JXB 7/11/09</u>		
Total Est. Depth of Accumulated Sed in Bottle (inches): <u>~3.4"</u>		Total Est. Depth of Accumulated Sed in Bottle (inches):	
Sample Processing Start Time: <u>1018</u>	Sample Processing End Time: <u>1043</u>	Sample Processing Start Time:	Sample Processing End Time:
Number of Filters Used: <u>2</u>		Number of Filters Used:	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>50 mL</u>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):	
Tare Weight [empty jar in grams (g)]: <u>40.5g (WM bottle) JM</u>		Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]:	
Dewatered/Filtered Sed. Weight (g): <u>652.8 JXB 7/11/09</u>		Dewatered/Filtered Sed. Weight (g):	
Sample Processing Notes/Comments: <u>Solids were compacted at bottom of bottle. Solids were mostly fine silts with medium sands and some woody debris. Solids had strong odor of decomposing woody debris. All 18-ST3 bottles composited together.</u>		Sample Processing Notes/Comments:	

Visual Description of Final Composite Sample: <u>Final composite was dark brown w/fine to medium sands, silt & clay particles w/minor woody organic material present</u>		
COC Time (time composite jar is capped): <u>6/9/09 @ 1500</u>	Total Dewatered/Filtered Sed. Weight in grams (g): <u>3860.0g</u>	Sample Jars Collected (number, size, full or partial): <u>(1) Full 802 + (4) 802 Archive (6) Full 402 + (1) 402 Archive</u>
Sample ID: <u>FO095694</u>	Duplicate sample collected? <u>Y/N</u>	DUPLICATE ID: <u>1x Full 802 6x Full 402 JXB 7/11/09</u>
Duplicate Sample ID on COC: <u>FO095697</u>		Any deviations from standard operating procedures? <u>Y/N</u> Describe: <u>JXB 7/11/09</u>

18-ST3

	<p>CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005	
Sample Processing Conducted By: JJM	Sample Pt. Code: 18-ST3	Removal Date: 11/4/09	Processing Date: 6/8/09
Basin: 18 R&D Winter 2009 Pilot Study		Hansen ID: AND535	Subbasin: N/A
Sediment Trap Location Description/Address: <i>Traps were installed US of node AND535 ~30" US of the 42" diameter inlet end of pipe (EOP) and were approximately 30" apart from each other.</i> 4033 NW Yeon DXB 7/15/09			



SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method: Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].			
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <i>Fischer scientific, qualitative P5, 5-10µm cellulose filter</i>			
Sediment Trap Bottle ID: 18-ST3-B3-RECT		Sediment Trap Bottle ID: -	
Total Est. Depth of Accumulated Sed in Bottle (inches): 2.5"		Total Est. Depth of Accumulated Sed in Bottle (inches): -	
Sample Processing Start Time: 1208	Sample Processing End Time: 1238	Sample Processing Start Time: -	Sample Processing End Time: -
Number of Filters Used: 2		Number of Filters Used: -	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): 50 mL		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): -	
Tare Weight (empty jar in grams (g)): 1501.3g		Tare Weight (jar and filtered sed. from Bottle1 in grams (g)): 1501.3g	
Dewatered/Filtered Sed. Weight (g): See 18-ST3 addendum		Dewatered/Filtered Sed. Weight (g): See 18-ST3 addendum	
Sample Processing Notes/Comments: <i>Solids were compacted at bottom of bottle. Solids were mostly fine clay and silts with medium coarse sands. Some woody leafy debris present, yet remJm mostly removed. Strong decomposing organic woody debris odor. Bottle B3 added to composite bucket</i>		Sample Processing Notes/Comments: -	

Visual Description of Final Composite Sample:

COC Time (time composite jar is capped):	Total Dewatered/Filtered Sed. Weight in grams (g):	Sample Jars Collected (number, size, full or partial):
Sample ID: affix FO number sticker	Duplicate sample collected? Y/N	DUPLICATE ID
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y/N	
Describe:		



18-ST3✓

	CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452	
INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET		
Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005
Sample Processing Conducted By: <i>JTM</i>	Sample Pt. Code: <i>18-ST3</i>	Removal Date: <i>6/4/09</i>
Processing Date: <i>6/8/09</i>		
Basin: 18 R&D Winter 2009 Pilot Study	Hansen ID: <i>AND535</i>	Subbasin: <i>N/A</i>
Sediment Trap Location Description/Address: <i>Traps were installed US of node AND535 approximately 30" US of the 1/2" diameter inlet end of pipe (EOP) and were approx. 30" apart from each other</i>		

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <i>JXB 7115109 P5, 5-10 µm qualitative cellulose filter</i>			
Sediment Trap Bottle ID: <i>18-ST3-B5-NM</i>		Sediment Trap Bottle ID: - - -	
Total Est. Depth of Accumulated Sed in Bottle (inches): <i>0.6"</i>		Total Est. Depth of Accumulated Sed in Bottle (inches):	
Sample Processing Start Time: <i>1300</i>	Sample Processing End Time: <i>1336</i> ✓	Sample Processing Start Time:	Sample Processing End Time:
Number of Filters Used: <i>2</i> ✓		Number of Filters Used:	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <i>None</i>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):	
Tare Weight (empty jar in grams (g)): <i>WM Solids + bottle = 69.7 g</i>		Tare Weight (jar and filtered sed. from Bottle1 in grams (g)):	
Dewatered/Filtered Sed. Weight (g): <i>59.1 g</i> ✓		Dewatered/Filtered Sed. Weight (g):	
Sample Processing Notes/Comments: <i>Solids were minimal, compacted at bottom of bottle. Solids were mostly fine clay and silt w/ medium coarse sands. All ST3 bottles composited into same bucket.</i>		Sample Processing Notes/Comments:	

Visual Description of Final Composite Sample:		
COC Time (time composite jar is capped):	Total Dewatered/Filtered Sed. Weight in grams (g):	Sample Jars Collected (number, size, full or partial):
Sample ID: affix FO number sticker	Duplicate sample collected? Y/N DUPLICATE ID	
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y/N Describe: <i>7</i> <i>JXB 7115109</i>	

18-ST3 ✓

	<p>CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET		
Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005
Sample Processing Conducted By: <i>ASA</i>	Sample Pt. Code: <i>18-ST3</i>	Removal Date: <i>6/4/09</i>
		Processing Date: <i>6/8/09</i>
Basin: 18 R&D Winter 2009 Pilot Study	Hansen ID: <i>AND535</i>	Subbasin: <i>N/A</i>
Sediment Trap Location Description/Address: <i>See page #1 of 6 for sed trap location & site address details</i>		
<p><i>(JXB) 7/13/09</i></p>		

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method: <i>standard w/ vacuum</i>		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <i>Fisher Scientific, qualitative P5, 5-10 µm cellulose filter</i>			
Sediment Trap Bottle ID: <i>18-ST3-B6-WM</i>		Sediment Trap Bottle ID: <i>7/13/09</i>	
Total Est. Depth of Accumulated Sed in Bottle (inches): <i>1.0"</i>		Total Est. Depth of Accumulated Sed in Bottle (inches):	
Sample Processing Start Time: <i>1345 pst</i>	Sample Processing End Time: <i>1449 pst</i>	Sample Processing Start Time:	Sample Processing End Time:
Number of Filters Used: <i>3 (P5, 5-10 µm)</i>		Number of Filters Used:	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <i>85 mL</i>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):	
Tare Weight [empty jar in grams (g)]: <i>(3 filters weighed → see pg 6a green sheets)</i>		Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]:	
Dewatered/Filtered Sed. Weight (g): <i>141.5g</i>		Dewatered/Filtered Sed. Weight (g):	
Sample Processing Notes/Comments: <i>Despite only 1.0" (as compared to 4.0+"), the vertical distribution of B6 is much like B1 + B4. Lighter, woody debris on the surface of accumulated sed with very dense, compacted clay + sand on the bottom. Filtered sample (not dumped directly into composite bucket as previously done to B1 & B4).</i>		Sample Processing Notes/Comments:	

Visual Description of Final Composite Sample:		
COC Time (time composite jar is capped):	Total Dewatered/Filtered Sed. Weight in grams (g):	Sample Jars Collected (number, size, full or partial):
Sample ID: <small>affix FO number sticker</small>	Duplicate sample collected? Y/N	DUPLICATE ID
Duplicate Sample ID on COC: <small>affix FO number sticker</small>	Any deviations from standard operating procedures? Y/N	
	Describe:	

18-ST3 ✓

	<p>CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005	
Sample Processing Conducted By: <i>JJM/AJA/JXB</i>	Sample Pt. Code: <i>18-ST3</i>	Removal Date: <i>6/4/09</i>	Processing Date: <i>6/8/09 - 6/19/09</i>
Basin: 18 R&D Winter 2009 Pilot Study		Hansen ID: <i>AND535</i>	Subbasin: <i>N/A</i>
Sediment Trap Location Description/Address: <i>Traps were installed upstream of node AND535 ~30" upstream of the 42" diameter inlet end of pipe (EOP) & were ~30" apart from each other (18-ST3-RECT & 18-ST3-SC were ~90" & 120" upstream of the EOP in AND535) 4033 NW Yeon Ave.</i>			



SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <i>Fisher Scientific, qualitative P5, 5-10 µm cellulose filter</i>			
Sediment Trap Bottle ID: <i>18-ST3-87-RECT</i>		Sediment Trap Bottle ID: <i>- - -</i>	
Total Est. Depth of Accumulated Sed in Bottle (inches): <i>~1.5'</i>		Total Est. Depth of Accumulated Sed in Bottle (inches): <i>-</i>	
Sample Processing Start Time: <i>6/8/09 @ 1414 PST JXB</i>	Sample Processing End Time: <i>6/19/09 @ 1205 PST J</i>	Sample Processing Start Time:	Sample Processing End Time:
Number of Filters Used: <i>4x P5, 5-10 µm</i>		Number of Filters Used:	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <i>~75 mL</i>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):	
Tare Weight [empty jar in grams (g)]: <i>JXB 131.1g</i>		Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]:	
Dewatered/Filtered Sed. Weight (g): <i>282.8g 347.4g</i>		Dewatered/Filtered Sed. Weight (g):	
Sample Processing Notes/Comments: <i>Solids were very compact in bottom of sed trap bottle. Processed solids were primarily fine silts & clay particles w/ fine to coarse medium sands & large organic woody debris. No visible sheen present. Sample had an organic woody odor & was blackish brown w/ red inclusions.</i>		Sample Processing Notes/Comments:	

Visual Description of Final Composite Sample:

COC Time (time composite jar is capped):	Total Dewatered/Filtered Sed. Weight in grams (g):	Sample Jars Collected (number, size, full or partial):
Sample ID: affix FO number sticker	Duplicate sample collected? Y/N	DUPLICATE ID
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y/N	
Describe:		

18-ST3

		<p align="center">CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>			
<p align="center">INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET</p>					
Project Name: PORTLAND HARBOR STORMWATER SAMP.			Project Number: 1020.005		
Sample Processing Conducted By: JXB/PTB/LAP		Sample Pt. Code: 18-ST3		Removal Date: 6/4/09	
				Processing Date: 6/9/09	
Basin: 18 R&D Winter 2009 Pilot Study		Hansen ID: AN0535		Subbasin: N/A	
Sediment Trap Location Description/Address: - See page 1 of 7 -					

<p align="center">SEDIMENT TRAP PROCESSING/FILTRATION NOTES</p>			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): Fisher Scientific, qualitative P2, 5-10 µm cellulose filter			
Sediment Trap Bottle ID: 18-ST3-B3-SQ		Sediment Trap Bottle ID: - - -	
Total Est. Depth of Accumulated Sed in Bottle (inches): 1.2"		Total Est. Depth of Accumulated Sed in Bottle (inches):	
Sample Processing Start Time: 6/4/09 @ 1320	Sample Processing End Time: 6/9/09 @ 1445	Sample Processing Start Time:	Sample Processing End Time:
Number of Filters Used: 2		Number of Filters Used:	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~100 mL		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):	
Tare Weight [empty jar in grams (g)]: 109.7g		Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]:	
Dewatered/Filtered Sed. Weight (g): 241.2g		Dewatered/Filtered Sed. Weight (g):	
Sample Processing Notes/Comments: Solids were primarily compacted fine to medium sands, silts & clay particles w/coarse large organic woody material deposited on the surface of the compacted material. Woody debris was removed; remaining dark brown solids compacted solids were added to composite.		Sample Processing Notes/Comments:	

Visual Description of Final Composite Sample		
COC Time (time composite jar is capped):	Total Dewatered/Filtered Sed. Weight in grams (g):	Sample Jars Collected (number, size, full or partial):
Sample ID affix FO number sticker	Duplicate sample collected? Y/N DUPLICATE ID	
Duplicate Sample ID on COC affix FO number sticker	Any deviations from standard operating procedures? Y/N Describe:	



Page 1a of 6A ^{8x8} 7/9/09

Project Portland Harbor Stormwater Sample
Location WPCL Field Lab/ Basin 18
Subject Basin 18 Sed trap processing - 18-ST3

Project No. 1020.005

Date 6/8/09

By AJA

*Times in PST

0912 Assembled deconned 90mm stainless/glass micro-filtration set-up to start filtration processing of site 18-ST3 (8 bottles total.) Filtration set-up deconned according to FO SOP 7.01a. Use of acetone + methanol solvent rinses based on higher priority PCB analyses. This deviation from the SOP has been documented in previous processing years (06-07, 07-08) and has been approved by the project manager, Linda Scheffler.

~~0930~~ 0932 Equipped Filtration set up with P5 (5-10 μ m) Fisher Scientific, cellulose paper filter.
Photographed sample bottle 18-ST3-B1-NM (installed 12/9/08; removed 1/14/09, 1350)
And filtered supernate.

Note that these first 4 bottles from ST3 have
A lot of compacted, clay-like seds (2.5" to 4.9" ^{severnian basin})
A discussion w/ Jason Low, Peter Abrams, and Duane Ginnette concluded that individual bottle contributions to the total mass of sediment collected will be measured in a gross manner. The weight of bottle w/ dewatered seds plus any filtered contribution minus the empty bottle weight will estimate the collected seds in each bottle. To maintain (A)

Attachments



7/13/09
Page 29 of 6A

Project Portland Harbor Stormwater Mon Samp.
Location WPCF Field Lab / Basin 18
Subject 18-ST3 Filtering notes

Project No. 1020.005
Date 6/8/09
By ASA

(cont.)

If the accumulated sed^s are fairly dry, they will be collected ~~for~~ directly into a composite vessel. The residual sed^s in the bottle will be rinsed with only one ~50ml aliquot of UPDI to maintain protocol. If a bottle has lower amounts of solids, it will be treated in a more thorough manner to capture all sediment from that bottle.

1035 Sed + bottle weight = 1004.2g + 138.1g (1st filter)
= 1142.3g tot wt sed + B1

1054 Completed transfer of solids from B1 to Composite bucket. Added ~50ml upDI to re-suspend residual solids, filtered w/ new P5 (5-10um) filter (2nd filter for this bottle)

1115 update on processing these large volume sample bottles: Pete Abrams spoke w/ Linda. The one change is that we will add however much UPDI is needed to rinse adhered solids from bottle, in order to maximize sed. capture. We will use these large amounts of sediment to complete a duplicate sample.

1120 Filter 2 dry, weighed, collected in composite bucket. Replaced filter, added ~25 ml upDI (cont)

Attachments



(JXB) 7/13/09 Page 39 of 6A

Project PDX Harbor Stormwater Samp
Location WPL Field Lab / Basin 18
Subject 18-ST3 Filtration Notes

Project No. 1020.005
Date 6/8/09
By AJA

1120 (cont) to rinse residual contents of sample bottle

Used p5 (5-10 μ M) filter.

Filter 2 tot wt = 98.0g - 2.2g (scraped filter) = 95.8g sed
filter 2

Empty Bottle wt = 105.1g

1155 Third and final filter dried.

Mass = 7.5g tot - 1.9 filter = 5.6g sed
filter 3

Material is very fine grain sand and clay particles.

Total B1 sed wt = 1142.3g Bot w/seds + 1st filter wt.
+ 95.8g filter 2

✓ 75ml total
UPDI added.

+ 5.6g filter 3
1243.7g (JXB) 7/13/09
- 105.1g empty bott.
1138.6g sed B1

1215 Renewed p5 filter (5-10 μ M), using same micro-filtration set up. Filtering 18-ST3, B4-SQ.

Took photograph. Bottle has ~4" seds in it. Upon opening, large woody chips + pieces are observed on the top of sediment. Removed, photographed, and discarded woody pieces, after filtering supernate through p5.



(JXB) 7/13/09

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Project PDX Harbor Stormwater Sump
Location WPCL Field ^{Lab} Basin 18
Subject 18-ST3 Filtration notes

Project No. 1020.005
Date 6/8/09
By AJA

(JXB) 7/13/09

(cont.)

(JXB) 7/13/09

Weights: Bottle w/o water or wood = 89.76g ^{Bott + Seds}

Discarded wood (+ Foil) = 109.1g

1240 Finish transferring solids in bottle ^(B4) to composite bucket. Seds were very compacted and dry. Consisting of mostly clays and fine sands.

Used ~25ml of UPDI to rinse accumulated residual seds from inside of B4. Added ~25ml more to continue residual ~~S4~~ ^(B4) rinses (50 ml UPDI total). Still using first filter.

1250 First filter dried, photographed twice, weighed, collected into comp. bucket.
Wt = 34.9g (seds + filter) - 1.8g filter =

Filter cake was very dried sand and 33.1g filter 1
Clay Sed wt.

1300 Replaced filter with second P5 filter for this site. used an additional ~20 ml UPDI to get last aliquot of residual solids out of B4. (70ml UPDI total)

1310 Filter 2 dry. Final Filter for B4-SQ. Very fine clay/sand particles w/ small woody debris. Weighed, composited and discarded filter.
Seds + filter = 3.8g filter = 1.8g Sed wt = 2.0g

Attachments



JXB 7/13/09

Page 5a of 6A

Project PDX Harbor Stormwater Camp
Location WPCL Field Lab / Basin 18
Subject 18-ST3 ~~filter~~ filtration notes

Project No. 1020.005
Date 6/8/09
By AJA

(1310 cont) Total wt = ² 897.6 g bottle + seeds (dewatered)
of captured solids 109.1 g discarded woody debris
JXB 7/13/09 33.1 g filter 1
2.0 g filter 2

1041.8 g Total initial solids captured by B4-SQ
-110.8 g empty bott + Bottle weight

931.0 g tot sed ^{of captured solids} Bot 4
-109.1 g discarded woody debris
Total Contribution of processed solids from B4-SQ in composite = 821.9 g

1345 Photographed 18-ST3-B6 WM. Renewed P5
Filter (5-10 μ m).

Despite only having ~1.0" ^{JXB 7/13/09} accumulated sediment, the vertical profile of the bottle is very similar to the previous bottles, which had a lot of sed (73") On the top of the accumulated ~~sed~~ ^{sed in B6-WM} was larger woody debris underneath was highly impacted clay and fine sand. Due to its small amount, the woody debris will be included in the composite.

WT Filter + seeds = 70.3g - 2.1g filter =
photographed filter, added to [68.2g sed]
Composite bucket.

1410 Renewed P5 Filter (5-10 μ m) 2nd filter for this
bottle. Added ~50 ml HPDI to re-suspend
adhered solids.

Attachments



(JXB)

Page 6a of 6a

Project PDX Harbor Stormwater Samp 7/13/09
Location ^{wpc} Field Lab / Basin 18
Subject 18-ST3 filtration notes

Project No. 1020.005
Date 6-8-09
By ASA

1433 Filter #2 dry. Photographed, weighed, composited.
Again soil is very fine grained with organic
woody inclusions.

Filter + seds = 61.4 g

Filter = 2.2 g

59.2 g Filter 2

1440 Replaced filter w/ another P5 (5-10 µm)
filter paper. Used an additional 35 ml UPDI
to rinse bottle residuals (85 ml UPDI total)

1449 Filter dry. Bottle 6 complete. Composited filter

Filter + Sed wt = 16.3 g

Filter wt = 2.2 g

Seds = 14.1 g Filter 3

(JXB)
7/13/09

Total seds collected from B6 = 68.2 g Filter 1

59.2 g 2

14.1 g Filter 3

141.5 g from B6 //



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Project Portland Harbor Stormwater Samp
Location WPCL Field Operations Field Lab
Subject Basin 18 Sediment Trap Processing - 18-ST3

Project No. 1020-005
Date 6/8/2009 - 6/9/09
By JTM

0953 PST (All times in PST)

Assembled decontaminated 90 mm stainless/glass micro filtration apparatus for filtration/processing of site 18-ST3 (8 bottles total). Decontamination per F.O. SOP 7.01 g, use of acetone and methanol solvent rinses based on higher priority PCB analysis. This deviation from the SOP has been documented in previous processing years (06-07-08) and has been approved by the project manager Linda Scheffler.

*18-ST3-B2-WM → ~~decontaminated~~

1006 Equipped filtration apparatus with P5 (5-10 μm) Fischer Scientific, cellulose filter paper.
Photographed sample bottle 18-ST3-B2-WM (installed 12/9/08, removed 1/14/09)

1018 Filtered supernatant^{JTM} which removed bulky sticks and floatable woody leafy debris. Weight of removed floatables + P5 filter paper 12.6 grams *

* Weight of composite bowl for site 18-ST3^{processing} (all 8 bottles) = 1065.1g
Weight of composite spoons (2) = 161.1g
Weight of bottle 18-ST3-B2-WM (sans supernatant) = 746.9g
Weight of leafy woody debris physically removed w/ spoon = 25.7^{JTM} 36.3g

1043 Emptied solids from B2^{directly} into composite bowl. Added 50 mL of ultra pure DI to bottle to facilitate removal of remaining solids adhering to inner surfaces. Filtered w/ P5 (some sed. remaining in bottle, minimal).
Weight of 2nd filter paper (solids suspended in 50 mL UPDI) = 7.1g *
Weight of cleaned 18-ST3-B2-WM bottle (after drying) = N/A JTM

Attachments

* Approximate tare weight of blank wet P5 filter = 1.8g ∴ weight of solids from Filter #1 = 0.8g
weight of solids from Filter #2 = 5.3g

JXB
7/14/09



Page 2 B of 2B9B

Project Portland Harbor Stormwater Sampling ^{5x2} _{7/11/09} Project No. 1020.005
Location WRCL Field Operations Field Lab Date 6/8/2009
Subject Basin 16 Sediment Trap Processing - 18-ST3 By JTM

1108 Captured photos of 1st & 2nd filter papers and removed woody, leafy debris. The second filter paper solids ^{vegetation} scraped into composite bowl.

bottle
1113 Weight of 18-ST3-B2-WM (w/ some minimal solids, sands and leafy debris adhering to inner walls) = 94.9g
Weight of cleaned 18-ST3-B2-WM = 90.5g
Approximate loss due to adherence = 4.4g

*18-ST3-B3-RECT → see Addendum

1200 Photographed bottle 18-ST3-B3-RECT against dry erase board. Rinsed filtering apparatus with Ultrapure DI. Per ATA advice, did not decontaminate filtering equipment in between bottle B2 & B3 as samples theoretically consist of the same sample; same site.

1208 ^{JTM} Peured supernatant into apparatus and filtered through P5 (5-10µm) Fischer Scientific cellulose filter paper.
Weight of 1st filter paper = 7.0g*. Solids on paper consist primarily of woody, leafy debris and larger, angular gravels.
Weight of removed woody, leafy debris settled on surface of sediment in bottle = 31.2g ; ^{36.4g (SRB) 7/21/09} 38.2g woody, leafy debris in total.

1230 Dumped sediment from B3 into composite bowl. Added 50 mL UPDI to bottle in an attempt to re-suspend solids adhering to inner walls.
Poured 50 mL UPDI/suspended solids on 2nd piece of P5 filter paper.
Weight of 2nd filter pad (w/ re-suspended solids) = 17.2g*
Weight of 18-ST3-B3-RECT (bottle w/ minimal remaining solids) = 135.6g v
Weight of 18-ST3-B3-RECT (after cleaning) = 131.1g v

Attachments Approximate weight of lost solids due to adherence = 4.5g v

^{5x2} _{7/15/09}
* Approximate tare weight of blank wet P5 filter = ~1.8g
• weight of solids from filter #1 = 5.2g
• weight of solids from filter #2 = 15.9g



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Project Portland Harbor Stormwater Samp.

Project No. 1020.005

Location WPCL Field Operations Field Lab

Date 6/8/09

Subject Basin 18 Sediment Trap bottle processing-18-ST3

By JTM
(JKA) 7/15/09

1238 Added solids on 2nd filter paper to composite bowl. Captured photo of filter pads (1st & 2nd) and removed woody debris.

18-ST3-B5-NM

1300 Rinsed filtering apparatus with UPDI. Equipped apparatus w/ P5 Fischer Scientific, cellulose filter pad. Poured supernate from bottle leaving approximately 100ml to assist in re-suspending solids packed at the bottom of bottle and adhering to sides.

Weight of 1st filter pad = 1.8g *No recoverable solids. Tare weight of blank wet filter = ~1.8g

Equipped apparatus w/ second filter pad, agitated 18-ST3-B5-NM to re-suspend solids. Mixture poured over 2nd filter pad.

Note: Total weight of solids minus supernate + bottle = $573.4g + 104.0g = 677.4g$

1336 Filtration complete. Captured photo of 2nd filter pad w/ solids cake.

Weight of second pad w/ solids = 60.9g. Filter tare weight = 1.8g = 59.1g

Added solids cake from B5 to composite bowl.

Weight of 18-ST3-B5-NM (bottle only, w/ minimal solids adherence) = 106.4g

Weight of 18-ST3-B5-NM (after rinsing clean) = 104.0g

Approximate loss of solids due to adherence = 2.4g

18-ST3-B7-RECT

1414 Rinsed filtering apparatus w/ UPDI. Captured photo of 18-ST3-B7-RECT. Poured supernate from bottle, leaving some fluid to assist in re-suspending solids packed against bottom and adhering to sides. First filter pad is P5 (5-10um) as used in previous filtering processes today.

Weight of 1st filter pad = 1.8g *No recoverable solids. Tare weight of blank wet filter = ~1.8g

1428 Agitated bottle to re-suspend solids. Poured ~200ml of mixture on second P5 filterpad for filtration.

Weight of 2nd filter pad = 46.2g - 1.8g = 44.4g

Attachments



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Project Portland Harbor Stormwater Samp. ^(JXB) 7/15/09 Project No. 1020.005
Location WPCL Field Operations Field Lab Date 6/8/09
Subject Basin 18 Sed. Trap Bottle Processing-18-ST3 By JJM

1440 Equipped apparatus with third filter pad. ~~Beck~~^{JXB}™ Poured approximately 100 mL onto filter.

Weight of 3rd filter pad = 7.0g. ^{Tare weight of blank wet filter} - 1.8g = 5.2g

Captured photo of filter pads 1-3.

1505 Added filter pad cake from 2nd & 3rd pads to composite bowl.

Remaining Solids will be processed on 6/9/09 ^(JXB)

7/15/09

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP. ^{JXB} 7/20/09 Project No. 1020.005
Location WPCL FIELD OPERATIONS FIELD LAB Date 6/8/09 - 6/9/09
Subject BASIN 18 SEDIMENT TRAP PROCESSING - 18-ST3 By JXB

0910 PST (All times in PST)

Removed lab-grade Peralfa film & aluminum foil from microfiltration system, which was initially used to process 18-ST3-B7-RECT sed trap bottle ^{starting} on 6/8/09. (Filtration system was closed off to the Lab's atmosphere overnight & will be used to process ^{all} remaining supernate & captured solids from 18-ST3-B7-RECT). Equipped filtration system w/ a new PS, 5-10 μ m qualitative filter. Primed cellulose filter w/ UPDI. Processed remaining supernatant.

Tare weight of ^{blank} wet filter
(wet weight of PS filter(t) UPDI) = ~1.8g

1020 - Filter clogged. Approx. weight of spent filter & trace solids on surface of filter was = ~1.8g. No recoverable solids. Removed filter & equipped filtration apparatus w/ another PS, 5-10 filter. Processed remaining supernatant.

(JXB) 7/20/09

1045 - Clogged ^{filter} ~~sediment~~ filter. Trace recoverable solids on surface of filter.

Weight of spent filter(t) retained solids = ~2.3g.

Tare weight of wet filter = 1.8g

Retained solids = ~0.5g
on surface of
spent filter

∴ Approx weight of
retained solids on surface
of filter #2 = ~0.5g

(JXB) 7/20/09

Removed spent filter. Equipped system w/ new PS filter. Primed filter & processed the rest of the supernatant.

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WPCL FIELD OPERATIONS FIELD LAB

Date 6/8/09 - 6/9/09

Subject BASIN 18 SED TRAP PROCESSING - 18-ST3

By JXB

1100 - Filter clogged. Retained solids on surface of filter # 3 primarily consist of fine silts & clay particles w/ small woody organic material. Took a photo of retained/processed solids on filter # 3 (0288.jpg).

Spent filter weight (+) recoverable solids = ~2.8g

Tare weight of wet filter = 1.8g

Filter # 3 Recovered solids = 1.0g

Removed spent filter from filtration system. Massed total solids (precipitate) remaining in sed trap bottle 18-ST3-B7-RECT w/ bottle lid.

Emptied solids from B7 into composite bucket using a long stainless spatula.

Total gross weight of solids

in bottle 18-ST3-B7-RECT = 430.3g

w/ cap (minus supernate)

Remaining solids were primarily fine silts & clay particles w/ fine sands & large coarse woody particles. Solids in bottom of sed trap bottle were very compact & dense. Selectively removed large organic woody debris from subsample material prior to emptying bottle into composite bucket.

Weight of woody, leafy debris removed from subsample = 14.8g

1125 - Equipped filtration system w/ a P5, 5-10 um filter. Primed filter.

Added ~75 mL of UPDI to sed trap bottle B7-RECT to resuspend residual solids adhered to ^{inner} ~~inside~~ surfaces of bottle. Filtered solids.

Trace solids left on inner ^{inner} ~~inside~~ surfaces of bottle.

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WPCL FIELD OPERATIONS FIELD LAB

Date 6/8/09 - 6/9/09

Subject BASIN 18 SED TRAP PROCESSING - 18-ST3 By JXB

1139 - Took a photo of spent filters ~~#1, #2, #3~~ ^{#4, #5, #6} w/retained solids, used to process supernate, and removed woody, leafy debris. Scraped solids from surfaces of filters ~~#2, #3~~ ^{#4, #5, #6} then added solids to composite bucket (0292.jpg). JXB 7/20/09

1200 - Took a photo of filtered, remobilized solids on surface of filter ~~#7~~ ^{#9} (0294.jpg). Captured solids were primarily fine silts & clay particles w/ fine coarse sands & some organic woody particles. Scraped solids into composite bucket. JXB 7/20/09

Total weight of spent filter (+) processed solids = 12.2g

Tare weight of wet filter = 1.8g

10.4g Filter #9 Recovered Solids

1205 - Finished processing 18-ST3-B7-RECT

Total gross weight of solids in 18-ST3-B7-RECT = 430.3g

(solids + bottle + cap)
only minus supernatant

Weight of 18-ST3-B7-RECT = 134.0g (-) Weight of 18-ST3-B7-RECT w/cap = 131.8g
(bottle only w/cap & residual) (rinsed & dried clean)

$\Rightarrow 134.0g - 131.8g = 2.2g$ Approximate loss of solids due to adherence

Gross wet weight of solids in 18-ST3-B7-RECT

14.8g woody solids removed

430.3g

- 131.8g

298.5g

299.8g

Supernate filtration - 1.5g Total solids retained on filters #2 & 3

300.3g

Total gross wet weight of processed = 300.3g (-) Total gross weight of solids lost = 17.7g

Attachments Solids from 18-ST3-B7-RECT

300.3g

\Rightarrow

282.6g

- 17.7g 2.4

Total wet weight of processed solids for 18-ST3-B7-RECT = 282.6g JXB 7/20/09



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Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WRL FIELD OPERATIONS FIELD LAB

Date 6/8/09 - 6/9/09

Subject BASIN 18 SEDIMENT TRAP PROCESSING - 18-ST3 By JXB

1315 All times in PST

(JXB) 7/21/09

Equipped microfiltration system w/ a P5, 5-10 um qualitative cellulose filter. Primed filter w/ UPDI. Will use the same filtration apparatus employed by AJA to process other 18-ST3 sed traps. Filtration system was covered w/ aluminum foil & lab grade Perafilm overnight in order to close system off from the Lab's atmosphere. Filtration system was not decanned between bottles because all solids being processed will be incorporated in the final composite for 18-ST3.

1320 - Began processing 18-ST3-B8-SQ sed trap bottle supernatant after taking a photo adjacent to the dry erase board. 18-ST3-B8-SQ bottle was deployed between 1/14/09 to 6/4/09 w/ an observed total solids accumulation of ~1.2" (0296.jpg & 0297.jpg)

Tare weight of spent wet filter = 71.8g
^{blank}
(wet weight of P5 filter + UPDI)

1335 - Processed all supernate from 18-ST3-B8-SQ sed trap bottle. minor solids retained on surface of filter. Captured photo of spent filter w/ minor solids (0299.jpg). No recoverable solids. Wet weight of spent filter w/ minor solids = ~1.8-1.9g. Removed spent filter.

Total gross weight of solids in bottle = 389.8g

18-ST3-B8-SQ w/ cap
(minus supernatant)

Attachments



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Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WPCL FIELD OPERATIONS FIELD LAB

Date 6/8/09-6/9/09

Subject BASIN 18 SEDIMENT TRAP PROCESSING - 18-ST3 By JXB, PTB

1351-Removed large woody material off surface of compacted sediments in base of bottle. Weight of material removed 33.3g. Sample has no discernible odor, other than natural organics. Photo taken of compacted surface inside of bottle (0305.jpg). Emptying all of remaining material in bottle into composite bucket. Material is compacted fine to medium sands, silt and clay particles and small woody organic debris. Photo of removed large woody material (0306.jpg)

1407-Used ~100ml UPDI water to resuspend material adhered to walls of bottle. Equipped system with new P5 (5-10um) filter and processed remaining solids with the new UPDI.

Bottle 18-ST3-BB-SQ with cap and trace solids 115.3g

JXB 7/21/09

Tare-weight of empty bottle used for 18-ST3-BB-SQ 109.7g w/ cap. (Bottle was rinsed, cleaned and dried)

5.6g residual solids lost in processing

Weight of final sediment accumulation on wet filter 13.8g

1445- Finished filtration. Weighed accumulated material and added to 18-ST3 composite bucket. Photo of spent filter with solids (0307.jpg). Added solids homogenized into bucket. Weighed bucket with solids.

Bucket + two spoons (1 large (small) + homogenized composite 5.13kg)

Photo of homogenized composite (0308.jpg)

1500-Filled sample jars for 18-ST3 composite and the duplicate, starting with the 8 oz jars, and alternating scoops from the bucket into 18-ST3 and duplicate jars, then moving to (12) 4 oz. jars using the same filling method. 1 8 oz. jar and 6 4 oz jars for each the 18-ST3 Composite and duplicate in total. Excess material in composite bucket

PTB added to used to fill (4) 8 oz. ARCHIVE and (1) 4 oz. ARCHIVE jars.

Sample jars placed in fridge. Weight of empty bucket with solids

Attachments residue and two spoons (1 large (small) 1.27kg Photo (0309.jpg)



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WRL FIELD OPERATIONS FIELD LAB

Date 7/21/09

Subject B-ST3 SED. TRAP PROCESSING ADDENDUM

By JXB

*B-ST3-B3-RECT

Note: The ^{total} mass (captured solids minus supernate) of B-ST3-B3-RECT sed trap bottle was not documented during the ^{initial} filtration process. Therefore, the total solids contribution ^{of B-ST3-B3-RECT} to the overall composite for B-ST3, was back-calculated using the total gross processed wet weight of the composite, based on the ^{total} contributions from the other B-ST3 sed trap bottles (B1, B2, B4, B5, B6, B7, B8).

B Sed Trap Prototypes - B-ST3

Total Processed Solids Contributions - Filtered

Net Weights (g):

B1-WM = 1138.6g

B2-WM = 652.8g

B4-SQ = 821.9g

B5-WM = 59.1g

B6-WM = 141.5g

B7-RECT = 347.4g

B8-SQ = 241.2g

+ _____

3402.5g

Filtered Solids Contribution

from B-ST3-B3-RECT = 3903.8g

to total composite = 3402.5g

+ 501.3g

% Based on Filtration notes

an additional 40.9g of woody =>

material was discarded from B-ST3-B3-RECT contribution

Total Solids
Captured
by bottle
= 542.2g

B-ST3 Gross composite weight = 5.13 kg / 5130 g

(Filtered Solids + stainless bucket + 2x mixing spoons)

B-ST3 Gross composite Weight = 5130 g



minus bucket & mixing spoons = 1226.2g

Attachments

3903.8g (-) 43.8g residual material lost in composite bucket

*B-ST3 Total solids submitted for analysis = 3860.0 g

18-ST4



	<p>CITY OF PORTLAND</p> <p>ENVIRONMENTAL SERVICES</p> <p>Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET			
Project Name: PORTLAND HARBOR STORMWATER SAMP.		Project Number: 1020.005	
Sample Processing Conducted By: LAP AJA	Sample Pt. Code: 18-ST4	Removal Date: 6-4-09	Processing Date: 6-10-09
Basin: 18 R&D Winter 2009 Pilot Study		Hansen ID: AAT 466	Subbasin: N/A
Sediment Trap Location Description/Address: 4033 NW Yeon Ave			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): Fisher Scientific, qualitative P5, 5-10 µm cellulose filter paper			
Sediment Trap Bottle ID: 18-ST4-B1-RECT		Sediment Trap Bottle ID: 18-ST4-B2-WM	
Total Est. Depth of Accumulated Sed in Bottle (inches): 2.0"		Total Est. Depth of Accumulated Sed in Bottle (inches): ~0.3"	
Sample Processing Start Time: 0900 PST	Sample Processing End Time: 1116 PST	Sample Processing Start Time: 1211 PST	Sample Processing End Time: 1249 PST
Number of Filters Used: (8) P5 filters		Number of Filters Used: (1) P5 filter	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~140 mL		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): ~50 mL	
Tare Weight (empty jar in grams (g)): 308.3g (w/ lid)		Tare Weight (jar and filtered sed. from Bottle1 in grams (g)): 668.6g (w/ lid)	
Dewatered/Filtered Sed. Weight (g): 360.3 grams		Dewatered/Filtered Sed. Weight (g): 15.3 g	
Sample Processing Notes/Comments: Material primarily consists of very fine silt & organic material.		Sample Processing Notes/Comments: Filtering was very fast - only one filter used. Solids consist of sands, silt & some organic material.	

Visual Description of Final Composite Sample: SEE PAGE 2 OF 2 INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET		
COC Time (time composite jar is capped): 1315	Total Dewatered/Filtered Sed. Weight in grams (g): 492.3g (w/ lid)	Sample Jars Collected (number, size, full or partial): (1) 16oz jar, 3/4 full
Sample ID: FO095695 <small>affix FO number</small>	Duplicate sample collected? Y (N) DUPLICATE ID	
Duplicate Sample ID on COC: — <small>affix FO number sticker</small>	Any deviations from standard operating procedures? Y (N) Describe:	

18-ST4

	CITY OF PORTLAND ENVIRONMENTAL SERVICES <small>Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</small>		
	INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET		
Project Name: <u>Portland Harbor Stormwater Sam</u>		Project Number: <u>6020.005</u>	
Sample Processing Conducted By: <u>AJA / LAP</u>	Sample Pt. Code: <u>18-ST4</u>	Removal Date: <u>6/4/09</u>	Processing Date: <u>6/10/09</u>
Basin: <u>18 R4D Winter 2009 Pilot</u>		Hansen ID: <u>AAT 466</u>	Subbasin: <u>N/A</u>
Sediment Trap Location Description/Address: <u>4033 NW Yeon Ave</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <u>Fisher Scientific, qualitative, P5 5-10µm cellulose filters</u>			
Sediment Trap Bottle ID: <u>18-ST4-B3-SQ</u>		Sediment Trap Bottle ID: <u>18-ST4-B4-NM</u>	
Total Est. Depth of Accumulated Sed in Bottle (inches): <u>0.2"</u>		Total Est. Depth of Accumulated Sed in Bottle (inches): <u>1.0"</u>	
Sample Processing Start Time: <u>0941</u> <u>pst</u>	Sample Processing End Time: <u>1010</u> <u>pst</u>	Sample Processing Start Time: <u>1020</u>	Sample Processing End Time: <u>1235</u>
Number of Filters Used: <u>1</u> <u>P5 (5-10µm)</u>		Number of Filters Used: <u>5</u> <u>(P5 5-10µm)</u>	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>60ml</u>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>90ml</u>	
Tare Weight [empty jar in grams (g)]: <u>215.6g</u> <small>weight of jar + B3 sed</small>		Tare Weight [jar and filtered sed. from Bottle] in grams (g): <u>328.6g</u> <small>weight of jar + B4 sed</small>	
Dewatered/Filtered Sed. Weight (g): <u>3.5g</u>		Dewatered/Filtered Sed. Weight (g): <u>113.0g</u> <u>B4</u>	
Sample Processing Notes/Comments: <u>Used only One P5 Filter. Trace, (0.2") amount of accumulated sed made for a very easy filtration, Sandy, Silt w/ some small woody inclusions.</u>		Sample Processing Notes/Comments: <u>Filtered all supernate through first filter plus some of sediment slurry. Used 4 more filters (5 total) for remaining slurry & fines. Silt + Clay w/ sandy component, quite dry sample.</u>	

Visual Description of Final Composite Sample: <u>Dark brown, clay/silt mixture w/ fine grained sand throughout. Odor present - Decomp. organics + some hydrocarbons</u>		
COC Time (time composite jar is capped): <u>1315</u>	Total Dewatered/Filtered Sed. Weight in grams (g): <u>492.2g</u>	Sample Jars Collected (number, size, full or partial): <u>1-16oz 3/4 full</u>
Sample ID: <u>FO095695</u>	Duplicate sample collected? <u>Y/N</u> <u>DUPLICATE ID</u>	
Duplicate Sample ID on COC: <u> </u>	Any deviations from standard operating procedures? <u>Y/N</u> <u> </u>	
Describe:		



Page 1 A of 4 A *11/10/09*

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL Field Lab

Date 6-10-09

Subject Basin 18 Sed. Trap Processing

By LAP

Time in PST

Set up microfiltration system for processing of 18-ST4-B1-RECT. Photographed sample bottle pre-processed (310.jpg)

0900: Install new P5 (5-10 μ m) filter & begin processing of 18-ST4-B1-RECT.

0911: Filter #1 clogged - no recoverable solids. Installed new P5 filter & resumed processing of supernate.

0920: Filter #2 clogged - very small amounts of silt & organic material recovered from filter surface - scraped into sample jar. Installed new P5 filter, primed w/ UPDI (ultra-pure di water) & resumed filtration.

0931: Filter #3 clogged - small amounts of silt & organic debris recovered from filter surface & scraped into sample jar. Installed new P5 filter & resumed processing.

Attachments



Page 2 A of 4 A Revised
PFB

Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005
Location WPCL Field Lab Date 6-10-09
Subject Basin 18 Sed. Trap Processing By LAP

0950: Filter # 4 clogged. Large amount of clay, silt & organic material recovered from filter surface. Numerous small red worms observed (sp. tubifex tubifex?). Installed new P5 filter & resumed processing of solids.

1000: Filter # 5 clogged. Large amount of silt & organic material recovered from ^(scraped into sample jar) filter surface (photo # 316.jpg). Installed new P5 filter & resumed processing.

1011: Filter # 6 clogged. Recovered large amount of silty, organic material, dark brown in color, from filter surface - scraped into sample jar. Installed new P5 filter & added approx 120 ml UPB_i to sample bottle to mobilize remaining solids.

1040: Filter # 7 clogged. Recovered moderate amount of silt material w/ some fine sands from filter surface - scraped into sample jar. Installed new P5 filter & resumed processing. Added an additional 20 ml UPB_i to sample bottle to mobilize solids.

Attachments



Page 3 A of 4 A

Project PORTLAND HARBOR STORMWATER SAMP
Location WPCL Field Lab
Subject Basin 18 Sed. Trap Processing

Project No. 1020 005
Date 6-10-09
By LAP

1114: Filter #8 clogged. Removed small amount of ~~silt~~ silt from filter surface - scraped into sample jar.

1116: Processing of 18-ST4-B1-RECT is complete.

Summary: (8) P5 filters used; ~140 ml UPDI used

Weight of empty jar w/ lid = 308.3 grams

Weight of jar including (B1)
contribution = 668.6 g

Total de-watered/Filtered weight
of (B1) Solids = 360.3 grams

* Photo of Filtrate 18-ST4-B1-RECT
compared with 18-ST4-B4-NM filtrate
(325.jpg)



Page 4A of 4A

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL Field Lab

Date 6-10-09

Subject Basin 18 Sed. Trap Processing

By LAP

1200: Set up microfiltration system for
18-ST4-B2-WM. Installed new P5
(5-10 μ m) filter, primed w/ UPDI.

1211: Begin processing supernate. Photo of sample bottle
prior to processing 326.jpg

Added approx - 50 ml UPDI to ~~mobitron~~
sample ^{bottle} ~~jar~~ ^{to mobilize} solids. (Filtering
has gone very fast - will only use
one filter for whole sample bottle).

Photo #328.jpg. Recovered fine sands, silt &
some organic material from filter - scraped into jar.

1249: Processing of 18-ST4-B2-WM is
complete at this point.

Summary: (1) P5 filter used; \approx 50 ml UPDI used

Weight of jar including lid +
B1 & B2 contribution = 683.9 g

Weight of jar (+ lid) w/
B1 contribution = 668.6 g

Total de-watered/filtered weight of
(B2) Solids = 15.3 g

* Refer to AJA's notes, page 3B, for further compositing
Attachments information



7/24/09

Page 16 of 46 7/24/09 MB

Project Portland Harbor Stormwater Sump
Location WPCL Field Lab / Basin 18
Subject Filtration notes 18-ST4-B3/B4

Project No. 1020.005
Date 6/10/09
By AJA

*Times in PST.

0929 In WPCL to filter 18-ST4-B3 + B4. (LAP is concurrently filtering B1 + B2) Set up 90 mm ss/glass microfiltration ~~setup~~ apparatus. Everything deconned to SOP 701a methods. Deviation occurred in the form of solvent rinses (Acetone → methanol) which has been documented in past processing efforts and is known to customer Linda Sheffield.

0941. (314.JPG) Photographed Bottle 18-ST4-B3-SQ. Poured contents into filtration apparatus using new P5 (5-10 µm) cellulose filter paper. Entire contents of bottle fit through one filter. Used ~60 ml UPDI to rinse residual seeds from inside walls of bottle and filter cap.

1010 Filter clogged - only one (1) filter used for entire B3 sample. Photographed 317.JPG. Sample composed of fine grained silt + seeds with coarse inclusion, both organic and inorganic. Composited into empty tared 802 Amber Jar.
$$\begin{array}{r} 215.6 \text{ g} = \text{Tared Jar} + \text{B3 seeds} \\ - 212.1 \text{ g} = \text{Tared Jar} \\ \hline 3.5 \text{ g seeds B3} \end{array}$$

Attachments



JNB

Page 26 of 46 1/27/09

Project Portland Harbor Stormwater Sump
Location WPCL Field Lab / Basin 18
Subject 18-ST4 Filtration notes

Project No. 1020.005
Date 6/10/09
By AJA

1020 Photographed bottle 18-ST4-B4 NM (319.JPG)
Renewed P5 filter, begin filtering sample

1027 Filter 1 dry. Fine seds/silt/clay w/ some
organic woody material (small) and a red
worm. Photographed 320.jpg Composited, and
renewed P5 filter (2nd)

1033 Filtering a slurry of seds and ^{residual} supernate water.
Slow going from here on out.

1038 Filter 2 dry. Fines composited seds into sample
jar. Renewed filter with 3rd P5 (5-10 μ m)
filter continued filtering.

1050 Filter 3 dry. Sed cake ^{composed of} very fine silts clay
and fine grain sands composited, replaced
filter with 4th P5 (5-10 μ m) filter
continued filtration

1120 Filter 4 dry, photographed (322.JPG)
composited and renewed filter (P5, 5-10 μ m)
continued filtration (5th filter)
Used 50 ml MPDI to rinse inside of
bottle

1150 Used ~40 ml more MPDI (90ml total) to
rinse sides of bottle and filtration cap.

1235 Fifth filter dry Silty, sandy, with very small
woody debris on top. Photographed 329.jpg Composited
and discarded filters

Attachments



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Project Portland Harbor Stormwater Samp
Location WPCL Field Lab / Basin 18
Subject 18-ST4 Filtration Notes

Project No. 1020.005
Date 6/10/09
By ASA

1235 cont Final wt Jar + B3+B4 = 328.6 g
Jar + B3 = 215.6 g
B4 seeds = 113.0 g

As per convo with PTB + PHA, will composite seeds from B3 + B4 (currently in an 8oz jar) into the 16oz jar that already contains B1 + B2 seeds (B1 = 360.3g, B2 = 15.3g from LAP). Composite of all 4 Bottles will be homogenized in this 16oz jar, stored in the fridge until analyte priorities are sorted out by PHA.

Photographed the two subcomposites (B1+B2 and B3+B4) prior to final composite (330.1pg)
B1 + 2 sub composite considerably better than B3+4 sub composite.

Composited the 8oz jar (B3+4) into the 16 oz jar, photographed. 331.1pg
Final comp is a very dark brown clay/silt mixture with fine grained sands throughout. Odor is strong decomposing organics with slight hydrocarbon odor.

1315. Final Composite capped for refrigerated storage.



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7/22/09
PJB

Project Portland Harbor Stormwater Sam
Location WPCF Field Lab / Basin 18
Subject 18-ST4 Filtration Notes + Compositing Notes

Project No. 1020-005
Date 6/10/09
By AJA

B15 cont

Final B1,2,3,4 Comp wt = 800.5 g total

- 308.3 g jar tare

492.2 g sed total


ST4

Note that during Final Compositing, some seds which were adhered to the bottom of the Filtration funnel cup were added to the overall final Composite. (Maybe 0.5 g.) These were otherwise unaccounted for, but probably came from B4.

Final wt of 8oz jar = 212.5 g

tare wt = 212.1 g



Seds lost during Comp = 0.4 g (from B3+B4)

	<p>CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452</p>	
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INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET			
Project Name: <u>Portland Harbor Stormwater Samp</u>		Project Number: <u>1020-005</u>	
Sample Processing Conducted By: <u>PTB</u>	Sample Pt. Code: <u>18-ST5</u>	Removal Date: <u>6/4/09</u>	Processing Date: <u>6/10/09</u>
Basin: <u>18 R&D winter 2009 Pilot</u>	Hansen ID: <u>AAX 261</u>	Subbasin: <u>NA</u>	
Sediment Trap Location Description/Address: <u>3250 NW St. Helens Road</u> <u>4 different sediment trap designs installed upstream of manhole AAX 261 in 36" diameter pipe.</u> <u>1st sed trap pair installed ~5.0' upstream from MH chamber, 2nd pair is low-profile square trap, ~5.0' upstream</u> <u>(wide narrow mouth bottles) from this bottle is low-profile rectangular trap.</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <u>Fisher Scientific, qualitative P5 5-10.4µm cellulose filter paper</u>			
Sediment Trap Bottle ID: <u>18-ST5-B1-WM</u>		Sediment Trap Bottle ID: <u>18-ST5-B2-NM</u>	
Total Est. Depth of Accumulated Sed in Bottle (inches): <u>Trace</u>		Total Est. Depth of Accumulated Sed in Bottle (inches): <u>0.5</u>	
Sample Processing Start Time: <u>0924 PST</u>	Sample Processing End Time: <u>0935 PST</u>	Sample Processing Start Time: <u>0950</u>	Sample Processing End Time: <u>1047</u>
Number of Filters Used: <u>1 P5 (A)</u>		Number of Filters Used: <u>4 P5 (A)</u>	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>50 mL</u>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>50 mL</u>	
Tare Weight [empty jar in grams (g)]: <u>200.8g</u>		Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]: <u>202.2g</u>	
Dewatered/Filtered Sed. Weight (g): <u>1.4g</u>		Dewatered/Filtered Sed. Weight (g): <u>23.8g</u>	
Sample Processing Notes/Comments: <u>Only 1 filter used. Trace solids in bottle filtered quickly with only 50 ml of UPDI water used to gather solids off walls. Supernate clear.</u> <u>Easy filtration.</u>		Sample Processing Notes/Comments: <u>4 filters used. Solids recovered are fine silts and sands, w/ minimal organic content. Supernate had strong decomposing organic smell.</u>	

Visual Description of Final Composite Sample: <u>very dark brown with predominant clay characteristics and some small woody particles and sand grains, slight anoxic organic odor.</u>		
COC Time (time composite jar is capped): <u>1555 PST</u>	Total Dewatered/Filtered Sed. Weight in grams (g): <u>163.4g</u>	Sample Jars Collected (number, size, full or partial): <u>(1) 8 oz. partially (2) filled sample jar.</u>
Sample ID: <u>FO095696</u>	Duplicate sample collected? <u>Y(N)</u> DUPLICATE ID	
Duplicate Sample ID on COC: <u>NA</u>	Any deviations from standard operating procedures? <u>Y(N)</u>	
Describe:		

	CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave Portland, OR 97203-5452		
	INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET		
Project Name: <u>Portland Harbor Stormwater Sample</u>		Project Number: <u>1020.005</u>	
Sample Processing Conducted By: <u>PTB</u>	Sample Pt. Code: <u>18-ST5</u>	Removal Date: <u>6/4/09</u>	Processing Date: <u>6/10/09</u>
Basin: <u>1840 Winter 2007 Pilot Study</u>		Hansen ID: <u>AAX261</u>	Subbasin: <u>NA</u>
Sediment Trap Location Description/Address: <u>3250 NW St. Helens Road</u> <u>See PAGE 1 of 2</u>			

SEDIMENT TRAP PROCESSING/FILTRATION NOTES			
Filter Equipment/Method:		Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum – September 18, 2007].	
Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper): <u>Fisher Scientific, qualitative P5, 5-10.4 µm cellulose filter paper</u>			
Sediment Trap Bottle ID: <u>18-ST5-B3-SQ</u>		Sediment Trap Bottle ID: <u>18-ST5-B4-RECT</u>	
Total Est. Depth of Accumulated Sed in Bottle (inches): <u>0.2</u>		Total Est. Depth of Accumulated Sed in Bottle (inches): <u>0.9</u>	
Sample Processing Start Time: <u>1115 PST</u>	Sample Processing End Time: <u>1229 PST</u>	Sample Processing Start Time: <u>1242 PST</u>	Sample Processing End Time: <u>1555</u>
Number of Filters Used: <u>5</u> <u>p5</u> <u>(M)</u>		Number of Filters Used: <u>12</u> <u>p5</u> <u>(M)</u>	
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>50 mL</u>		Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): <u>65 mL</u>	
Tare Weight (empty jar in grams (g)): <u>226.0g</u> <u>jar + filtered sed from Bottle 1 + Bottle 2</u>		Tare Weight (jar and filtered sed. from Bottle 1 in grams (g)): <u>250.6g</u> <u>jar + Bottles 1, 2, 3 + Bottles 2, 3</u>	
Dewatered/Filtered Sed. Weight (g): <u>23</u> <u>24.6g</u> <u>PTB</u>		Dewatered/Filtered Sed. Weight (g): <u>113.6g</u> <u>Jar weight incl. lid and sed. weight from all 4 bottles: 364.2g</u>	
Sample Processing Notes/Comments: <u>First 2 filters had no recoverable solids. Material on last 3 filters were similar in composition consisting of fine silts and sands with little organic matter content. On filter 3 a pine needle settled onto the filter and was included in the composite.</u>		Sample Processing Notes/Comments: <u>First 4 filters had no recoverable solids. Supernate had difficult time filtering through. Final 8 filters had recoverable solids. This sample must have had more large particles or suspended fines due to increased processing time. Compared to bottles 2 & 3 the processing time tripled. Sediment recovered was silty clay with some small woody debris very dark brown in color.</u>	
Visual Description of Final Composite Sample: <u>Very dark brown with predominant clay characteristics and some small woody particles and sand grains. Slight anoxic organic odor.</u>			
GOC Time (time composite jar is capped): <u>1555 PST</u>	Total Dewatered/Filtered Sed. Weight in grams (g): <u>163.4g</u>	Sample Jars Collected (number, size, full or partial): <u>(1) 8 oz. partially (1/2) filled sample jar</u>	
Sample ID: <u>FO095696</u> affix FO number	Duplicate sample collected? <u>Y</u> <u>(N)</u> <u>DUPLICATE ID</u>		
Duplicate Sample ID on GOC: <u>NA</u> affix FO number sticker	Any deviations from standard operating procedures? <u>Y</u> <u>(N)</u> Describe:		



Page 1 of 6

Project Portland Harbor Stormwater Sump
Location WPCL Field Lab/Basin 18
Subject Basin 18 sediment Trap Processing

Project No. 1020.005
Date 6/10/09
By PTB

0855 PST Assembled fully deconned (as per SOP 7.01a) filtration apparatus. (Note: Decon included acetone and methanol rinses, a deviation from SOP 7.01a, as approved by customer Linda Scheffler for high priority analytes PCBs and ~~PAHs~~ and given precedent ^{as through} previous field documentation.) Filtration apparatus ^{was #123104} is 90mm diameter and a new P5 (5-10µm) filter was placed on setup and fully wetted using UPDI water and pulled via suction using a peristaltic pump to eliminate creases.

0910 Photographed bottle 1 of site 18-ST5, designation 18-ST5-B1-WM (0312.jpg) Weighed empty, clean 8 oz. sample jar [200.9g] to be used as composite of the four bottles from 18-ST5.

0924 Began filtration of 18-ST5-B1-WM. All supernate and solids ran through filter; used 50ml of UPDI water to remove trace solids adhered to bottle walls. 1st filter is final filter used.

0935 Photo of 1st + Final filter (0313.jpg). Added material accumulated on filter to empty, clean 8 oz. sample jar that was tared. Weight of sample jar w/ material from 18-ST5-B1-WM w/ lid [202.2g]
1.4g Seds from B1 ✓

0950 Pre-process photo of bottle 2 of site 18-ST5, designation 18-ST5-B2-NM. (0315.jpg). Replaced filter with new P5 (5-10µm) filter, 1st filter for this bottle. Wetted filter w/ suction using UPDI water.

0958 Began filtration of 18-ST5-B2-NM. Supernate has strong decomposing organic smell. 1st filter clogged with trace solids unrecoverable.

Attachments



Page 2 of 6

Project Portland Harbor Stormwater Sump
Location WPCL Field Lab/ Basin 18
Subject Basin 18 Sediment Trap Processing

Project No. 1020.005
Date 6/10/09
By PTB

- 1008 Placed 2nd filter on apparatus and continued filtration. P5 (5-10µm) Reached the majority of solids in bottle with this filter, mostly fine silts and sands, less noticeable organic smell. 2nd filter photo 0318.jpg. 2nd filter added to composite jar. ~~Weight of composite jar + lid + Bottle 1 + 2nd filter =~~ PTB
- 1022 Placed 3rd P5 (5-10µm) filter on apparatus and continued filtration after pouring out filtrate to prevent overflow.
- 1034 3rd filter clogged. All supernate has been processed. Next filter will be with 50ml of UPDI water to resuspend adhered material.
- 1038 Placed 4th P5 (5-10µm) filter on apparatus and continued filtration using the 50ml of UPDI water mentioned above. Trace solids on walls of filter cup removed with negligible amount of UPDI water from squirt bottle (teflon).
- 1047 All water filtered through. Solids from 4th + Final filter added to composite jar. All solids that were recoverable were similar in grain size composition, mostly fine sands and silts.
Weight of composite jar w/ cap + Bottle 1 + Bottle 2 = 226g ✓
23.8g from Bottle 2
- 1110 Pre-process photo of bottle 3 of site 18-ST5, designation 18-ST5-B3-SQ (0321.jpg) Replaced filter w/ new P5 (5-10µm) filter, 1st filter for this bottle. Wetted filter w/ suction using UPDI water.
- 1115 Began filtration of 18-ST5-B3-SQ. Surface of sediment has orange colored floc floating in the supernate. Filter #1 clogged w/ no recoverable solids.

Attachments



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Project Portland Harbor Stormwater Sump
Location WPCL Field Lab/Basin 18
Subject Basin 18 Sediment Trap Processing

Project No. 1020.005
Date 6/10/09
By PTB

1125 Placed 2nd P5 (5-10µm) filter on filtration set-up and continued filtration. Filter 2 clogged w/ no recoverable solids.

1134 Placed 3rd P5 (5-10µm) filter on filtration set-up and continued filtration. 3rd filter clogged fine silts and sands with minimal organics accumulated. Material added to composite jar. Pine needle found on surface of filter added to composite jar.

1145 Placed 4th P5 (5-10µm) filter on filtration set-up and continued filtration. 4th filter clogged with last of supernatant. Material is similar to that of 3rd filter. Photo #0324.jpg.

1200 Added material to composite jar.

1206 Placed 5th P5 (5-10µm) filter on filtration set-up and continued filtration w/ 50 ml of VPD water to resuspend the adhered solids on the inside walls of the bottle. Used squirt bottle to remove solids from walls of filter cup (reflex) ~~7/28/09~~

1229 Added material to composite jar. Material similar to filters #3 & 4. Weight of composite jar w/ lid + Bottles 1, 2 + 3 = 250.6g ✓

24.6g Bottle #3

1235 Pre-process photo of Bottle 4 of site 18-ST5, designation 18-ST5-B4-RECT (0327.jpg). Replaced filter with new P5 (5-10µm) filter, 1st filter for this bottle. Wetted filter using VPD water and suction.

Attachments



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Project Portland Harbor Stormwater Sump
Location WPCF Field Lab/Basin 18
Subject Basin 18 Sediment Trap Processing

Project No. 1020-005
Date 6/10/09
By PTB

1242 ✓ Began filtration of 18-ST5-B4-RECT. 1st filter clogged from supernatant. No recoverable solids present on filter, only some smaller than pea-sized pebbles. ✓

1253 ✓ Placed 2nd P5 (5-10µm) filter on filtration set-up and continued filtration of supernate. Filters 1+2 seem to clog faster than any of the other bottles from this site. Unusually slow for just the supernate. 2nd filter clogged ✓ from supernate. No recoverable solids present on filter.

1310 Placed 3rd P5 (5-10µm) filter on filtration set-up and continued filtration of supernate. Filter 3 also clogged relatively quickly. This bottle seems to have a lot of suspended solids. Bottle was handled in a similar manner to the other bottles ^{from this site} so resuspension of solids ^{is likely} not ^{the} cause. Perhaps the solids in this bottle did not settle as quickly as the others. ✓

Good Observation (A) ✓ Might be worth comparing with rectangular bottles from other sites. Maybe the solids captured by this bottle type ^{do} have properties that keep them in suspension longer. No recoverable solids present on clogged 3rd filter. ✓

1340 Placed 4th P5 (5-10µm) filter on filtration set-up and continued filtration. Beginning to get down to the sediment slurry but still within the ^{slurry} ~~supernate~~ supernate. Will switch this filter out before the slurry is passed through the filter. This filter saw the same immediate clogging as the 1st 3 filters for this bottle. Trace solids on filter.

Attachments recovered very minimal amount. ✓



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Project Portland Harbor Stormwater Sample
Location WPCL Field Lab/Basin 18
Subject Basin 18 Sediment Trap Processing

Project No. 1020-005
Date 6/10/09
By PTB/AJA

1348 Placed 5th P5 (5-10 μ m) filter on filtration set-up and continued filtration. Processing just the sediment slurry now with remaining supernate.

1402 PTB had to leave filtering operation. AJA continuing on. 5th P5 filter dry. 1st filter of B4 to have any significant sediments. Small woody debris is in a sediment/silt/clay mixture. Photographed (335.jpg), composited into 8 oz jar. Replaced P5 filter (Sixth filter) continued sampling B4 slurry.

1427 Filter Six dry. Removed sediment from filter and composited into 8 oz jar. Replaced filter with Seventh P5 (5-10 μ m) filter and continued.

1505 Filter Seven dry. Removed sediment placed into composite jar. Replaced with Eighth P5 (5-10 μ m) filter and continued filtering.

1517 Filter 8 dry. Very silty, slightly wet sediment cake collected into composite jar. Replaced filter with Ninth P5 (5-10 μ m) filter to continue process. Poured last slurry into filter cup. No UPDT has been used to rinse up to this point.

1525 9th filter dry. Collected sed into comp. jar. Renewed filter with 10th P5 (5-10 μ m) filter. Continued processing. (TAP)
7/28/09

Attachments



Page 6 of 6

Project Portland Harbor Stormwater Samp
Location WPCL Field Lab/Basin 18
Subject Basin 18 Sediment Trap Processing

Project No. 1020.005
Date 6/10/09
By AJA

1535 ~~10th~~ 10th filter dry. Very dark brown silty sediment collected into Comp Jar. Renewed filter with 11th p5 (5-10 μ m) filter. Used 50 ml UPDI to re suspend residual seds inside ST5-B4.

1540 11th filter dry. Some small woody particles present on filter. Used an additional 15 ml upDI to rinse inside of bottle. Renewed filter w/ 12th p5 (5-10 μ m) filter.

1550 12th and final filter dry. Some angular particles present along with fine silt. Composite, homogenized, and photographed (336, 337 jpg.) 113.6g Bottles

1555 Capped Composite.
Overall comp. is very dark brown clay like, with some small woody particles and some sand grains. Slight anoxic organic odor present. 7/24/09

Final Comp wt = 364.2 g ✓
tare wt = 200.8 g ✓
total seds = 163.4 g ✓

2009 Inline Solids



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

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



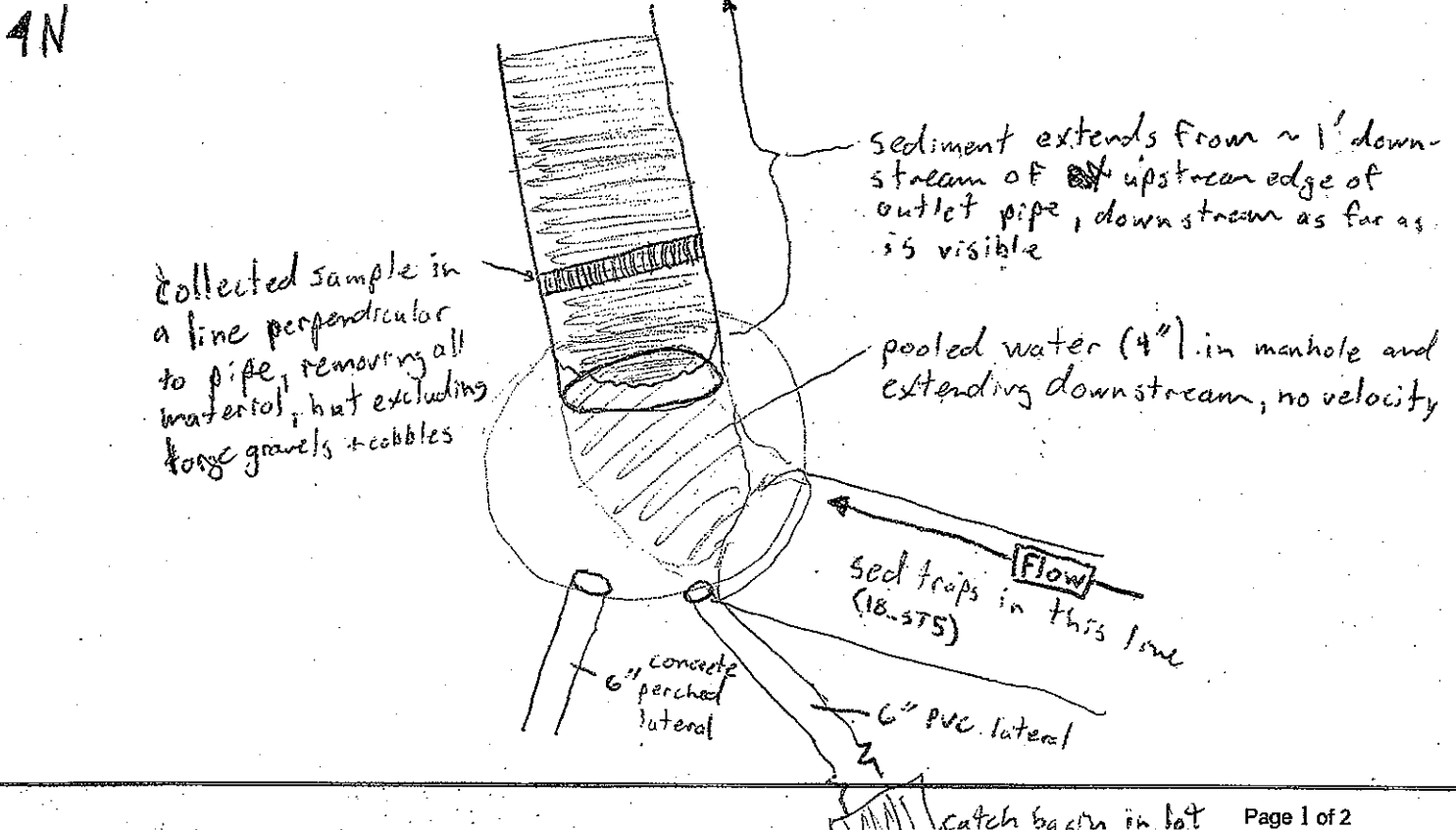
INLINE SEDIMENT SAMPLING FIELD DATA SHEET

Project Name: <u>Portland Harbor Inline Samp.</u>		Project Number: <u>1020.001</u>	
Sampling Team: <u>MJS/AJA</u>	Date: <u>6/4/09</u>	Arrival Time: <u>1015</u>	Current Weather Conditions/Last Rain: <u>Overcast, Warm, Muggy, Sprinkling</u>
Basin: <u>18</u>	Node: <u>AAX-261</u>	Subbasin:	
Sampling Location Description/Address: <u>Wilhelm Trucking near yard @ 3250 NW St Helens Rd</u>			

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe any flowing or standing water observed in the line?	<u>Approx. 4" depth water. Standing, no velocity</u>
Does river appear to back up to this location? Describe rate/color/odor of flow:	<u>No. no apparent odor (undisturbed)</u>
Are sediments observed in the line?	<u>Yes.</u>
Are sample-able quantities of sediments present in the line?	<u>Yes. Seds are 3-4 inches deep. Lots of cobble with spaces bwn Cobble of only fine silt/mud.</u>
Describe lateral extent of sample-able sediments present in the line:	<u>(Begins about 1 ft up of node) Sediments extend up pipe at least 30 ft.</u>

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



Date: 6/4/09		SECTION 2 - SAMPLE COLLECTION REPORT		Node: AAX261	
Sampling Equipment:		<input checked="" type="checkbox"/> Stainless steel spoon & stainless steel bucket <input type="checkbox"/> Other (Describe)			
Equipment Decontamination process:		<input checked="" type="checkbox"/> Per SOP7.01a <input type="checkbox"/> Other (Describe)			
Sample date: 6/4/09	Sample time: 1145 pdt	Sample Identification: (IL-XX-NNNNNN-mmyy) 15-18 15-10-AAX261-0609			
Sample location description: (number of feet from node of entry) 4 ft d/s from node, fewer cobbles at this location					
Sample collection technique:		On a cross section collected approx 4 ft from node. Avoiding gravels and cobbles			
Describe Color of sample:		Mostly light brown, striations of black material			
Describe Texture/Particle size:		Sand, silt, and clay ~20% cobbles + coarse gravel excluded during S			
Describe visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.):		Hydrocarbon odor present after sediment disturbance, sheen also present			
Describe depth of solids in area where sample collected:		3-4" deep at collection X-section			
Describe amount and type of debris in sample:		None present			
Amount and type of debris removed from final sample:		None			
Compositing notes: Filled 8 Jars total from SS bucket, Thoroughly Homogenized					
Sample Jars Collected (number, size, full or partial)? 1-8 oz, 7-4 oz Jars					
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).					
Lab ID		Duplicate sample collected? Y/N Dupe ID			
Duplicate sample identification # on COC:					
Any deviations from standard procedures:					

SECTION 3 - PHOTOGRAPH LOG	
Overview of node showing drainage area	✓
Plan view of sediments inline	✓
Homogenized sample (sediment in bowl)	✓
Other?	x Photo prior to compositing



Page 1 of 3

Project Inline Sediment Sampling Project No. 1020.001
Location Wilhelm Trucking Basin 18 Date 6/4/09
Subject Inline Sed sample field decon of Bucket + Spoon By AJA MJS

Inline Sed ~~traps~~ ^{MS} Sampling
Field Decon Notes

1125 Preparing to blank test our composting bucket and spoon that is used ~~for~~ ^{MS} for inline sediment sampling.

Ringed bucket + spoon (Stainless steel)
3 times with UPDI from a 20 liter Nalgene carboy. (Clear, rectangular)

1128 Fill bucket part way with updi running over the spoon while filling. Poured UPDI directly into sample bottles (1 pre-cleaned Nalgene 500ml, 3-1L glass amber bottles) capped, and placed in cooler w/ blue ice.

1505 Relinquished to WPCU

FO095673



Page 11 X 2 of 3

Project Inline Sed Samp.
Location Basin 18
Subject Inline Sed Samp basin 18

Project No. 1020.001
Date 6/4/09
By AJA MJS

- 1140 Completed Field blank on SS bucket + Spoon (see green sheet for that effort)
- 1145 Assessed inline sediment, chose area ~4' d/s of node due to presence of fine grained sedg and lack of large cobble and gravel. Sed zone starts ~1 ft d/s of node and goes as far as can see (~30 ft) Cobbles and gravels fairly evenly interspersed with fine grained sedg through out entire sediment area. Depth of 3-4" of sediment present throughout deposit. Cobbles and gravels concentrated in pockets (like islands) evenly interspersed through out area.
- 1155 Sample collected and homogenized in the node vault. Excluded gravels + Cobbles during each subsample. Very little material removed from final composite (some gravel/cobble)
- 1200 Brought homogenized composite to surface. Appearance is golden brown, composition is a ~~gr~~ ^{fine} sandy slurry of silt and clay. Viscous, but fluid. Strong hydrocarbon odor. Filled 7-4 oz jars and 1-8 oz jar capped, and stored in cooler. Sample 18-10

Attachments

Attachment D
Laboratory Results

2007 Sediment Trap and Inline Solids



55 SW Yamhill Street, Suite 400 Portland, OR 97204
P: 503.239.8799 F: 503.239.8940
info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review Inline Solids Investigation City Outfall Basin 18

To: File
From: Karen Demsey, GSI Water Solutions, Inc.
Date: June 6, 2008

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated for chemical analysis of inline solids obtained during source control investigation activities conducted in June 2007 by the City of Portland in Outfall Basin 18 (OF-18). The results of the sampling and analysis are presented in the Technical Memorandum No. OF18-2.

The laboratory analysis of the OF 18 solids samples was conducted by Columbia Analytical Services, Inc., of Kelso, Washington. The samples were analyzed for one or more of the following:

- Total Solids (EPA 160.3M)
- Total Organic Carbon (TOC) (ASTM D1429-82M)
- Metals (EPA 6000 and 7000 Series)
- Organochlorine Pesticides (EPA 8081A)
- Chlorinated herbicides (EPA 8151A)
- Polychlorinated Biphenyls (PCBs) (EPA 8082)
- Polynuclear Aromatic Hydrocarbons (PAHs) (EPA 8270C-SIM)
- Semi-volatile Organic Compounds (including PAHs and Phthalates) (SVOCs) (EPA 8270C).

The laboratory data report for the analysis of these samples is included along with this QA/QC review in Attachment C to Technical Memorandum No. OF18-2.

This QA/QC review of the analytical data, based upon the available documentation supplied by the laboratory, consisted of reviewing the following:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within accuracy control limits
- Matrix spike and matrix spike duplicate results within control limits
- Laboratory control sample and duplicate laboratory control sample recoveries within control limits

The results of the laboratory report QA/QC review are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the acceptable holding times for all analyses.

Method Blanks

Method blanks were processed during the subcontracted analysis of all parameters listed above. Aluminum was detected at a concentration of 10.6 mg/Kg in the method blank for analysis of metals by EPA Method 6020. This concentration is significantly lower than the concentrations detected in the field samples, and interpretation of the data is not affected. No other metals were detected in this method blank. No detections occurred in the method blanks for the other analyses.

Matrix Spike/Matrix Spike Duplicates

CAS reports there was insufficient volume to perform a matrix spike/matrix spike duplicate (MS/MSD) analysis for chlorinated herbicides and PAHs. A laboratory control sample/duplicate laboratory control sample was analyzed and reported in lieu of the MS/MSD for these samples.

Laboratory Control /Laboratory Control Duplicate Samples

Laboratory control/laboratory control duplicate samples were processed during the laboratory analyses of SVOCs. CAS reports that the relative percent difference for benzoic acid in the Laboratory Control Sample (LCS) analyses was outside control criteria. However, all spike recoveries in the MS, MSD, and associated replicate laboratory control sample were within acceptance limits, indicating the analytical batch was in control. CAS reports that no further corrective action was appropriate and the data quality was not significantly affected. The results of the LCS/LCDS analyses are not included in the attached laboratory report.

Other

The following notes were included in the laboratory narrative relative to the Outfall 18 samples; these observations do not affect interpretation of the data as reported in Technical Memorandum No. OF18-2:

Method reporting limits (MRL). The MRLs were elevated for one or more samples in several of the analyses due to matrix interference, and these data were qualified (“i” flag) by CAS:

- Organochlorine pesticides (EPA 8081A): Samples FO 070806 and FO 070809 required dilution due to the presence of elevated levels of target analytes and non-target background components. The MRLs for all analytes were adjusted by CAS to reflect the dilution. The elevated MRLs could result in a low bias being reported for total DDT in these two samples.
- PCB Aroclors (EPA 8082): MRLs are elevated for at least one analyte in most of the samples due to the presence of non-target background components. The elevated MRLs could result in a low bias being reported for total PCBs.
- Chlorinated herbicides (EPA 8151A): The reporting limit was elevated for all analytes in sample FO 070807 due to relatively high levels of non-target background components.
- SVOCs (EPA Method 8270C): The MRLs for most samples were elevated due to less than optimal sample mass extracted for analysis and the presence of elevated levels of target analytes and non-target compounds.
- PAHs (EPA Method 8270C): The MRLs for sample FO 070807 were elevated due to less than optimal sample mass extracted for analysis.

Semivolatile organic compounds (EPA Method 8270C). An initial calibration (ICAL) exception was noted for di-n-octyl phthalate and alternative EPA method-specific evaluations were performed using the mean Relative Standard Deviation (RSD). The RSD value was 7.9% and reported to be within the alternative evaluation criteria.

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



City of Portland
Chain-of-Custody
Bureau of Environmental Services



Date: 6/21/07
Page: 1 of 1
Collected By: JXB/DSH/
AJA/ECH

Project Name: **PORTLAND HARBOR STORMWATER SAMP**
File Number: 1020.005 Matrix: SEDIMENT

Requested Analyses

						General							Metals		Comments	
All Analyses to be performed at CAS If insufficient sample volume, analyses should be performed by priority list below: PCB Congeners, PCB Aroclors, TOC, TS, Pesticides, PAH + Phthalates, Metals, Herbicides Sediment traps installed: 3/13 - 3/15/07; removed: 6/18 - 6/19/07						PCB Congeners (All 209)	PCB Aroclors	TOC	TS	Organo-chlorine Pesticides	PAH + Phthalates (Low-level)	Herbicides	Total Metals (Al, Sb, As, Cd Cr Cu, Pb, Mn, Ni, Ag, Zn) + Hg			
WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type											
FO 070804	ST-M1-AAJ944-0607 6936 N FATHOM ST	M1_ST1	6/18/07	1503	C	●	●	●	●	●	●	●	●		111g (sufficient volume to run all analyses)	
						*	●	●	●	×	×	×	×			
FO 070805	ST-18-AAT565-0607 NW 35TH & YEON	18_ST1	6/19/07	1148	C	●	●	●	●	×	×	×	×		10.8 g (x if possible)	
FO 070806	ST-18-AAT557-0607 3950 NW YEON AVE	18_ST2	6/19/07	1602	C	●	●	●	●	●	●	×	×		44.5 g (x if possible)	
FO 070807	IL-18-AAT557-0607 3950 NW YEON AVE	18_10	6/19/07	1435	G	●	●	●	●	●	●	●	●		Inline sample collected at Sediment Trap Installation	
FO 070808	ST-18-AND535-0607 4033 NW YEON AVE	18_ST3	6/20/07	915	C	●	●	●	●	×	×	×	×		15.8 g (x if possible)	
FO 070809	ST-18-AAT466-0607 4033 NW YEON AVE	18_ST4	6/20/07	1258	C	●	●	●	●	●	●	●	●		73.1 g (x if possible)	
									</							

Basic
18
Samples

Relinquished By: 1. Signature: <u>[Signature]</u> Time: <u>1058</u> Printed Name: <u>Peter Abrams</u> Date: <u>6/21/07</u>	Relinquished By: 2. Signature: _____ Time: _____ Printed Name: _____ Date: _____	Relinquished By: 3. Signature: _____ Time: _____ Printed Name: _____ Date: _____	Relinquished By: 4. Signature: _____ Time: _____ Printed Name: _____ Date: _____
Received By: 1. Signature: <u>[Signature]</u> Time: <u>1058</u> Printed Name: <u>KES DENNIS</u> Date: <u>6/21/07</u>	Received By: 2. Signature: _____ Time: _____ Printed Name: _____ Date: _____	Received By: 3. Signature: _____ Time: _____ Printed Name: _____ Date: _____	Received By: 4. Signature: _____ Time: _____ Printed Name: _____ Date: _____



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO070805

Sample Collected: 06/19/07 11:48
Sample Received: 06/21/07

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT565-0607
NW 35TH & YEON / US OF CB INLET AT MH
Sample Point Code: 18_ST1
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AL05846
EID File # : 1020.005
LocCode: PORTHASW
Collected By: JXB/DJH

Comments:

All analyses were performed by Columbia Analytical Services, Inc. (CAS). Refer CAS report for results.

Test Parameter	Result	Units	MRL	Method	Analysis Date
OUTSIDE ANALYSIS					
OUTSIDE LABORATORY ANALYSIS					
Refer to Contract Report	Completed				06/22/07

End of Report for Sample ID: FO070805

Report Date: 09/27/07

Validated By: 



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO070806

Sample Collected: 06/19/07 16:02
Sample Received: 06/21/07

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT557-0607
3950 NW YEON AVE / US OF MANHOLE
Sample Point Code: 18_ST2
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AL05847
EID File # : 1020.005
LocCode: PORTHASW
Collected By: JXB/DJH

Comments:

All analyses were performed by Columbia Analytical Services, Inc. (CAS). Refer CAS report for results.

Test Parameter	Result	Units	MRL	Method	Analysis Date
OUTSIDE ANALYSIS					
OUTSIDE LABORATORY ANALYSIS					
Refer to Contract Report	Completed				06/22/07

End of Report for Sample ID: FO070806

Report Date: 09/27/07

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO070807

Sample Collected: 06/19/07 14:35
Sample Received: 06/21/07

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP

Report Page: Page 1 of 1

Address/Location: IL-18-AAT557-0607
3950 NW YEON AVE

Sample Point Code: 18_10

System ID: AL05848

Sample Type: COMPOSITE

EID File # : 1020.005

Sample Matrix: SEDIMENT

LocCode: PORTHASW

Collected By: JXB/DJH

Comments:

All analyses were performed by Columbia Analytical Services, Inc. (CAS). Refer CAS report for results.

Test Parameter	Result	Units	MRL	Method	Analysis Date
OUTSIDE ANALYSIS					
OUTSIDE LABORATORY ANALYSIS					
Refer to Contract Report	Completed				06/22/07

End of Report for Sample ID: FO070807

Report Date: 09/27/07

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO070808

Sample Collected: 06/20/07 09:15
Sample Received: 06/21/07

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AND535-0607
4033 NW YEON AVE / 42 INCH LINE US OF MH
Sample Point Code: 18_ST3
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AL05849
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/DJH

Comments:

All analyses were performed by Columbia Analytical Services, Inc. (CAS). Refer CAS report for results.

Test Parameter	Result	Units	MRL	Method	Analysis Date
OUTSIDE ANALYSIS					
OUTSIDE LABORATORY ANALYSIS					
Refer to Contract Report	Completed				06/22/07

End of Report for Sample ID: FO070808

Report Date: 09/27/07

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO070809

Sample Collected: 06/20/07 12:58
Sample Received: 06/21/07

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT466-0607
4033 NW YEON AVE / 48 INCH LINE US OF MH
Sample Point Code: 18_ST4
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AL05850
EID File # : 1020.005
LocCode: PORTHASW
Collected By: JXB/DJH

Comments:

All analyses were performed by Columbia Analytical Services, Inc. (CAS). Refer CAS report for results.

Test Parameter	Result	Units	MRL	Method	Analysis Date
OUTSIDE ANALYSIS					
OUTSIDE LABORATORY ANALYSIS					
Refer to Contract Report	Completed				06/22/07

End of Report for Sample ID: FO070809

Report Date: 09/27/07

Validated By:

August 7, 2007

Analytical Report for Service Request No: K0705409

Jennifer Shackelford
Portland, City of
1120 SW Fifth Avenue # 600
Portland, OR 97204

RE: Portland Harbor Inline Samp

Dear Jennifer:

Enclosed are the results of the sample(s) submitted to our laboratory on June 22, 2007. For your reference, these analyses have been assigned our service request number K0705409.

All analyses were performed according to our laboratory's quality assurance program. Where applicable, the methods cited conform to the Methods Update Rule (effective 4/11/2007), which relates to the use of analytical methods for the drinking water and waste water programs. The test results meet requirements of the NELAC standards. Exceptions are noted in the case narrative report where applicable. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at LVo@kelso.caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Loan Vo, Ph.D.
Project Chemist

LV/lb

Page 1 of 59

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client: City of Portland
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request No.: K0705409
Date Received: 06/22/2007

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier I data deliverables. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Eight sediment samples were received for analysis at Columbia Analytical Services on 06/22/2007. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA Method 8081A

Continuing Calibration Verification (CCV) Exceptions:

The primary evaluation criterion was exceeded for Decachlorobiphenyl in CCV 0716F018; for Toxaphene in CCVs 0719F005, 0719F022, 0726F020; and for Endrin Ketone, Toxaphene in CCV0726F038. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

Results for Decachlorobiphenyl in samples KWG0707330-4MB, KWG0707161-5LCS/6DLCS, and FO 070804 have been reported from a column using average percent recovery of all analytes in the verification standard.

Sample Confirmation Notes:

The confirmation comparison criterion of 40% difference for at least one analyte in a few samples. The higher of the two values was reported when both peaks were within the expected retention time window for this analysis and Gaussian in shape. The lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Elevated Method Reporting Limits:

Samples 0070806 and FO 070809 required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.

Approved by _____ W Date 9/6/07

The reporting limit is elevated, or further elevated, for several analytes in a few samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the reporting limit. The results are flagged to indicate the matrix interference.

PCB Aroclors by EPA Method 8082

The primary evaluation criterion was exceeded for Aroclor 1016 in CCV 0723F016 and for Aroclor 1260 in CCV 0724F004. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

The confirmation comparison criterion of 40% difference for Aroclor 1248 was exceeded in sample FO 070806. The higher of the two values was reported when both peaks were within the expected retention time window for this analysis and Gaussian in shape.

The reporting limits are elevated for at least one analyte in most of the samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the reporting limits. The results are flagged to indicate the matrix interference.

Aroclor 1248, Aroclor 1260, and Aroclor 1268 were identified in several samples. When mixtures of PCB Aroclors are present in a sample, correct identification and quantitative analysis of the individual Aroclors can be subjective. In particular, when mixtures are present, differentiating Aroclor 1242 from Aroclor 1248 can be difficult.

When Aroclor mixtures are present in a sample, care is taken to minimize the possibility of double-counting PCBs. Analytical peaks are selected based on the best resolution possible for that particular sample. However, when a mixture of Aroclors 1248, 1260, and 1268 are present in a sample, the potential exists for a high bias from contribution of one Aroclor to another due to common peaks or peaks that cannot be completely resolved.

Chlorophenoxy Herbicides by EPA Method 8151

The primary evaluation criterion was exceeded for a few analytes in CCV 0730F026, 0730F043. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard meets the alternative evaluation criteria.

6

The analysis of Chlorinated Herbicides by EPA 8151 requires the use of dual column confirmation. When the CCV criteria is met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for MCPA in sample KWG0707265-3MB. The results are reported from the column with an acceptable CCV. The data quality is not affected. No further corrective action was necessary.

Matrix Spike Recovery Exceptions:

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Elevated Method Reporting Limits:

The reporting limit is elevated for all analytes in samples FO 070807. The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. A semiquantitative screen was performed prior to final analysis. The results of the screening indicated the need to perform a dilution. The result is flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Semivolatile Organic Compounds by EPA Method 8270C

Initial Calibration (ICAL) Exceptions:

The primary evaluation criterion was exceeded for Di-n-octyl Phthalate in ICAL ID CAL6370. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the mean Relative Standard Deviation (RSD) of all analytes in the calibration. The result of the mean RSD calculation was 7.9%. The calibration meets the alternative evaluation criteria. Note that CAS/Kelso policy does not allow the use of averaging if any analyte in the ICAL exceeds 30% RSD.

Relative Percent Difference Exceptions:

The Relative Percent Difference (RPD) for Benzoic Acid in the replicate Laboratory Control Sample (LCS) analyses (KWG0707313-3 and KWG0707313-4) was outside control criteria. All spike recoveries in the MS, DMS, and associated replicate Laboratory Control Sample (LCS/DLCS) analyses were within acceptance limits, indicating the analytical batch was in control. The analyte in question was not detected in the associated field sample. The data quality is not significantly affected. No further corrective action was appropriate.

Elevated Method Reporting Limits:

The Method Reporting Limits (MRL) for most samples were elevated due to less than optimal sample mass extracted for analysis. The sample contained low percent solids which prevented extraction of the sample mass necessary to achieve target MRLs. Additionally, all samples required dilutions due to the presence of elevated levels of target analytes and non-target compounds. The reporting limits are adjusted to reflect the dilutions.

No other anomalies associated with the analysis of these samples were observed.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C

Elevated Method Reporting Limits:

The Method Reporting Limits (MRL) for sample FO 070807 were elevated due to less than optimal sample mass extracted for analysis. The sample contained low percent solids which prevented extraction of the sample mass necessary to achieve target MRLs.

Sample Notes and Discussion


Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

No other anomalies associated with the analysis of these samples were observed.

Approved by W Date 9/6/07

PCB Congeners by EPA Method 1668A

PCB Congeners analysis by EPA Method 1668A was performed at Columbia Analytical Services laboratory in Houston, TX. The narrative for this analysis can be found in the corresponding section of this data package.

Approved by _____  Date 9/6/07

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inli
Sample Matrix: Sediment

Service Request: K0705409

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
FO 070803	K0705409-001	06/21/2007	06/22/2007	06/25/2007	42.8	
FO 070804	K0705409-002	06/18/2007	06/22/2007	06/25/2007	37.9	
FO 070805	K0705409-003	06/19/2007	06/22/2007	06/25/2007	54.7	
FO 070806	K0705409-004	06/19/2007	06/22/2007	06/25/2007	54.0	
FO 070807	K0705409-005	06/19/2007	06/22/2007	06/25/2007	7.18	
FO 070808	K0705409-006	06/20/2007	06/22/2007	06/25/2007	59.1	
FO 070809	K0705409-007	06/20/2007	06/22/2007	06/25/2007	66.3	
FO 070810	K0705409-008	06/19/2007	06/22/2007	06/25/2007	51.3	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Portland, City of
Project Name : Portland Harbor Inline Samp
Project Number : NA
Sample Matrix : SEDIMENT

Service Request : K0705409
Date Collected : 06/18-20/07
Date Received : 06/22/07

Carbon, Total Organic

Prep Method : SOP
Analysis Method : ASTM D4129-82M
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
FO 070804	K0705409-002	0.05	0.02	1	6/28/2007	07/19/07	11.1	
FO 070806	K0705409-004	0.05	0.02	1	6/28/2007	07/19/07	10.6	
FO 070807	K0705409-005	0.05	0.02	1	6/28/2007	07/19/07	9.11	
FO 070808	K0705409-006	0.05	0.02	1	6/28/2007	07/19/07	3.56	
FO 070809	K0705409-007	0.05	0.02	1	6/28/2007	07/19/07	5.61	
Method Blank	K0705409-MB	0.05	0.02	1	6/28/2007	07/19/07	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

- Cover Page -

INORGANIC ANALYSIS DATA PACKAGE

Client : Portland, City of
Project Name : Portland Harbor Inline Samp
Project No. : NA

Service Request : K0705409

Sample Name :

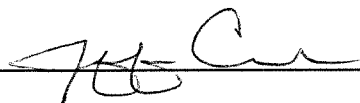
FO 070804
FO 070807
FO 070809
Method Blank

Lab Code :

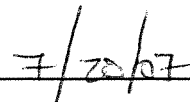
K0705409-002
K0705409-005
K0705409-007
K0705409-MB

Comments:

Approved By: _____



Date: _____



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Portland, City of
Project Name : Portland Harbor Inline Samp
Project No. : NA
Matrix : Sediment

Service Request : K0705409
Date Collected : 06/19/07
Date Received : 06/22/07
Date Extracted : 06/27-07/06/07

Total Metals

Sample Name : FO 070807
Lab Code : K0705409-005

Units : mg/Kg (ppm)
Basis : Dry

Analyte	Analysis Method	MRL	Date Analyzed	Sample Result	Result Notes
Aluminum	6010B	900	07/13/07	13800	
Antimony	6020	0.2	06/29/07	9.1	
Arsenic	6020	2	07/13/07	114	
Cadmium	6020	0.09	07/13/07	8.4	
Chromium	6020	0.9	07/13/07	33.9	
Copper	6020	0.5	07/13/07	79.8	
Lead	6020	0.2	07/13/07	128	
Manganese	6010B	90	07/13/07	111000	
Mercury	7471A	0.02	07/09/07	0.12	
Nickel	6020	0.9	07/13/07	36.0	
Silver	6020	0.09	06/29/07	0.35	
Zinc	6010B	200	07/13/07	2470	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Portland, City of
Project Name : Portland Harbor Inline Samp
Project No. : NA
Matrix : Sediment

Service Request : K0705409
Date Collected : 06/20/07
Date Received : 06/22/07
Date Extracted : 06/27-07/06/07

Total Metals

Sample Name : FO 070809
Lab Code : K0705409-007

Units : mg/Kg (ppm)
Basis : Dry

Analyte	Analysis Method	MRL	Date Analyzed	Sample Result	Result Notes
Aluminum	6010B	10	07/13/07	11300	
Antimony	6020	0.05	06/29/07	1.68	
Arsenic	6020	0.5	07/13/07	2.8	
Cadmium	6020	0.02	07/13/07	1.30	
Chromium	6020	0.2	07/13/07	62.4	
Copper	6020	0.1	07/13/07	82.1	
Lead	6020	0.05	07/13/07	220	
Manganese	6010B	1	07/13/07	509	
Mercury	7471A	0.02	07/09/07	0.36	
Nickel	6020	0.2	07/13/07	22.8	
Silver	6020	0.02	06/29/07	0.25	
Zinc	6010B	2	07/13/07	584	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Portland, City of
Project Name : Portland Harbor Inline Samp
Project No. : NA
Matrix : Sediment

Service Request : K0705409
Date Collected : NA
Date Received : NA
Date Extracted : 06/27-07/06/07

Total Metals

Sample Name : Method Blank
Lab Code : K0705409-MB

Units : mg/Kg (ppm)
Basis : Dry

Analyte	Analysis Method	MRL	Date Analyzed	Sample Result	Result Notes
Aluminum	6010B	10	07/13/07	10.6	
Antimony	6020	0.05	06/29/07	ND	
Arsenic	6020	0.5	07/13/07	ND	
Cadmium	6020	0.02	07/13/07	ND	
Chromium	6020	0.2	07/13/07	ND	
Copper	6020	0.1	07/13/07	ND	
Lead	6020	0.05	07/13/07	ND	
Manganese	6010B	1	07/13/07	ND	
Mercury	7471A	0.02	07/09/07	ND	
Nickel	6020	0.2	07/13/07	ND	
Silver	6020	0.02	06/29/07	ND	
Zinc	6010B	2	07/13/07	ND	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Organochlorine Pesticides

Sample Name: FO 070806
Lab Code: K0705409-004
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
beta-BHC	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
gamma-BHC (Lindane)	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
delta-BHC	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
Heptachlor	66	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Aldrin	16	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Heptachlor Epoxide	16	PD	9.3	10	07/02/07	07/19/07	KWG0707161	
gamma-Chlordane†	87	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Endosulfan I	22	PD	9.3	10	07/02/07	07/19/07	KWG0707161	
alpha-Chlordane	34	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Dieldrin	40	PD	9.3	10	07/02/07	07/19/07	KWG0707161	
4,4'-DDE	100	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Endrin	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
Endosulfan II	16	PD	9.3	10	07/02/07	07/19/07	KWG0707161	
4,4'-DDD	69	D	9.3	10	07/02/07	07/19/07	KWG0707161	
Endrin Aldehyde	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
Endosulfan Sulfate	ND	Ui	15	10	07/02/07	07/19/07	KWG0707161	
4,4'-DDT	ND	Ui	44	10	07/02/07	07/19/07	KWG0707161	
Endrin Ketone	ND	U	9.3	10	07/02/07	07/19/07	KWG0707161	
Methoxychlor	ND	Ui	15	10	07/02/07	07/19/07	KWG0707161	
Toxaphene	ND	Ui	1600	10	07/02/07	07/19/07	KWG0707161	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	48	32-138	07/19/07	Acceptable
Decachlorobiphenyl	150	23-162	07/19/07	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/19/2007
 Date Received: 06/22/2007

Organochlorine Pesticides

Sample Name: FO 070807
 Lab Code: K0705409-005
 Extraction Method: EPA 3540C
 Analysis Method: 8081A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	3.7	1	07/02/07	07/27/07	KWG0707161	
beta-BHC	ND	U	4.2	1	07/02/07	07/27/07	KWG0707161	
gamma-BHC (Lindane)	ND	Ui	4.8	1	07/02/07	07/27/07	KWG0707161	
delta-BHC	ND	Ui	90	1	07/02/07	07/27/07	KWG0707161	
Heptachlor	31		3.5	1	07/02/07	07/27/07	KWG0707161	
Aldrin	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
Heptachlor Epoxide	3.6	P	3.5	1	07/02/07	07/27/07	KWG0707161	
gamma-Chlordane†	52		3.5	1	07/02/07	07/27/07	KWG0707161	
Endosulfan I	8.8		3.5	1	07/02/07	07/27/07	KWG0707161	
alpha-Chlordane	11		3.5	1	07/02/07	07/27/07	KWG0707161	
Dieldrin	4.4	P	4.1	1	07/02/07	07/27/07	KWG0707161	
4,4'-DDE	26		3.5	1	07/02/07	07/27/07	KWG0707161	
Endrin	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
Endosulfan II	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
4,4'-DDD	19		3.5	1	07/02/07	07/27/07	KWG0707161	
Endrin Aldehyde	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
Endosulfan Sulfate	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
4,4'-DDT	17		3.5	1	07/02/07	07/27/07	KWG0707161	
Endrin Ketone	ND	Ui	7.1	1	07/02/07	07/27/07	KWG0707161	
Methoxychlor	ND	U	3.5	1	07/02/07	07/27/07	KWG0707161	
Toxaphene	ND	Ui	240	1	07/02/07	07/27/07	KWG0707161	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	60	32-138	07/27/07	Acceptable
Decachlorobiphenyl	68	23-162	07/27/07	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/20/2007
 Date Received: 06/22/2007

Organochlorine Pesticides

Sample Name: FO 070809
 Lab Code: K0705409-007
 Extraction Method: EPA 3540C
 Analysis Method: 8081A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
beta-BHC	ND	Ui	13	10	07/02/07	07/17/07	KWG0707161	
gamma-BHC (Lindane)	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
delta-BHC	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Heptachlor	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Aldrin	17	D	7.6	10	07/02/07	07/17/07	KWG0707161	
Heptachlor Epoxide	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
gamma-Chlordane†	31	D	7.6	10	07/02/07	07/17/07	KWG0707161	
Endosulfan I	14	PD	7.6	10	07/02/07	07/17/07	KWG0707161	
alpha-Chlordane	20	D	7.6	10	07/02/07	07/17/07	KWG0707161	
Dieldrin	18	PD	7.6	10	07/02/07	07/17/07	KWG0707161	
4,4'-DDE	57	D	7.6	10	07/02/07	07/17/07	KWG0707161	
Endrin	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Endosulfan II	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
4,4'-DDD	49	D	7.6	10	07/02/07	07/17/07	KWG0707161	
Endrin Aldehyde	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Endosulfan Sulfate	36	D	7.6	10	07/02/07	07/17/07	KWG0707161	
4,4'-DDT	ND	Ui	33	10	07/02/07	07/17/07	KWG0707161	
Endrin Ketone	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Methoxychlor	ND	U	7.6	10	07/02/07	07/17/07	KWG0707161	
Toxaphene	ND	Ui	510	10	07/02/07	07/17/07	KWG0707161	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	32-138	07/17/07	Acceptable
Decachlorobiphenyl	110	23-162	07/17/07	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: NA
 Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
 Lab Code: KWG0707161-4
 Extraction Method: EPA 3540C
 Analysis Method: 8081A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.26	1	07/02/07	07/16/07	KWG0707161	
beta-BHC	ND	U	0.78	1	07/02/07	07/16/07	KWG0707161	
gamma-BHC (Lindane)	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
delta-BHC	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Heptachlor	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Aldrin	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Heptachlor Epoxide	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
gamma-Chlordane†	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endosulfan I	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
alpha-Chlordane	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Dieldrin	ND	U	0.29	1	07/02/07	07/16/07	KWG0707161	
4,4'-DDE	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endrin	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endosulfan II	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
4,4'-DDD	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endrin Aldehyde	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endosulfan Sulfate	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
4,4'-DDT	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Endrin Ketone	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Methoxychlor	ND	U	0.25	1	07/02/07	07/16/07	KWG0707161	
Toxaphene	ND	U	13	1	07/02/07	07/16/07	KWG0707161	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	67	32-138	07/16/07	Acceptable
Decachlorobiphenyl	85	23-162	07/16/07	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

**See Revised Laboratory Report (attached) for PCB
Aroclors**

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/19/2007
 Date Received: 06/22/2007

Chlorinated Herbicides

Sample Name: FO 070807
 Lab Code: K0705409-005
 Extraction Method: METHOD
 Analysis Method: 8151A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	Ui	120000	100	06/29/07	08/03/07	KWG0707265	
Dicamba	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	
MCP	ND	U	700000	10	06/29/07	08/03/07	KWG0707265	
MCPA	ND	U	700000	10	06/29/07	08/03/07	KWG0707265	
Dichlorprop	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	
2,4-D	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	
2,4,5-TP (Silvex)	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	
2,4,5-T	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	
2,4-DB	7200	PD	3500	10	06/29/07	08/03/07	KWG0707265	
Dinoseb	ND	U	3500	10	06/29/07	08/03/07	KWG0707265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	106	18-153	08/03/07	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: NA
 Date Received: NA

Chlorinated Herbicides

Sample Name: Method Blank
 Lab Code: KWG0707265-3
 Extraction Method: METHOD
 Analysis Method: 8151A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
Dicamba	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
MCP	ND	U	5000	1	06/29/07	07/31/07	KWG0707265	
MCPA	ND	U	5000	1	06/29/07	07/31/07	KWG0707265	
Dichlorprop	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
2,4-D	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
2,4,5-TP (Silvex)	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
2,4,5-T	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
2,4-DB	ND	U	25	1	06/29/07	07/31/07	KWG0707265	
Dinoseb	ND	U	25	1	06/29/07	07/31/07	KWG0707265	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	86	18-153	07/31/07	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/19/2007
 Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070806
 Lab Code: K0705409-004
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Phenol	ND	U	1900	20	07/02/07	07/10/07	KWG0707313	
2-Chlorophenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
1,3-Dichlorobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
1,4-Dichlorobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
1,2-Dichlorobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzyl Alcohol	ND	U	1300	20	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroisopropyl) Ether	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Methylphenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Hexachloroethane	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
N-Nitrosodi-n-propylamine	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Methylphenol†	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Nitrobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Isophorone	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Nitrophenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2,4-Dimethylphenol	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroethoxy)methane	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2,4-Dichlorophenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzoic Acid	ND	U	13000	20	07/02/07	07/10/07	KWG0707313	
1,2,4-Trichlorobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Naphthalene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Chloroaniline	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Hexachlorobutadiene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Chloro-3-methylphenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Methylnaphthalene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Hexachlorocyclopentadiene	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
2,4,6-Trichlorophenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2,4,5-Trichlorophenol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Chloronaphthalene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Nitroaniline	ND	U	1300	20	07/02/07	07/10/07	KWG0707313	
Acenaphthylene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Dimethyl Phthalate	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2,6-Dinitrotoluene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070806
Lab Code: K0705409-004
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
3-Nitroaniline	ND	U	1300	20	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrophenol	ND	U	13000	20	07/02/07	07/10/07	KWG0707313	
Dibenzofuran	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Nitrophenol	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrotoluene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Fluorene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Chlorophenyl Phenyl Ether	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Diethyl Phthalate	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Nitroaniline	ND	U	1300	20	07/02/07	07/10/07	KWG0707313	
2-Methyl-4,6-dinitrophenol	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
N-Nitrosodiphenylamine	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
4-Bromophenyl Phenyl Ether	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Hexachlorobenzene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Pentachlorophenol	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
Phenanthrene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Anthracene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Di-n-butyl Phthalate	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Fluoranthene	640	D	610	20	07/02/07	07/10/07	KWG0707313	
Pyrene	1200	D	610	20	07/02/07	07/10/07	KWG0707313	
Butyl Benzyl Phthalate	960	D	610	20	07/02/07	07/10/07	KWG0707313	
3,3'-Dichlorobenzidine	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
Benz(a)anthracene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Chrysene	670	D	610	20	07/02/07	07/10/07	KWG0707313	
Bis(2-ethylhexyl) Phthalate	29000	D	6100	20	07/02/07	07/10/07	KWG0707313	
Di-n-octyl Phthalate	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzo(b)fluoranthene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzo(k)fluoranthene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzo(a)pyrene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Indeno(1,2,3-cd)pyrene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Dibenz(a,h)anthracene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Benzo(g,h,i)perylene	ND	U	610	20	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070806
Lab Code: K0705409-004

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	59	10-86	07/10/07	Acceptable
Phenol-d6	59	17-101	07/10/07	Acceptable
Nitrobenzene-d5	60	10-108	07/10/07	Acceptable
2-Fluorobiphenyl	68	10-108	07/10/07	Acceptable
2,4,6-Tribromophenol	80	21-110	07/10/07	Acceptable
Terphenyl-d14	74	26-122	07/10/07	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070807
Lab Code: K0705409-005
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Phenol	ND	U	210	1	07/02/07	07/10/07	KWG0707313	
2-Chlorophenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
1,3-Dichlorobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
1,4-Dichlorobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
1,2-Dichlorobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzyl Alcohol	ND	U	140	1	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroisopropyl) Ether	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2-Methylphenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Hexachloroethane	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
N-Nitrosodi-n-propylamine	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Methylphenol†	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Nitrobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Isophorone	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2-Nitrophenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2,4-Dimethylphenol	ND	U	350	1	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroethoxy)methane	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2,4-Dichlorophenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzoic Acid	ND	U	1400	1	07/02/07	07/10/07	KWG0707313	
1,2,4-Trichlorobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Naphthalene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Chloroaniline	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Hexachlorobutadiene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Chloro-3-methylphenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2-Methylnaphthalene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Hexachlorocyclopentadiene	ND	U	410	1	07/02/07	07/10/07	KWG0707313	
2,4,6-Trichlorophenol	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2,4,5-Trichlorophenol	78		70	1	07/02/07	07/10/07	KWG0707313	
2-Chloronaphthalene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2-Nitroaniline	ND	U	140	1	07/02/07	07/10/07	KWG0707313	
Acenaphthylene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Dimethyl Phthalate	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
2,6-Dinitrotoluene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/19/2007
 Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070807
 Lab Code: K0705409-005
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
3-Nitroaniline	ND	U	140	1	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrophenol	ND	U	1400	1	07/02/07	07/10/07	KWG0707313	
Dibenzofuran	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Nitrophenol	ND	U	700	1	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrotoluene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Fluorene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Chlorophenyl Phenyl Ether	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Diethyl Phthalate	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Nitroaniline	ND	U	140	1	07/02/07	07/10/07	KWG0707313	
2-Methyl-4,6-dinitrophenol	ND	U	700	1	07/02/07	07/10/07	KWG0707313	
N-Nitrosodiphenylamine	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
4-Bromophenyl Phenyl Ether	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Hexachlorobenzene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Pentachlorophenol	ND	U	700	1	07/02/07	07/10/07	KWG0707313	
Phenanthrene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Anthracene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Di-n-butyl Phthalate	ND	U	120	1	07/02/07	07/10/07	KWG0707313	
Fluoranthene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Pyrene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Butyl Benzyl Phthalate	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
3,3'-Dichlorobenzidine	ND	U	700	1	07/02/07	07/10/07	KWG0707313	
Benz(a)anthracene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Chrysene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Bis(2-ethylhexyl) Phthalate	1600		700	1	07/02/07	07/10/07	KWG0707313	
Di-n-octyl Phthalate	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzo(b)fluoranthene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzo(k)fluoranthene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzo(a)pyrene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Indeno(1,2,3-cd)pyrene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Dibenz(a,h)anthracene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	
Benzo(g,h,i)perylene	ND	U	70	1	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070807
Lab Code: K0705409-005

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	30	10-86	07/10/07	Acceptable
Phenol-d6	38	17-101	07/10/07	Acceptable
Nitrobenzene-d5	25	10-108	07/10/07	Acceptable
2-Fluorobiphenyl	37	10-108	07/10/07	Acceptable
2,4,6-Tribromophenol	66	21-110	07/10/07	Acceptable
Terphenyl-d14	73	26-122	07/10/07	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/20/2007
 Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070809
 Lab Code: K0705409-007
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Phenol	ND	U	910	20	07/02/07	07/10/07	KWG0707313	
2-Chlorophenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
1,3-Dichlorobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
1,4-Dichlorobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
1,2-Dichlorobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Benzyl Alcohol	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroisopropyl) Ether	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2-Methylphenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Hexachloroethane	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
N-Nitrosodi-n-propylamine	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Methylphenol†	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Nitrobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Isophorone	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2-Nitrophenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2,4-Dimethylphenol	ND	U	1600	20	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroethoxy)methane	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2,4-Dichlorophenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Benzoic Acid	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
1,2,4-Trichlorobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Naphthalene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Chloroaniline	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Hexachlorobutadiene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Chloro-3-methylphenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2-Methylnaphthalene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Hexachlorocyclopentadiene	ND	U	1600	20	07/02/07	07/10/07	KWG0707313	
2,4,6-Trichlorophenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2,4,5-Trichlorophenol	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2-Chloronaphthalene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2-Nitroaniline	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
Acenaphthylene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Dimethyl Phthalate	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
2,6-Dinitrotoluene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/20/2007
 Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070809
 Lab Code: K0705409-007
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
3-Nitroaniline	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrophenol	ND	U	6100	20	07/02/07	07/10/07	KWG0707313	
Dibenzofuran	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Nitrophenol	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrotoluene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Fluorene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Chlorophenyl Phenyl Ether	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Diethyl Phthalate	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Nitroaniline	ND	U	610	20	07/02/07	07/10/07	KWG0707313	
2-Methyl-4,6-dinitrophenol	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
N-Nitrosodiphenylamine	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
4-Bromophenyl Phenyl Ether	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Hexachlorobenzene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Pentachlorophenol	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
Phenanthrene	620	D	310	20	07/02/07	07/10/07	KWG0707313	
Anthracene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Di-n-butyl Phthalate	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Fluoranthene	1200	D	310	20	07/02/07	07/10/07	KWG0707313	
Pyrene	1400	D	310	20	07/02/07	07/10/07	KWG0707313	
Butyl Benzyl Phthalate	1600	D	310	20	07/02/07	07/10/07	KWG0707313	
3,3'-Dichlorobenzidine	ND	U	3100	20	07/02/07	07/10/07	KWG0707313	
Benz(a)anthracene	530	D	310	20	07/02/07	07/10/07	KWG0707313	
Chrysene	830	D	310	20	07/02/07	07/10/07	KWG0707313	
Bis(2-ethylhexyl) Phthalate	16000	D	3100	20	07/02/07	07/10/07	KWG0707313	
Di-n-octyl Phthalate	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Benzo(b)fluoranthene	930	D	310	20	07/02/07	07/10/07	KWG0707313	
Benzo(k)fluoranthene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Benzo(a)pyrene	640	D	310	20	07/02/07	07/10/07	KWG0707313	
Indeno(1,2,3-cd)pyrene	620	D	310	20	07/02/07	07/10/07	KWG0707313	
Dibenz(a,h)anthracene	ND	U	310	20	07/02/07	07/10/07	KWG0707313	
Benzo(g,h,i)perylene	660	D	310	20	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/20/2007
Date Received: 06/22/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 070809
Lab Code: K0705409-007

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	53	10-86	07/10/07	Acceptable
Phenol-d6	58	17-101	07/10/07	Acceptable
Nitrobenzene-d5	58	10-108	07/10/07	Acceptable
2-Fluorobiphenyl	66	10-108	07/10/07	Acceptable
2,4,6-Tribromophenol	73	21-110	07/10/07	Acceptable
Terphenyl-d14	75	26-122	07/10/07	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: NA
 Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
 Lab Code: KWG0707313-5
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Phenol	ND	U	15	1	07/02/07	07/10/07	KWG0707313	
2-Chlorophenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
1,3-Dichlorobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
1,4-Dichlorobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
1,2-Dichlorobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzyl Alcohol	ND	U	9.9	1	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroisopropyl) Ether	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2-Methylphenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Hexachloroethane	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
N-Nitrosodi-n-propylamine	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Methylphenol†	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Nitrobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Isophorone	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2-Nitrophenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2,4-Dimethylphenol	ND	U	25	1	07/02/07	07/10/07	KWG0707313	
Bis(2-chloroethoxy)methane	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2,4-Dichlorophenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzoic Acid	ND	U	99	1	07/02/07	07/10/07	KWG0707313	
1,2,4-Trichlorobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Naphthalene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Chloroaniline	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Hexachlorobutadiene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Chloro-3-methylphenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2-Methylnaphthalene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Hexachlorocyclopentadiene	ND	U	29	1	07/02/07	07/10/07	KWG0707313	
2,4,6-Trichlorophenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2,4,5-Trichlorophenol	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2-Chloronaphthalene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2-Nitroaniline	ND	U	9.9	1	07/02/07	07/10/07	KWG0707313	
Acenaphthylene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Dimethyl Phthalate	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
2,6-Dinitrotoluene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: NA
 Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
 Lab Code: KWG0707313-5
 Extraction Method: EPA 3541
 Analysis Method: 8270C

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
3-Nitroaniline	ND	U	9.9	1	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrophenol	ND	U	99	1	07/02/07	07/10/07	KWG0707313	
Dibenzofuran	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Nitrophenol	ND	U	50	1	07/02/07	07/10/07	KWG0707313	
2,4-Dinitrotoluene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Fluorene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Chlorophenyl Phenyl Ether	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Diethyl Phthalate	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Nitroaniline	ND	U	9.9	1	07/02/07	07/10/07	KWG0707313	
2-Methyl-4,6-dinitrophenol	ND	U	50	1	07/02/07	07/10/07	KWG0707313	
N-Nitrosodiphenylamine	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
4-Bromophenyl Phenyl Ether	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Hexachlorobenzene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Pentachlorophenol	ND	U	50	1	07/02/07	07/10/07	KWG0707313	
Phenanthrene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Anthracene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Di-n-butyl Phthalate	ND	U	7.9	1	07/02/07	07/10/07	KWG0707313	
Fluoranthene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Pyrene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Butyl Benzyl Phthalate	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
3,3'-Dichlorobenzidine	ND	U	50	1	07/02/07	07/10/07	KWG0707313	
Benz(a)anthracene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Chrysene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Bis(2-ethylhexyl) Phthalate	ND	U	50	1	07/02/07	07/10/07	KWG0707313	
Di-n-octyl Phthalate	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzo(b)fluoranthene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzo(k)fluoranthene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzo(a)pyrene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Dibenz(a,h)anthracene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	
Benzo(g,h,i)perylene	ND	U	5.0	1	07/02/07	07/10/07	KWG0707313	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0707313-5

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	28	10-86	07/10/07	Acceptable
Phenol-d6	40	17-101	07/10/07	Acceptable
Nitrobenzene-d5	30	10-108	07/10/07	Acceptable
2-Fluorobiphenyl	44	10-108	07/10/07	Acceptable
2,4,6-Tribromophenol	58	21-110	07/10/07	Acceptable
Terphenyl-d14	69	26-122	07/10/07	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/19/2007
 Date Received: 06/22/2007

Polynuclear Aromatic Hydrocarbons

Sample Name: FO 070806
 Lab Code: K0705409-004
 Extraction Method: EPA 3541
 Analysis Method: 8270C SIM

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	680	D	38	5	07/02/07	07/16/07	KWG0707314	
2-Methylnaphthalene	99	D	38	5	07/02/07	07/16/07	KWG0707314	
Acenaphthylene	58	D	38	5	07/02/07	07/16/07	KWG0707314	
Acenaphthene	ND	U	38	5	07/02/07	07/16/07	KWG0707314	
Fluorene	87	D	38	5	07/02/07	07/16/07	KWG0707314	
Dibenzofuran	45	D	38	5	07/02/07	07/16/07	KWG0707314	
Phenanthrene	520	D	38	5	07/02/07	07/16/07	KWG0707314	
Anthracene	110	D	38	5	07/02/07	07/16/07	KWG0707314	
Fluoranthene	900	D	38	5	07/02/07	07/16/07	KWG0707314	
Pyrene	1100	D	38	5	07/02/07	07/16/07	KWG0707314	
Benzo(b)fluoranthene	570	D	38	5	07/02/07	07/16/07	KWG0707314	
Benzo(k)fluoranthene	160	D	38	5	07/02/07	07/16/07	KWG0707314	
Benz(a)anthracene	340	D	38	5	07/02/07	07/16/07	KWG0707314	
Chrysene	450	D	38	5	07/02/07	07/16/07	KWG0707314	
Benzo(a)pyrene	410	D	38	5	07/02/07	07/16/07	KWG0707314	
Indeno(1,2,3-cd)pyrene	510	D	160	20	07/02/07	07/14/07	KWG0707314	
Dibenz(a,h)anthracene	180	D	160	20	07/02/07	07/14/07	KWG0707314	
Benzo(g,h,i)perylene	750	D	160	20	07/02/07	07/14/07	KWG0707314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	10-123	07/16/07	Acceptable
Fluoranthene-d10	97	10-136	07/16/07	Acceptable
Terphenyl-d14	86	32-123	07/16/07	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Polynuclear Aromatic Hydrocarbons

Sample Name: FO 070807
Lab Code: K0705409-005
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
2-Methylnaphthalene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Acenaphthylene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Acenaphthene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Fluorene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Dibenzofuran	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Phenanthrene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Anthracene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Fluoranthene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Pyrene	38		18	1	07/02/07	07/18/07	KWG0707314	
Benzo(b)fluoranthene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Benzo(k)fluoranthene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Benz(a)anthracene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Chrysene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Benzo(a)pyrene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Indeno(1,2,3-cd)pyrene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Dibenz(a,h)anthracene	ND	U	18	1	07/02/07	07/18/07	KWG0707314	
Benzo(g,h,i)perylene	24		18	1	07/02/07	07/18/07	KWG0707314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	63	10-123	07/18/07	Acceptable
Fluoranthene-d10	78	10-136	07/18/07	Acceptable
Terphenyl-d14	81	32-123	07/18/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0705409
 Date Collected: 06/20/2007
 Date Received: 06/22/2007

Polynuclear Aromatic Hydrocarbons

Sample Name: FO 070809
 Lab Code: K0705409-007
 Extraction Method: EPA 3541
 Analysis Method: 8270C SIM

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	240	D	19	5	07/02/07	07/16/07	KWG0707314	
2-Methylnaphthalene	49	D	19	5	07/02/07	07/16/07	KWG0707314	
Acenaphthylene	50	D	19	5	07/02/07	07/16/07	KWG0707314	
Acenaphthene	51	D	19	5	07/02/07	07/16/07	KWG0707314	
Fluorene	50	D	19	5	07/02/07	07/16/07	KWG0707314	
Dibenzofuran	40	D	19	5	07/02/07	07/16/07	KWG0707314	
Phenanthrene	690	D	19	5	07/02/07	07/16/07	KWG0707314	
Anthracene	150	D	19	5	07/02/07	07/16/07	KWG0707314	
Fluoranthene	1600	D	19	5	07/02/07	07/16/07	KWG0707314	
Pyrene	1300	D	19	5	07/02/07	07/16/07	KWG0707314	
Benzo(b)fluoranthene	820	D	19	5	07/02/07	07/16/07	KWG0707314	
Benzo(k)fluoranthene	240	D	19	5	07/02/07	07/16/07	KWG0707314	
Benz(a)anthracene	520	D	19	5	07/02/07	07/16/07	KWG0707314	
Chrysene	840	D	19	5	07/02/07	07/16/07	KWG0707314	
Benzo(a)pyrene	570	D	19	5	07/02/07	07/16/07	KWG0707314	
Indeno(1,2,3-cd)pyrene	700	D	76	20	07/02/07	07/14/07	KWG0707314	
Dibenz(a,h)anthracene	150	D	76	20	07/02/07	07/14/07	KWG0707314	
Benzo(g,h,i)perylene	720	D	76	20	07/02/07	07/14/07	KWG0707314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	72	10-123	07/16/07	Acceptable
Fluoranthene-d10	85	10-136	07/16/07	Acceptable
Terphenyl-d14	77	32-123	07/16/07	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: NA
Date Received: NA

Polynuclear Aromatic Hydrocarbons

Sample Name: Method Blank
Lab Code: KWG0707314-3
Extraction Method: EPA 3541
Analysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
2-Methylnaphthalene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Acenaphthylene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Acenaphthene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Fluorene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Dibenzofuran	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Phenanthrene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Anthracene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Fluoranthene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Pyrene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Benzo(b)fluoranthene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Benzo(k)fluoranthene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Benz(a)anthracene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Chrysene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Benzo(a)pyrene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Indeno(1,2,3-cd)pyrene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Dibenz(a,h)anthracene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	
Benzo(g,h,i)perylene	ND	U	1.3	1	07/02/07	07/14/07	KWG0707314	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	63	10-123	07/14/07	Acceptable
Fluoranthene-d10	82	10-136	07/14/07	Acceptable
Terphenyl-d14	82	32-123	07/14/07	Acceptable

Comments: _____

Revised Laboratory Report for PCB Aroclors

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Polychlorinated Biphenyls (PCBs)

Sample Name: FO 070805
Lab Code: K0705409-003
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	53	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1221	ND	Ui	140	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1232	ND	Ui	100	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1242	ND	Ui	70	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1248	ND	U	53	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1254	ND	Ui	95	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1260	ND	Ui	78	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1262	ND	Ui	110	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1268	ND	Ui	68	1	07/02/07	07/24/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	51	33-141	07/24/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Polychlorinated Biphenyls (PCBs)

Sample Name: FO 070806
Lab Code: K0705409-004
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1221	ND	U	190	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1232	ND	U	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1242	ND	U	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1248	800	D	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1254	ND	U	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1260	400	D	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1262	ND	U	93	10	07/02/07	07/26/07	KWG0707164	
Aroclor 1268	180	PD	93	10	07/02/07	07/26/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	141	33-141	07/26/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/19/2007
Date Received: 06/22/2007

Polychlorinated Biphenyls (PCBs)

Sample Name: FO 070807
Lab Code: K0705409-005
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	67	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1221	ND	Ui	93	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1232	ND	Ui	190	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1242	ND	Ui	140	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1248	ND	Ui	86	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1254	250		35	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1260	93		35	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1262	ND	Ui	62	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1268	ND	U	35	1	07/02/07	07/24/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	66	33-141	07/24/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/20/2007
Date Received: 06/22/2007

Polychlorinated Biphenyls (PCBs)

Sample Name: FO 070808
Lab Code: K0705409-006
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1221	ND	U	31	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1232	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1242	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1248	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1254	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1260	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1262	ND	U	16	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1268	ND	U	16	1	07/02/07	07/24/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	71	33-141	07/24/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: 06/20/2007
Date Received: 06/22/2007

Polychlorinated Biphenyls (PCBs)

Sample Name: FO 070809
Lab Code: K0705409-007
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1221	ND	U	16	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1232	ND	U	7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1242	ND	U	7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1248	190		7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1254	ND	U	7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1260	210		7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1262	ND	U	7.6	1	07/02/07	07/26/07	KWG0707164	
Aroclor 1268	ND	Ui	8.6	1	07/02/07	07/26/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	95	33-141	07/26/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0705409
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank
Lab Code: KWG0707164-4
Extraction Method: EPA 3540C
Analysis Method: 8082

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1221	ND	U	5.0	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1232	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1242	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1248	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1254	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1260	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1262	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	
Aroclor 1268	ND	U	2.5	1	07/02/07	07/24/07	KWG0707164	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	75	33-141	07/24/07	Acceptable

Comments:

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/18/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708010	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613931	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072407.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072407.B\0724F009.D	Instrument:	GC09.i
Data File #2:	\\cash1\acquadata\GC09\data\072407_r.b\0724R009.D	Vial:	7
Acqu Date:	07/24/2007 15:12	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-002	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2			Rpt
Decachlorobiphenyl	18.59 ^{+0.02}	20.19 ^{+0.00}	605621	300143m	93.78	60.92			94OK ✓
%Recovery =					94OK	61OK	Limits =	33-141	

Target Compounds

Final Conc. Units: ug/Kg Dry Weight									
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	74.89	125.54	20Ui	34Ui	20Ui ✓
Aroclor 1016 {1}	6.72 ^{-0.01}	6.70 ^{-0.05} c	17341m	10245m	121.19	117.20	4.5Ui	4.5Ui	
Aroclor 1016 {2}	7.36 ^{+0.07} c	7.70 ^{-0.07} c	0m	13992m	0.0000	78.34	4.5Ui	4.5Ui	
Aroclor 1016 {3}	7.70 ^{+0.00} c	8.08 ^{+0.08} c	4895m	19578m	35.08	164.33	4.5Ui	4.5Ui	
Aroclor 1016 {4}	8.17 ^{+0.03} c	8.33 ^{+0.04} c	12885m	15906m	69.02	142.29	4.5Ui	4.5Ui	
Aroclor 1016 {5}	8.45 ^{+0.00} c	8.50 ^{-0.09} c	10102m	0m	74.27	0.0000	4.5Ui	4.5Ui	
Aroclor 1221			0	0	126.44	111.95	34Ui	30Ui	30Ui ✓
Aroclor 1221 {1}	4.06	4.32	1008m	3129m	15.42	65.34	4.5Ui	4.5Ui	
Aroclor 1221 {2}	5.01	5.24	7138m	0m	188.93	0.0000	4.5Ui	4.5Ui	
Aroclor 1221 {3}	5.23	5.77	3523m	7857m	42.32	150.29	4.5Ui	4.5Ui	
Aroclor 1221 {4}	5.44	5.84	14000m	4314m	259.07	120.21	4.5Ui	4.5Ui	
Aroclor 1232			0	0	32.25	110.27	8.6Ui	30Ui	8.6Ui ✓
Aroclor 1232 {1}	5.54	6.04	5381m	4926m	31.15	44.42	4.5Ui	4.5Ui	
Aroclor 1232 {2}	6.26 ^c	6.70 ^c	0m	10245m	0.0000	219.23	4.5Ui	4.5Ui	
Aroclor 1232 {3}	7.10 ^c	7.00 ^c	8818m	2413m	33.35	35.89	4.5Ui	4.5Ui	
Aroclor 1232 {4}	7.36 ^c	7.70 ^c	0m	13992m	0.0000	141.55	4.5Ui	4.5Ui	
Aroclor 1242			0	0	57.69	124.27	16Ui	33Ui	16Ui ✓
Aroclor 1242 {1}	6.26 ^c	6.70 ^c	0m	10245m	0.0000	116.35	4.5Ui	4.5Ui	
Aroclor 1242 {2}	7.10 ^c	7.00 ^c	8818m	2413m	18.60	23.75	4.5Ui	4.5Ui	
Aroclor 1242 {3}	7.36 ^c	7.70 ^c	0m	13992m	0.0000	104.52	4.5Ui	4.5Ui	

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072407.B\0724F009.D	Instrument:	GC09.i
Data File #2:	\\cash1\acqdata\GC09\data\072407_r.b\0724R009.D	Vial:	7
Acqu Date:	07/24/2007 15:12	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-002	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}	7.61	8.08	c	10539m	19578m	63.70	212.14	4.5Ui	4.5Ui
Aroclor 1242 {5}	8.17	c	8.19	12885m	11879m	90.76	164.61	4.5Ui	4.5Ui
Aroclor 1248				0	0	47.65	66.29	13Ui	18Ui
Aroclor 1248 {1}	7.70	c	8.33	c	4895m	15906m	31.04	126.59	4.5Ui
Aroclor 1248 {2}	8.17	c	8.50	c	12885m	0m	58.71	0.0000	4.5Ui
Aroclor 1248 {3}	8.45	c	9.42		10102m	9272m	52.51	32.83	4.5Ui
Aroclor 1248 {4}	8.82		9.56		11328m	7569m	40.30	39.45	4.5Ui
Aroclor 1248 {5}	8.92		9.83	c	19764m	0m	55.68	0.0000	4.5Ui
Aroclor 1254					0	0	55.55	524.11	15Ui
Aroclor 1254 {1}	9.17		9.83	c	11651m	0m	37.65	0.0000	4.5Ui
Aroclor 1254 {2}	9.87		10.35		0m	116467m	0.0000	939.32	4.5Ui
Aroclor 1254 {3}	10.13		10.64		35637m	29221m	71.44	115.42	4.5Ui
Aroclor 1254 {4}	10.53		11.02	c	22274m	0m	57.57	0.0000	4.5Ui
Aroclor 1254 {5}	10.76	c	11.21		0m	105703m	0.0000	517.60	4.5Ui
Aroclor 1260					0	0	70.93	74.95	19Ui
Aroclor 1260 {1}	10.43	^{+0.00}	11.02	^{+0.03} c	20199m	0m	51.94	0.0000	4.5Ui
Aroclor 1260 {2}	10.76	^{+0.01} c	11.53	^{+0.00}	0m	25247m	0.0000	95.16	4.5Ui
Aroclor 1260 {3}	11.55	c	12.21	^{0.00}	50903m	30600m	118.53	92.62	4.5Ui
Aroclor 1260 {4}	12.34	^{-0.01} c	12.43	c	19670m	6261m	69.75	35.28	4.5Ui
Aroclor 1260 {5}	12.89	c	13.89	^{-0.01} c	25752m	31391m	43.50	76.75	4.5Ui
Aroclor 1262					0	0	85.05	92.65	24
Aroclor 1262 {1}	11.55	c	12.43	c	50903m	6261m	118.28	22.91	31
Aroclor 1262 {2}	12.34	c	13.02		19670m	23147m	58.58	110.50	15
Aroclor 1262 {3}	12.89	c	13.89	c	25752m	31391m	38.53	66.43	10J
Aroclor 1262 {4}	13.82		14.90		36361m	57192m	124.81	160.54	33
Aroclor 1262 {5}	14.06	c	15.15	c	0m	25476m	0.0000	102.89	4.5U
Aroclor 1268					0	0	30.74	36.67	8.1J
Aroclor 1268 {1}	14.06	c	15.15	c	0m	25476m	0.0000	42.35	4.5U
Aroclor 1268 {2}	14.78		16.00		225m	3194m	0.3440	6.52	4.5U
Aroclor 1268 {3}	15.25		16.41		7866m	8422m	47.40	62.38	13J
Aroclor 1268 {4}	15.88		17.25		12706m	7459m	44.46	35.41	12J
Aroclor 1268 {5}			18.83		0m	0m	0.0000	0.0000	4.5U

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount:	20.00 g	Dilution:	1.0
Prep Final Vol:	2 ml	Unit Factor:	1
Solids:	37.9 %		

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/19/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708010	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613932	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072407.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072407.B\0724F010.D	Instrument:	GC09.i
Data File #2:	\\cash1\acq\data\GC09\data\072407_r.b\0724R010.D	Vial:	8
Acqu Date:	07/24/2007 15:38	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-003	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	Rpt		
Decachlorobiphenyl	18.58 ^{+0.01}	20.19 ^{0.00}	327557m	178453	50.72	36.22	51OK	33-141	51OK ✓
%Recovery =					51OK	36OK	Limits =	33-141	

Target Compounds

							Final Conc. Units:		ug/Kg Dry Weight		
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt		
Aroclor 1016			0	0	33.62	40.76	36Ui	44Ui	36Ui		
Aroclor 1016 {1}	6.82 ^{+0.09}	6.68 ^{-0.06} c	0m	2122m	0.0000	24.28	9.1Ui	9.1Ui			
Aroclor 1016 {2}	7.37 ^{+0.08} c	7.78 ^{+0.01} c	0m	7913m	0.0000	44.31	9.1Ui	9.1Ui			
Aroclor 1016 {3}	7.70 ^{0.00} c	8.09 ^{+0.08} c	2638m	0m	18.91	0.0000	9.1Ui	9.1Ui			
Aroclor 1016 {4}	8.15 ^{+0.01} c	8.29 ^{0.00} c	8663m	6000m	46.40	53.68	9.1Ui	9.1Ui			
Aroclor 1016 {5}	8.45 ^{+0.01} c	8.50 ^{-0.09} c	4835m	0m	35.55	0.0000	9.1Ui	9.1Ui			
Aroclor 1221			0	0	125.66	207.60	140Ui	220Ui	140Ui		
Aroclor 1221 {1}		4.32	0	8087	0.0000	168.87	9.1Ui	9.1Ui			
Aroclor 1221 {2}	4.94	5.26	3734	6980	98.82	300.53	9.1Ui	9.1Ui			
Aroclor 1221 {3}	5.24	5.65	21718	18747	260.83	358.60	9.1Ui	9.1Ui			
Aroclor 1221 {4}	5.43	5.84	936	86	17.32	2.40	9.1Ui	9.1Ui			
Aroclor 1232			0	0	95.32	93.67	110Ui	100Ui	100Ui		
Aroclor 1232 {1}	5.55	6.04	10915m	1707m	63.19	15.39	9.1Ui	9.1Ui			
Aroclor 1232 {2}	6.31 ^c	6.68 ^c	0m	2122m	0.0000	45.42	9.1Ui	9.1Ui			
Aroclor 1232 {3}	7.16 ^c	7.02 ^c	33706m	13543m	127.46	201.43	9.1Ui	9.1Ui			
Aroclor 1232 {4}	7.37 ^c	7.70 ^c	0m	11113m	0.0000	112.42	9.1Ui	9.1Ui			
Aroclor 1242			0	0	66.05	72.16	70Ui	77Ui	70Ui		
Aroclor 1242 {1}	6.31 ^c	6.68 ^c	0m	2122m	0.0000	24.11	9.1Ui	9.1Ui			
Aroclor 1242 {2}	7.16 ^c	7.02 ^c	33706m	13543m	71.08	133.28	9.1Ui	9.1Ui			
Aroclor 1242 {3}	7.37 ^c	7.78 ^c	0m	7913m	0.0000	59.11	9.1Ui	9.1Ui			

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072407.B\0724F010.D	Instrument:	GC09.i
Data File #2:	\\cash1\acquadata\GC09\data\072407_r.b\0724R010.D	Vial:	8
Acqu Date:	07/24/2007 15:38	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-003	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}		7.92	0m	0m	0.0000	0.0000	9.1Ui	9.1Ui	
Aroclor 1242 {5}	8.15	c 8.09	c 8663m	0m	61.02	0.0000	9.1Ui	9.1Ui	
Aroclor 1248			0	0	47.72	145.05	51Ui	160Ui	51Ui
Aroclor 1248 {1}	7.70	c 8.29	c 2638m	6000m	16.73	47.76	9.1Ui	9.1Ui	
Aroclor 1248 {2}	8.15	c 8.50	c 8663m	0m	39.48	0.0000	9.1Ui	9.1Ui	
Aroclor 1248 {3}	8.45	c 9.48	4835m	37264m	25.13	131.94	9.1Ui	9.1Ui	
Aroclor 1248 {4}	8.83		24719m	0m	87.93	0.0000	9.1Ui	9.1Ui	
Aroclor 1248 {5}	8.92	9.85	c 24608m	36476m	69.33	255.47	9.1Ui	9.1Ui	
Aroclor 1254			0	0	89.26	137.47	95Ui	150Ui	95Ui
Aroclor 1254 {1}	9.17	9.85	c 15696m	36476m	50.72	151.43	9.1Ui	9.1Ui	
Aroclor 1254 {2}	9.90	10.35	0m	0m	0.0000	0.0000	9.1Ui	9.1Ui	
Aroclor 1254 {3}	10.13	10.64	30759m	18471m	61.66	72.96	9.1Ui	9.1Ui	
Aroclor 1254 {4}	10.53	10.99	c 20491m	17358m	52.96	150.48	9.1Ui	9.1Ui	
Aroclor 1254 {5}	10.75	c 11.25	36106m	35741m	191.70	175.01	9.1Ui	9.1Ui	
Aroclor 1260			0	0	72.98	107.22	78Ui	120Ui	78Ui
Aroclor 1260 {1}	10.43	^{+0.00} 10.99	^{+0.00} c 23055m	17358m	59.28	73.68	9.1Ui	9.1Ui	
Aroclor 1260 {2}	10.75	^{+0.00} c 11.53	^{+0.00} 36106m	31422m	81.28	118.44	9.1Ui	9.1Ui	
Aroclor 1260 {3}	11.55	^{-0.01} c 12.21	^{-0.01} 0m	51320m	0.0000	155.33	9.1Ui	9.1Ui	
Aroclor 1260 {4}	12.35	^{0.00} c 12.42	^{0.00} c 19040m	12929m	67.52	72.85	9.1Ui	9.1Ui	
Aroclor 1260 {5}	12.89	^{0.00} c 13.89	^{-0.01} c 49619m	47372m	83.82	115.82	9.1Ui	9.1Ui	
Aroclor 1262			0	0	107.99	94.68	110	100	110
Aroclor 1262 {1}	11.55	c 12.42	c 0m	12929m	0.0000	47.31	9.1U	50J	
Aroclor 1262 {2}	12.35	c 13.02	19040m	25159m	56.70	120.11	60	130	
Aroclor 1262 {3}	12.89	c 13.89	c 49619m	47372m	74.23	100.25	79	110	
Aroclor 1262 {4}	13.86	14.88	36043m	50668m	123.72	142.23	130	150	
Aroclor 1262 {5}	14.06	c 15.15	c 92511m	15722m	177.32	63.49	190	67	
Aroclor 1268			0	0	85.88	63.29	91	67	91
Aroclor 1268 {1}	14.06	c 15.15	c 92511m	15722m	113.03	26.14	120	28J	RPD
Aroclor 1268 {2}	14.77		871m	0m	1.33	0.0000	9.1U	9.1U	
Aroclor 1268 {3}	15.25	16.40	20351m	16649m	122.64	123.31	130	130	
Aroclor 1268 {4}	15.78	17.24	53626m	11262m	187.64	53.47	200	57	RPD
Aroclor 1268 {5}	17.24	18.82	9065m	72228m	4.76	50.25	9.1U	53	

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount: 8.63 g Dilution: 1.0
 Prep Final Vol: 5 ml Unit Factor: 1
 Solids: 54.7 %

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/19/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708132	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613933	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072607.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072607.B\0726F009.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R009.D	Vial:	5
Acqu Date:	07/26/2007 20:37	Quant Date:	07/31/2007 13:47
Run Type:	SMPL	Dilution:	10.0
Lab ID:	K0705409-004	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2			Rpt
Decachlorobiphenyl	18.57 ^{+0.01}	20.18 ^{0.00}	91294	46573	14.14	9.45			141OK ✓
%Recovery =					141OK	95OK	Limits =	33-141	

Target Compounds

								Final Conc. Units:	ug/Kg Dry Weight
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1016 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1016 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1016 {3}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1016 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1016 {5}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1221			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1221 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1221 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1221 {3}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1221 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1232			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1232 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1232 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1232 {3}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1232 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1242			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1242 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1242 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1242 {3}			0d	0d	0.0000	0.0000	32U	32U	

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E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072607.B\0726F009.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R009.D	Vial:	5
Acqu Date:	07/26/2007 20:37	Quant Date:	07/31/2007 13:47
Run Type:	SMPL	Dilution:	10.0
Lab ID:	K0705409-004	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1242 {5}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1248			0	0	302.11	432.71	560D	800D	800D ✓
Aroclor 1248 {1}	7.70	8.29	46526m	47005	294.99	374.08	550D	690D	
Aroclor 1248 {2}	8.14	8.59	63481m	75981	289.26	591.26	530D	1100D	
Aroclor 1248 {3}	8.44	9.45	48816m	122258	253.72	432.88	470D	800D	
Aroclor 1248 {4}	8.82	9.56	83844m	63811	298.26	332.60	550D	620D	
Aroclor 1248 {5}	8.92	9.85	132870m	0	374.30	0.0000	690D	32U	
Aroclor 1254			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1254 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1254 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1254 {3}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1254 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1254 {5}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1260			0	0	216.54	218.58	400D	400D	400D ✓
Aroclor 1260 {1}	10.43 ^{+0.00}	10.99	78989m	50524	203.11	214.46	380D	400D	
Aroclor 1260 {2}	10.75	11.53	111706m	62246	251.46	234.61	460D	430D	
Aroclor 1260 {3}	11.55	12.21 ^{0.00}	109689m	77678	255.41	235.11	470D	430D	
Aroclor 1260 {4}	12.34 ^{-0.01}	12.42	49324m	38050	174.90	214.39	320D	400D	
Aroclor 1260 {5}	12.89	13.89	117104m	79474	197.82	194.31	370D	360D	
Aroclor 1262			0	0	0.0000	0.0000	32U	32U	32U
Aroclor 1262 {1}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1262 {2}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1262 {3}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1262 {4}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1262 {5}			0d	0d	0.0000	0.0000	32U	32U	
Aroclor 1268			0	0	59.59	98.04	110D	180D	180PD ✓
Aroclor 1268 {1}	14.04	15.15	0	73376	0.0000	121.98	32U	230D	
Aroclor 1268 {2}	14.86	16.02	22983	24470	35.14	49.95	65JD	92JD	
Aroclor 1268 {3}	15.23	16.40	13487	19976	81.28	147.96	150D	270D	
Aroclor 1268 {4}	15.87	17.24	0	0	0.0000	0.0000	32U	32U	
Aroclor 1268 {5}	17.24	18.78	118776	103877	62.34	72.27	120D	130D	

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount:	20.03 g	Dilution:	10.0
Prep Final Vol:	2 ml	Unit Factor:	1
Solids:	54.0 %		

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

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J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/19/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708010	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613934	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072407.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072407.B\0724F011.D	Instrument:	GC09.i
Data File #2:	\\cash1\acq\data\GC09\data\072407_r.b\0724R011.D	Vial:	9
Acqu Date:	07/24/2007 16:05	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-005	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2			Rpt
Decachlorobiphenyl	18.57	20.19 ^{0.00}	424692	264042	65.76	53.59			66OK ✓
%Recovery =					66OK	54OK	Limits =	33-141	

Target Compounds

Final Conc. Units: ug/Kg Dry Weight									
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	95.63	145.61	67Ui	110Ui	67Ui ✓
Aroclor 1016 {1}	6.82 ^{+0.09}	6.77 ^{+0.02}	0m	14132m	0.0000	161.68	24Ui	24Ui	
Aroclor 1016 {2}	7.29 ^c	7.71 ^{-0.07c}	14450m	10277m	51.76	57.55	24Ui	24Ui	
Aroclor 1016 {3}	7.70 ^{0.00c}	7.94 ^{-0.07c}	12106m	0m	86.74	0.0000	24Ui	24Ui	
Aroclor 1016 {4}	8.14 ^c	8.29 ^{0.00c}	24846m	27791m	133.08	248.62	24Ui	24Ui	
Aroclor 1016 {5}	8.44 ^c	8.68 ^{+0.09}	15092m	11543m	110.95	114.59	24Ui	24Ui	
Aroclor 1221			0	0	228.94	132.63	160Ui	93Ui	93Ui ✓
Aroclor 1221 {1}	4.01	4.37	581	975m	8.89	20.36	24Ui	24Ui	
Aroclor 1221 {2}	5.02	5.27	12184	5562m	322.46	239.47	24Ui	24Ui	
Aroclor 1221 {3}	5.24	5.79	0	7217m	0.0000	138.05	24Ui	24Ui	
Aroclor 1221 {4}	5.45		19211	0m	355.49	0.0000	24Ui	24Ui	
Aroclor 1232			0	0	363.05	268.69	260Ui	190Ui	190Ui ✓
Aroclor 1232 {1}	5.66	6.04	0m	13989m	0.0000	126.14	24Ui	24Ui	
Aroclor 1232 {2}	6.25 ^c	6.64 ^c	13727m	26915m	93.46	575.97	24Ui	24Ui	
Aroclor 1232 {3}	7.16 ^c	7.02 ^c	229512m	0m	867.89	0.0000	24Ui	24Ui	
Aroclor 1232 {4}	7.29 ^c	7.71 ^c	14450m	10277m	127.81	103.97	24Ui	24Ui	
Aroclor 1242			0	0	195.84	191.22	140Ui	140Ui	140Ui ✓
Aroclor 1242 {1}	6.25 ^c	6.64 ^c	13727m	26915m	54.39	305.67	24Ui	24Ui	
Aroclor 1242 {2}	7.16 ^c	7.02 ^c	229512m	0m	484.01	0.0000	24Ui	24Ui	
Aroclor 1242 {3}	7.29 ^c	7.71 ^c	14450m	10277m	69.96	76.77	24Ui	24Ui	

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072407.B\0724F011.D	Instrument:	GC09.i
Data File #2:	\\cash1\acquadata\GC09\data\072407_r.b\0724R011.D	Vial:	9
Acqu Date:	07/24/2007 16:05	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-005	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}		7.94	c	0m	0m	0.0000	0.0000	24Ui	24Ui
Aroclor 1242 {5}	8.14	c	8.09	24846m	0m	175.01	0.0000	24Ui	24Ui
Aroclor 1248				0	0	122.09	564.89	86Ui	400Ui
Aroclor 1248 {1}	7.70	c	8.29	c	12106m	27791m	76.76	221.18	24Ui
Aroclor 1248 {2}	8.14	c	8.50	24846m	173346m	113.22	1,349	24Ui	24Ui
Aroclor 1248 {3}	8.44	c	9.44	15092m	66712m	78.44	236.21	24Ui	24Ui
Aroclor 1248 {4}	8.82		9.56	43452m	29131m	154.57	151.84	24Ui	24Ui
Aroclor 1248 {5}	8.92		9.85	c	66539m	123696m	187.45	866.31	24Ui
Aroclor 1254				0	0	243.87	365.74	170	250
Aroclor 1254 {1}	9.18		9.85	c	47771m	123696m	154.37	513.53	110
Aroclor 1254 {2}	9.89		10.39		100473m	0m	493.61	0.0000	340
Aroclor 1254 {3}	10.13		10.63		93350m	94432m	187.13	372.99	130
Aroclor 1254 {4}	10.53		10.99	c	52728m	33581m	136.27	291.11	95
Aroclor 1254 {5}	10.75	c	11.25		46699m	58267m	247.94	285.32	170
Aroclor 1260				0	0	97.06 ^{CCV}	133.51	68	93
Aroclor 1260 {1}	10.43	^{+0.00}	10.99	c	31232m	33581m	80.31	142.55	56
Aroclor 1260 {2}	10.75	c	11.53		46699m	45426m	105.13	171.22	73
Aroclor 1260 {3}	11.55	c	12.21	^{-0.01}	65838m	54274m	153.30	164.27	110
Aroclor 1260 {4}	12.35	^{0.00}	12.42	^{0.00} c	18345m	17250m	65.05	97.19	45
Aroclor 1260 {5}	12.89	c	13.89	^{0.00} c	48240m	37759m	81.49	92.32	57
Aroclor 1262				0	0	88.71	90.69	62	63
Aroclor 1262 {1}	11.55	c	12.42	c	65838m	17250m	152.98	63.12	110
Aroclor 1262 {2}	12.35	c	13.01		18345m	30178m	54.63	144.07	38
Aroclor 1262 {3}	12.89	c	13.89	c	48240m	37759m	72.17	79.90	50
Aroclor 1262 {4}	13.83		14.89		18298m	33451m	62.81	93.90	44
Aroclor 1262 {5}	14.05	c	15.15	c	52666m	17946m	100.95	72.48	70
Aroclor 1268				0	0	37.21	50.96	26J	35
Aroclor 1268 {1}	14.05	c	15.15	c	52666	17946m	64.35	29.83	45
Aroclor 1268 {2}	14.86		15.96		6044	0m	9.24	0.0000	24U
Aroclor 1268 {3}	15.26		16.43		5491	8135m	33.09	60.25	24U
Aroclor 1268 {4}	15.87		17.24		15396	19651m	53.87	93.30	38
Aroclor 1268 {5}	17.24		18.80		48537	29391m	25.48	20.45	24U

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount: 40.00 g Dilution: 1.0
 Prep Final Vol: 2 ml Unit Factor: 1
 Solids: 7.18 %

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
 J: Analyte detected above MDL, but below MRL
 B: Hit above MRL also found in Method Blank
 E: Analyte concentration above high point of ICAL
 N: Presumptive evidence of compound

D: Result from dilution
 m: Manual integration performed
 d: Compound manually deleted
 NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
 #: Acceptance criteria not applicable
 ?: Insufficient information to determine acceptance
 e: Result >= MRL, but MRL less than low point of ICAL
 c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/20/2007	Receive Date:	06/22/2007
Analysis Lot:	KWG0708010	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613935	Prep Date:	07/02/2007		
Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072407.B\072007_F.M			Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)			Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D			Method ID:	MJ150
				Quant based on Report List	
Data File #1:	J:\GC09\DATA\072407.B\0724F012.D			Instrument:	GC09.i
Data File #2:	\\cash1\acq\data\GC09\data\072407_r.b\0724R012.D			Vial:	10
Acqu Date:	07/24/2007 16:31	Quant Date:	07/25/2007 12:19	Dilution:	1.0
Run Type:	SMPL			Soln Conc. Units:	ng/mL
Lab ID:	K0705409-006				
Signal #1:	DB-35MS	Signal #2:	DB-XLB		

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2	Rpt	
Decachlorobiphenyl	18.57	20.18 ^{-0.01}	442853	351276	68.57	71.30	71OK	✓
%Recovery =					69OK	71OK	Limits =	33-141

Target Compounds

Final Conc. Units: ug/Kg Dry Weight								Rpt	
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	0.0000	0.0000	2.9U	2.9U	2.9U
Aroclor 1016 {1}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1016 {2}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1016 {3}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1016 {4}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1016 {5}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1221			0	0	0.0000	0.0000	2.9U	2.9U	2.9U
Aroclor 1221 {1}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1221 {2}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1221 {3}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1221 {4}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1232			0	0	0.0000	0.0000	2.9U	2.9U	2.9U
Aroclor 1232 {1}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1232 {2}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1232 {3}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1232 {4}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1242			0	0	0.0000	0.0000	2.9U	2.9U	2.9U
Aroclor 1242 {1}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1242 {2}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1242 {3}			0d	0d	0.0000	0.0000	2.9U	2.9U	

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
C: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072407.B\0724F012.D	Instrument:	GC09.i
Data File #2:	\\cash1\acqdata\GC09\data\072407_r.b\0724R012.D	Vial:	10
Acqu Date:	07/24/2007 16:31	Quant Date:	07/25/2007 12:19
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-006	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1242 {5}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1248			0	0	0.0000	0.0000	2.9U	2.9U	2.9U
Aroclor 1248 {1}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1248 {2}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1248 {3}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1248 {4}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1248 {5}			0d	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1254			0	0	36.91	84.22	12Ui	26Ui	12Ui ✓
Aroclor 1254 {1}	9.17	9.85	5129m	5340	16.58	22.17	2.9Ui	2.9Ui	
Aroclor 1254 {2}	9.91	10.40	5931m	22495	29.14	181.42	2.9Ui	2.9Ui	
Aroclor 1254 {3}	10.12	10.64	10276m	10493	20.60	41.45	2.9Ui	2.9Ui	
Aroclor 1254 {4}	10.57	10.99 c	31473m	15687	81.34	136.00	2.9Ui	2.9Ui	
Aroclor 1254 {5}	10.76	c 11.25	0m	8177	0.0000	40.05	2.9Ui	2.9Ui	
Aroclor 1260			0	0	40.10	45.45	13Ui	14Ui	13Ui ✓
Aroclor 1260 {1}	10.44 +0.02	10.99 c	35071m	15687	90.18	66.59	2.9Ui	2.9Ui	
Aroclor 1260 {2}	10.76 +0.01 c	11.52 -0.01	0m	19772	0.0000	74.52	2.9Ui	2.9Ui	
Aroclor 1260 {3}	11.55 -0.01 c	12.16 -0.06	0m	0	0.0000	0.0000	2.9Ui	2.9Ui	
Aroclor 1260 {4}	12.34 -0.01 c	12.42 -0.01	5918m	5215	20.99	29.38	2.9Ui	2.9Ui	
Aroclor 1260 {5}	12.89 -0.01 c	13.89 -0.01	5405m	4629	9.13	11.32	2.9Ui	2.9Ui	
Aroclor 1262			0	0	25.60	0.0000	7.7J	2.9U	2.9U ✓
Aroclor 1262 {1}	11.55 c		0	0d	0.0000	0.0000	2.9U	2.9U	
Aroclor 1262 {2}	12.34 c		5918	0d	17.63	0.0000	5.3J	2.9U	
Aroclor 1262 {3}	12.89 c		5405	0d	8.09	0.0000	2.9U	2.9U	
Aroclor 1262 {4}	13.84		5534	0d	19.00	0.0000	5.7J	2.9U	
Aroclor 1262 {5}	14.05 c		30109	0d	57.71	0.0000	17	2.9U	
Aroclor 1268			0	0	15.95	0.0000	4.8J	2.9U	2.9U ✓
Aroclor 1268 {1}	14.05 c		30109	0d	36.79	0.0000	11J	2.9U	
Aroclor 1268 {2}	14.86		695	0d	1.06	0.0000	2.9U	2.9U	
Aroclor 1268 {3}	15.23		3948	0d	23.79	0.0000	7.2J	2.9U	
Aroclor 1268 {4}	15.86		4577	0d	16.02	0.0000	4.8J	2.9U	
Aroclor 1268 {5}	17.23		3969	0d	2.08	0.0000	2.9U	2.9U	

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount:	11.24 g	Dilution:	1.0
Prep Final Vol:	2 ml	Unit Factor:	1
Solids:	59.1 %		

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/20/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708132	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613936	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQUDATA\GC09\DATA\072607.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072607.B\0726F010.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R010.D	Vial:	6
Acqu Date:	07/26/2007 21:04	Quant Date:	07/31/2007 14:05
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-007	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2		Rpt
Decachlorobiphenyl	18.58 ^{+0.02}	20.19 ^{+0.01}	615414	349082	95.29	70.86		95OK
			%Recovery =		95OK	71OK	Limits = 33-141	

Target Compounds

				Final Conc. Units:		ug/Kg Dry Weight			
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1016 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1016 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1016 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1016 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1016 {5}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1221			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1221 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1221 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1221 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1221 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1232			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1232 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1232 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1232 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1232 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1242			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1242 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1242 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1242 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
?: Insufficient information to determine acceptance
NR: Analyte not reported from this analysis

?: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072607.B\0726F010.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R010.D	Vial:	6
Acqu Date:	07/26/2007 21:04	Quant Date:	07/31/2007 14:05
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-007	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1242 {5}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1248			0	0	988.79	1,241	150	190	190 ✓
Aroclor 1248 {1}	7.70	8.29	159896	171394m	1,014	1,364	150	210	
Aroclor 1248 {2}	8.14	8.59	225153	0m	1,026	0.0000	150	2.6U	
Aroclor 1248 {3}	8.45	9.45	108551	273419m	564.19	968.10	85	150	
Aroclor 1248 {4}	8.83	9.56	248094	266768m	882.55	1,390	130	210	
Aroclor 1248 {5}	8.92	9.85	517386	0m	1,458	0.0000	220	2.6U	
Aroclor 1254			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1254 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1254 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1254 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1254 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1254 {5}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1260			0	0	942.25	1,392	140	210	210 ✓
Aroclor 1260 {1}	10.43 ^{+0.00}	10.99	332936	317761m	856.10	1,349	130	200	
Aroclor 1260 {2}	10.75 ^{+0.00}	11.53	499089	429174m	1,124	1,618	170	240	
Aroclor 1260 {3}	11.56 ^{+0.00}	12.21	0	614429m	0.0000	1,860	2.6U	280	
Aroclor 1260 {4}	12.35 ^{+0.00}	12.43 ^{+0.00}	199205	179613m	706.37	1,012	110	150	
Aroclor 1260 {5}	12.89 ^{+0.00}	13.89 ^{+0.00}	641112	459406m	1,083	1,123	160	170	
Aroclor 1262			0	0	0.0000	0.0000	2.6U	2.6U	2.6U
Aroclor 1262 {1}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1262 {2}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1262 {3}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1262 {4}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1262 {5}			0d	0d	0.0000	0.0000	2.6U	2.6U	
Aroclor 1268			0	0	56.77	128.90	8.5J	19	19P
Aroclor 1268 {1}	14.06	15.15	0	150876	0.0000	250.81	2.6U	38	
Aroclor 1268 {2}	14.86	16.04	14949	9454	22.86	19.30	3.4J	2.9J	
Aroclor 1268 {3}	15.25	16.42	19491	0	117.46	0.0000	18	2.6U	
Aroclor 1268 {4}	15.88	17.25	0	0	0.0000	0.0000	2.6U	2.6U	
Aroclor 1268 {5}	17.24	18.82	57151	167590	30.00	116.59	4.5J	18	RPD

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount:	20.04 g	Dilution:	1.0
Prep Final Vol:	2 ml	Unit Factor:	1
Solids:	66.3 %		

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Quantitation Report

Bottle ID:		Tier:	I	Matrix:	SEDIMENT
Prod Code:	8082 PCB_LL	Collect Date:	06/19/2007	Receive Date:	06/22/2007

Analysis Lot:	KWG0708132	Prep Lot:	KWG0707164	Report Group:	K0705409
Analysis Method:	8082	Prep Method:	EPA 3540C		
Prep Ref:	613930	Prep Date:	07/02/2007		

Quant Method:	\\CASH1\ACQU\DATA\GC09\DATA\072607.B\072007_F.M	Calibration ID:	CAL6451
Title:	Polychlorinated Biphenyls (PCBs)	Report List ID:	LJ2797
MB Ref:	J:\GC09\DATA\072307.B\0723F024.D	Method ID:	MJ150
		Quant based on Report List	

Data File #1:	J:\GC09\DATA\072607.B\0726F011.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R011.D	Vial:	7
Acqu Date:	07/26/2007 21:30	Quant Date:	07/31/2007 13:50
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-008	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Surrogate Compounds

Parameter Name	RT #1	RT #2	Resp #1	Respe #2	ng/mL #1	ng/mL #2		Rpt
Decachlorobiphenyl	18.58 ^{+0.02}	20.19 ^{+0.00}	659118	367428m	102.06	74.58		102OK
			%Recovery =		102OK	75OK	Limits =	33-141

Target Compounds

				Final Conc. Units:		ug/Kg Dry Weight			
Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1016			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1016 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1016 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1016 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1016 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1016 {5}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1221			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1221 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1221 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1221 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1221 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1232			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1232 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1232 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1232 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1232 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1242			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1242 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1242 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1242 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

Data File #1:	J:\GC09\DATA\072607.B\0726F011.D	Instrument:	GC09.i
Data File #2:	\\Cash1\Acqudata\GC09\data\072607_r.b\0726R011.D	Vial:	7
Acqu Date:	07/26/2007 21:30	Quant Date:	07/31/2007 13:50
Run Type:	SMPL	Dilution:	1.0
Lab ID:	K0705409-008	Soln Conc. Units:	ng/mL
Signal #1:	DB-35MS	Signal #2:	DB-XLB

Target Compounds

Final Conc. Units: ug/Kg Dry Weight

Parameter Name	RT #1	RT #2	Resp #1	Resp #2	ng/mL #1	ng/mL #2	ug/Kg #1	ug/Kg #2	Rpt
Aroclor 1242 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1242 {5}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1248			0	0	302.02	414.78	190	260	190
Aroclor 1248 {1}	7.70	8.29	43270m	43753m	274.34	348.20	170	220	
Aroclor 1248 {2}	8.14	8.59	67629m	62723m	308.16	488.09	190	300	
Aroclor 1248 {3}	8.45	9.45	35684m	102853m	185.47	364.17	120	230	
Aroclor 1248 {4}	8.82	9.56	82881m	87998m	294.83	458.67	180	290	
Aroclor 1248 {5}	8.92	9.85	158776m	0m	447.28	0.0000	280	5.4U	
Aroclor 1254			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1254 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1254 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1254 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1254 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1254 {5}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1260			0	0	567.53	701.31	350	440	440
Aroclor 1260 {1}	10.43 ^{+0.00}	10.99	187209m	180671m	481.38	766.90	300	480	
Aroclor 1260 {2}	10.75 ^{+0.00}	11.53	297332m	228027m	669.33	859.46	420	540	
Aroclor 1260 {3}	11.56 ^{+0.00}	12.21 ^{+0.00}	0m	0m	0.0000	0.0000	5.4U	5.4U	
Aroclor 1260 {4}	12.35	12.43 ^{+0.00}	130688m	102892m	463.41	579.74	290	360	
Aroclor 1260 {5}	12.89 ^{+0.00}	13.89 ^{+0.00}	388343m	245062m	656.02	599.15	410	370	
Aroclor 1262			0	0	0.0000	0.0000	5.4U	5.4U	5.4U
Aroclor 1262 {1}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1262 {2}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1262 {3}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1262 {4}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1262 {5}			0d	0d	0.0000	0.0000	5.4U	5.4U	
Aroclor 1268			0	0	125.68	199.20	78	120	120P
Aroclor 1268 {1}	14.06	15.15	0m	143291	0.0000	238.20	5.4U	150	
Aroclor 1268 {2}	14.86	16.03	46889m	71893	71.70	146.75	45	92	
Aroclor 1268 {3}	15.24	16.40	33133m	0	199.67	0.0000	120	5.4U	
Aroclor 1268 {4}	15.88	17.25	0m	0	0.0000	0.0000	5.4U	5.4U	
Aroclor 1268 {5}	17.24	18.81	201365m	305662	105.69	212.64	66	130	

The +/- after Retention Time symbolize the direction of the RT shift

Prep Amount:	6.25 g	Dilution:	1.0
Prep Final Vol:	2 ml	Unit Factor:	1
Solids:	51.3 %		

Final Concentration = ((Soln Conc x Prep Final Vol x Dilution) / (Prep Amount x Solids)) x Unit Factor

U: Undetected at or above MDL
J: Analyte detected above MDL, but below MRL
B: Hit above MRL also found in Method Blank
E: Analyte concentration above high point of ICAL
N: Presumptive evidence of compound

D: Result from dilution
m: Manual integration performed
d: Compound manually deleted
NR: Analyte not reported from this analysis

*: Result fails acceptance criteria
#: Acceptance criteria not applicable
?: Insufficient information to determine acceptance
e: Result >= MRL, but MRL less than low point of ICAL
c: check for co-elution

2009 Sediment Traps



55 SW Yamhill Street, Suite 400 Portland, OR 97204
P: 503.239.8799 F: 503.239.8940
info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review Inline Solids Investigation City Outfall Basin 18

To: File
From: Karen Demsey, GSI Water Solutions, Inc.
Date: August 19, 2009

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated for chemical analysis of inline solids obtained during source control investigation activities conducted in winter 2009 by the City of Portland in Outfall Basin 18 (OF-18). Six stormwater sediment trap samples were collected in OF-18 and submitted for analysis. The results of the sampling and analysis are presented in the Technical Memorandum No. OF18-2.

The laboratory analyses of the OF 18 solids samples were conducted by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and subcontracted laboratories. The following laboratories conducted the analyses listed below:

- BES WPCL
 - Total Solids (EPA 160.3M)
 - Metals (EPA 6000 and 7000 Series)
 - Polychlorinated Biphenyls (PCBs) (EPA 8082)
- Test America (TA)
 - Total Organic Carbon (TOC) (ASTM D1429-82M)
 - Percent Dry Weight (solids) (ASTM D2216-80)
 - Chlorinated herbicides (EPA 8151A)
 - Polynuclear Aromatic Hydrocarbons (PAHs) (EPA 8270M-SIM)
 - Phthalates (EPA 8270-SIM)
- Columbia Analytical Services (CAS)
 - Total Organic Carbon (TOC) (ASTM D1429-82M)

- Organochlorine Pesticides (EPA 8081A)
- Analytical Resources, Inc. (ARI)
 - Grain Size (ASTM D421)

The WPCL summary reports and the subcontracted laboratory's data reports are attached for all analyses associated with these source control program samples. The WPCL summary report comments that, with some exceptions (included in the following sections below), all analytical QA/QC criteria were met for these samples including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

This QA/QC review of the analytical data, based upon the available documentation supplied by the laboratory, consisted of reviewing the following:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within accuracy control limits
- Matrix spike and matrix spike duplicate results within control limits
- Laboratory control sample recoveries within control limits

The results of the laboratory report QA/QC review are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The sample extraction holding time was exceeded for the herbicide analysis of samples FO095694, FO095695, and FO095697. The WPCL laboratory report notes that the results for the herbicides analysis of these samples may be low estimates due to compound degradation. The remaining samples were extracted and analyzed within the acceptable holding times for all analyses.

Method Blanks

Method blanks were analyzed for all chemical analyses. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the analysis of all organic compounds. Surrogate spike recoveries for phthalates in samples FO095693, FO095695, and FO095696 were not

reported. TA reports that these samples required dilution due to the nature of the sample matrix, which reduced the surrogate spike concentrations to a level where the recovery calculation does not provide useful information.

The lower control criteria were exceeded for both surrogates in the initial method blank for analysis of organochlorine pesticides. CAS reanalyzed the method blank, and the reanalysis met control criteria. Control criteria also were exceeded for one surrogate during the analysis of organochlorine pesticides in sample FO095696 due to matrix interference. CAS reports that because the secondary surrogate was within control limits, no further corrective action was appropriate.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) analyses were performed for organochlorine pesticides, chlorinated herbicides, PAHs, and phthalates. MS/MSD recoveries for one or more analytes were above acceptance limits during analysis of chlorinated herbicides and PAHs. Laboratory control samples for these analyses were within acceptance limits indicating the analytical batch was in control. MS/MSD recoveries for the remaining analyses were within acceptance limits.

Laboratory Control Sample

Laboratory control samples were processed during the analyses of organochlorine pesticides, chlorinated herbicides, PAHs, phthalates, and TOC. LCS recoveries all were within acceptance limits.

Other

Some organochlorine pesticide compounds are reported as estimated (“P”) because the results from the primary and verification gas chromatography columns varied by more than 40 percent RPD. CAS reports that the higher of the two values was reported when no evidence of matrix interference was observed, and the lower of the two values was reported when there was apparent matrix interference affecting the alternate column that produced the higher value. WPCL has flagged these results as estimates (EST) in their summary report.

Method reporting limits (MRLs) were elevated for PCB Aroclor analyses of samples FO095693, FO095695 and FO095696. WPCL reports that in the case of sample FO095693, the MRLs were raised due to the low level of solids in the sample; traces of Aroclors 1254 and 1260 were evident in this sample but at concentrations below the MRLs, and the results are reported as not detected at a concentration greater than the MRL. For samples FO095695 and FO095696, the MRL for Aroclor 1248 was raised due to non-target interfering compounds (possibly organochlorine pesticides).

The MRLs for several organochlorine pesticides were elevated for all field samples due to matrix interference (presence of non-target background components). CAS reports that sample FO095693 required dilution due to the presence of elevated levels of target analytes during organochlorine pesticides analysis, and the MRLs were adjusted to reflect the dilution.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

June 26, 2009

Mr. Howard Holmes
Test America, Inc.
9405 SW Nimbus Ave.
Beaverton, OR 97008

Subject: Project No.: PSF0519
ARI Project No.: PD28

Dear Mr. Holmes,

The following pages provide the information you requested. Please call me to discuss any questions or comments you may have on the data or its presentation.

Best Regards,
Analytical Resources Incorporated

Guenna Smith
Geotechnical Division Manager
206-695-6246
guennas@arilabs.com

Enclosures

cc: File PD28

SUBCONTRACT ORDER

TestAmerica Portland

PSF0519

SENDING LABORATORY:


TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Phone: (503) 906-9200
Fax: (503) 906-9210
Project Manager: Howard Holmes

RECEIVING LABORATORY:

Analytical Resources, Inc. (ARI)
4611 S 134th Place, Suite 100
Tukwilla, WA 98168
Phone : (206) 621-6490
Fax: 206-621-7523
Project Location: OR - OREGON
Receipt Temperature: °C Ice: Y / N

needs Excel EDD

Analysis	Units	Due	Expires	Comments
Sample ID: PSF0519-02				
Soil			Sampled: 06/09/09 15:00	
Grain Size (ASTM) - SUB	ug/l	06/30/09	12/06/09 15:00	sub to Analytical Resources Inc (ARI)
Containers Supplied: 8 oz. jar (A)				
Sample ID: PSF0519-03				
Soil			Sampled: 06/10/09 13:15	
Grain Size (ASTM) - SUB	ug/l	06/30/09	12/07/09 13:15	sub to Analytical Resources Inc (ARI)
Containers Supplied: 8 oz. jar (A)				
Sample ID: PSF0519-05				
Soil			Sampled: 06/09/09 00:00	
Grain Size (ASTM) - SUB	ug/l	06/30/09	12/06/09 00:00	sub to Analytical Resources Inc (ARI)
Containers Supplied: 8 oz. jar (A)				


Released By

6/17/09 1400
Date/Time


Received By

6/18/09 1010
Date/Time

Released By

Date/Time

Received By

Date/Time



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Test America, Inc.

ARI Project No.: PD28

Client Project: PSF0519

Case Narrative

1. Three samples were received on June 18, 2009, and were in good condition.
2. The samples were submitted for grain size distribution, according to ASTM D422. The samples were prepared according to ASTM D421.
3. An assumed specific gravity of 2.65 was used in the calculations.
4. A standard milkshake mixer type device was used to disperse the sample.
5. The data is provided in summary tables and plots.
6. There were no further anomalies in the samples or test method.

Approved by:
Title:

Guenna Sente
Geotechnical Laboratory Manager

Date:

6/26/09

Test America, Inc.
PSF0519

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (150)	#200 (75)	32	22	13	9	7	3.2	1.3
PSF0519-02	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	96.5	91.7	88.2	83.7	77.9	64.6	21.6	14.9	10.8	9.5	8.1	6.8	6.1
PSF0519-03	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	97.6	90.7	78.4	69.2	58.4	36.1	26.4	20.8	16.6	14.6	11.1	5.5
PSF0519-05	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.9	95.9	91.8	88.5	84.2	78.4	65.0	22.8	15.7	10.7	10.0	8.5	8.5	5.0

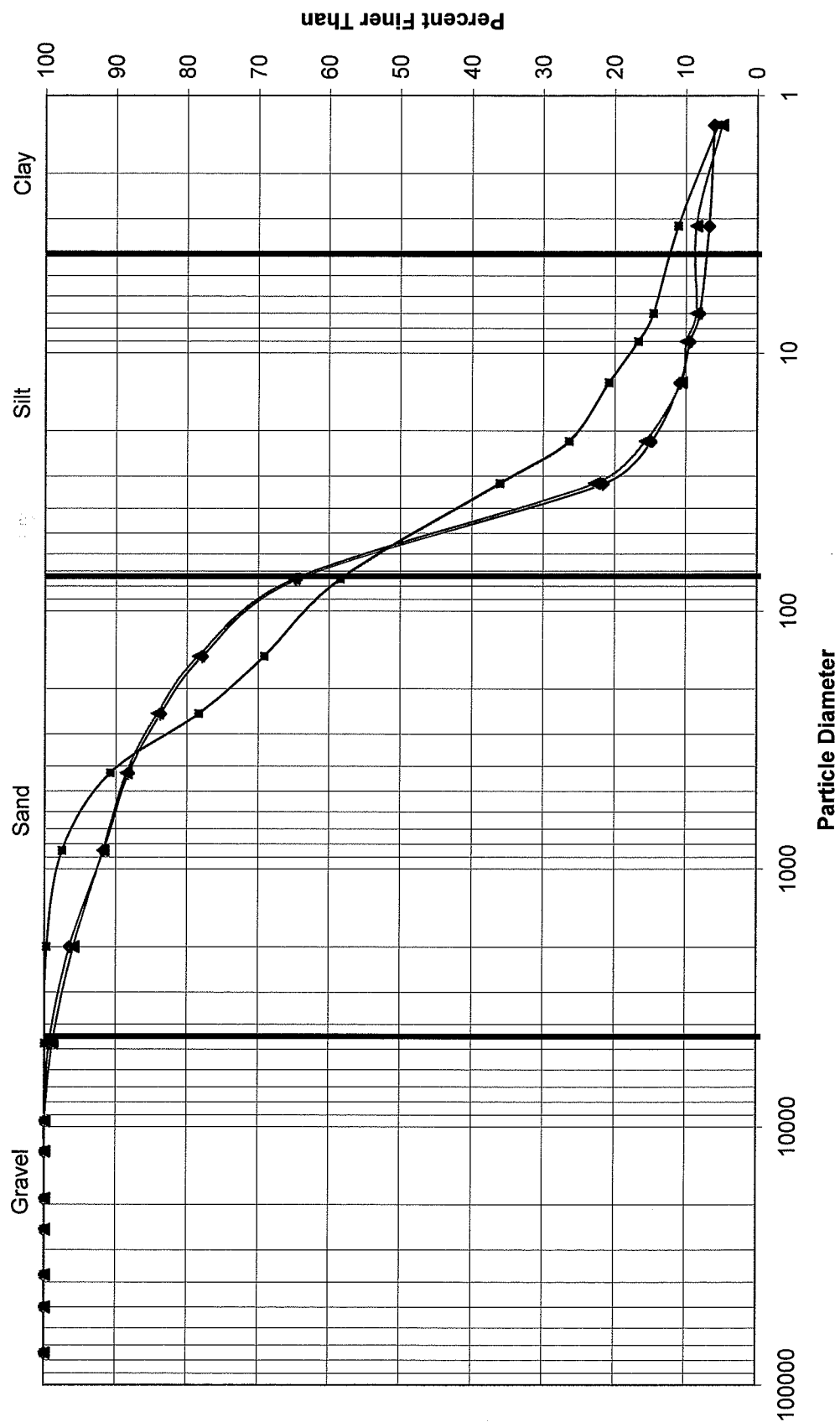
Testing performed according to ASTM D421/D422

Test America, Inc.
PSF0519

Percent Retained in Each Size Fraction

Description	%Coarse Gravel				% Gravel			% Coarse Sand	% Medium Sand		% Fine Sand				% Very Coarse Silt	% Coarse Silt	% Medium Silt	% Fine Silt	% Very Fine Silt	% Clay	
	3-2"	2-1 1/2"	1 1/2"-1"	1-3/4"	3/4-1/2"	1/2-3/8"	3/8"-4750		4750-2000	2000-850	850-425	425-250	250-150	150-75							
Particle Size (microns)																					
PSF0519-02	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.8	4.8	3.5	4.5	5.9	13.2	43.0	75-32	32-22	22-13	13-9	9-7	7-3.2	<3.2
PSF0519-03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2	6.8	12.4	9.2	10.7	22.3	22.3	9.7	5.5	4.2	2.1	3.5	11.1
PSF0519-05	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.0	4.1	3.3	4.3	5.8	13.5	42.2	42.2	7.1	5.0	0.7	1.4	0.0	8.5

Grain Size Distribution by Hydrometer



PSF0519-02
 PSF0519-03
 PSF0519-05

August 4, 2009

Analytical Report for Service Request No: K0905407

Jennifer Shackelford
Portland, City of
1120 SW Fifth Avenue # 1000
Portland, OR 97204

RE: Portland Harbor Stormwater Sample

Dear Jennifer:

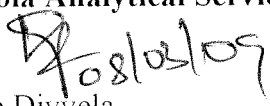
Enclosed are the results of the samples submitted to our laboratory on June 16, 2009. For your reference, these analyses have been assigned our service request number K0905407.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.


Pradeep Divvela
Project Chemist

PD/ln

Page 1 of 28

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
 - i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
 - i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge

Service Request No.: K0905407
Date Received: 06/16/09

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

Sample Receipt

Six soil samples were received for analysis at Columbia Analytical Services on 06/16/09. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA Method 8081A – LL

Surrogate Exceptions:

The lower control criterion was exceeded for Tetrachloro-m-xylene and Decachlorobiphenyl in method blank KWG0905290-10. Since the problem indicated a potential negative bias in the Method Blank, all associated field samples containing target analytes were re-extracted and re-analyzed past the recommended hold time. The Method Blank met control criteria for the reanalysis. The results for the field samples were comparable for both determinations, which indicated the problem with the initial analysis was restricted to the Method Blank. Therefore, the results from the original analysis were reported. Note that sample FO095693 was extracted three times and all three analyses were in agreement. Also, insufficient sample remained for re-extraction for sample FO095692. The data was flagged to indicate the problem.

The control criteria were exceeded for Tetrachloro-m-xylene in sample FO095696 due to matrix interference. The presence of non-target background components prevented adequate resolution of the surrogate. Accurate quantitation was not possible. However, the secondary surrogate Decachlorobiphenyl was within control limits. No further corrective action was appropriate.

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for at least one analyte was exceeded in some samples. The higher of the two values was reported when no evidence of a matrix interference was observed. The lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Approved by  Date 

Elevated Detection Limits:

The detection limit was elevated for several analytes in all field samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample FO095693 required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

No other anomalies associated with the analysis of these samples were observed.

Approved by  Date 08/04/09

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Portland, City of
Project Name : Portland Harbor Stormwater Sample
Project Number : NA
Sample Matrix : SLUDGE, SOLID

Service Request : K0905407
Date Collected : 06/11/09
Date Received : 06/16/09

Carbon, Total Organic (TOC)

Prep Method : SOP
Analysis Method : ASTM D4129-82M
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
FO095692	K0905407-001	0.05	0.02	1	6/18/2009	06/22/09	16.9	
Method Blank	K0905407-MB	0.05	0.02	1	NA	06/22/09	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Portland, City of
Project Name : Portland Harbor Stormwater Sample
Project Number : NA
Sample Matrix : SLUDGE, SOLID

Service Request : K0905407
Date Collected : 6/11/2009
Date Received : 6/16/2009
Date Prepared : 06/18/09
Date Analyzed : 06/22/09

Duplicate Summary Inorganic Parameters

Sample Name : FO095692
Lab Code : K0905407-001DUP
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
Carbon, Total Organic (TOC)	SOP	ASTM D4129-82M	0.05	16.9	17.0	17.0	<1	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Portland, City of
Project Name : Portland Harbor Stormwater Sample
Project Number : NA
Sample Matrix : SLUDGE, SOLID

Service Request : K0905407
Date Collected : 6/11/2009
Date Received : 6/16/2009
Date Prepared : 06/18/09
Date Analyzed : 06/22/09

Matrix Spike Summary Inorganic Parameters

Sample Name : FO095692
Lab Code : K0905407-001MS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS	Result Notes
								Percent Recovery Acceptance Limits	
Carbon, Total Organic (TOC)	SOP	ASTM D4129-82M	0.05	25.2	16.9	41.6	98	75-114	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Portland, City of
Project Name : Portland Harbor Stormwater Sample
Project Number : NA
Sample Matrix : SEDIMENT

Service Request : K0905407
Date Collected : NA
Date Received : NA
Date Prepared : NA
Date Analyzed : 06/22/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name : Lab Control Sample
Lab Code : K0905407-LCS
Test Notes :

Units : Percent
Basis : Dry

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery	Result Notes
						Acceptance Limits	
Carbon, Total Organic (TOC)	SOP	ASTM D4129-82M	0.42	0.46	110	74-123	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Portland, City of
Project : Portland Harbor Stormwater Sample

Service Request : K0905407
Date Collected : NA
Date Received : NA

Carbon, Total Organic (TOC)
ASTM D4129-82M
Units: Percent

CONTINUING CALIBRATION VERIFICATION (CCV)

	Date Analyzed	True Value	Measured Value	Percent Recovery
CCV1 Result	6/22/2009	20.0	19.6	98
CCV2 Result	6/22/2009	20.0	20.1	101
CCV3 Result	6/22/2009	20.0	19.7	99
CCV4 Result	6/22/2009	20.0	19.5	98

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Portland, City of
Project : Portland Harbor Stormwater Sample

Service Request : K0905407
Date Collected : NA
Date Received : NA

Carbon, Total Organic (TOC)
ASTM D4129-82M
Units: Percent

CONTINUING CALIBRATION BLANK (CCB)

	Date Analyzed	MRL	Blank Value
CCB1 Result	6/22/2009	0.05	ND
CCB2 Result	6/22/2009	0.05	0.03 J
CCB3 Result	6/22/2009	0.05	0.03 J
CCB4 Result	6/22/2009	0.05	0.02 J

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/11/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095692
Lab Code: K0905407-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	5.7	0.63	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	U	5.7	1.1	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	12	P	5.7	0.46	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	5.7	5.7	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	9.4	P	5.7	0.69	1	06/18/09	06/26/09	KWG0905290	
Aldrin	ND	Ui	5.7	5.7	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	ND	U	5.7	0.48	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	20		5.7	0.52	1	06/18/09	06/26/09	KWG0905290	
Endosulfan I	ND	Ui	9.3	9.3	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	ND	Ui	11	11	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	ND	Ui	5.7	5.6	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	3.4	JP	5.7	0.63	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	5.7	0.81	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	Ui	5.7	5.7	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	ND	Ui	5.9	5.9	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	5.7	5.7	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	ND	Ui	5.7	5.7	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	ND	Ui	19	19	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	ND	Ui	5.7	3.6	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	14		5.7	1.1	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	370	370	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	85	25-125	06/26/09	Acceptable
Decachlorobiphenyl	93	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/09/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095693
Lab Code: K0905407-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	2.2	2.2	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	Ui	2.2	2.2	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	ND	Ui	7.9	7.9	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	4.8	4.8	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	300	D	11	1.4	5	06/18/09	06/26/09	KWG0905290	
Aldrin	78		2.2	0.35	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	ND	Ui	6.3	6.3	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	350	D	11	0.99	5	06/18/09	06/26/09	KWG0905290	
Endosulfan I	ND	Ui	5.2	5.2	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	52		2.2	0.22	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	3.8	P	2.2	0.31	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	66		2.2	0.24	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	3.2	3.2	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	Ui	18	18	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	55		2.2	0.24	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	3.6	3.6	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	2.4		2.2	0.24	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	ND	Ui	23	23	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	8.8	P	2.2	0.21	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	ND	Ui	3.7	3.7	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	790	790	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	115	25-125	06/26/09	Acceptable
Decachlorobiphenyl	118	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/09/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095694
Lab Code: K0905407-003
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	0.11	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	Ui	1.0	1.0	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	ND	U	1.0	0.080	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	1.0	0.20	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	ND	U	1.0	0.12	1	06/18/09	06/26/09	KWG0905290	
Aldrin	0.66	J	1.0	0.16	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	ND	Ui	1.0	0.11	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	ND	U	1.0	0.090	1	06/18/09	06/26/09	KWG0905290	
Endosulfan I	0.083	JP	1.0	0.063	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	0.24	J	1.0	0.10	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	ND	U	1.0	0.14	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	1.5		1.0	0.11	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	1.0	0.29	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	U	1.0	0.14	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	ND	Ui	1.0	1.0	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	1.0	0.27	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	ND	Ui	1.0	1.0	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	ND	Ui	1.1	1.1	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	ND	U	1.0	0.093	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	3.7		1.0	0.19	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	50	43	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	92	25-125	06/26/09	Acceptable
Decachlorobiphenyl	88	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/10/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095695
Lab Code: K0905407-004
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	0.52	JP	1.9	0.21	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	U	1.9	0.34	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	12	P	1.9	0.16	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	2.9	2.9	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	26		1.9	0.23	1	06/18/09	06/26/09	KWG0905290	
Aldrin	24		1.9	0.31	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	ND	Ui	1.9	0.26	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	29		1.9	0.17	1	06/18/09	06/26/09	KWG0905290	
Endosulfan I	9.1		1.9	0.12	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	21		1.9	0.19	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	24		1.9	0.27	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	61		1.9	0.21	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	1.9	0.44	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	Ui	5.6	5.6	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	72		1.9	0.21	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	1.9	1.9	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	2.4	P	1.9	0.21	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	ND	Ui	33	33	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	12	P	1.9	0.18	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	ND	Ui	1.9	1.9	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	470	470	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	86	25-125	06/26/09	Acceptable
Decachlorobiphenyl	86	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/10/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095696
Lab Code: K0905407-005
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	8.9	8.9	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	Ui	23	23	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	ND	Ui	12	12	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	3.7	3.7	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	12	P	3.7	0.44	1	06/18/09	06/26/09	KWG0905290	
Aldrin	ND	Ui	29	29	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	ND	Ui	8.6	8.6	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	ND	Ui	25	25	1	06/18/09	06/26/09	KWG0905290	
Endosulfan I	8.4		3.7	0.23	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	ND	Ui	23	23	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	ND	Ui	13	13	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	68		3.7	0.40	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	3.7	3.7	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	Ui	20	20	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	45		3.7	0.40	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	3.7	3.7	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	4.0	P	3.7	0.40	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	95	P	3.7	0.62	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	ND	Ui	3.7	3.7	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	ND	Ui	4.0	4.0	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	970	970	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	150	25-125	06/26/09	Outside Control Limits
Decachlorobiphenyl	89	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407
Date Collected: 06/09/2009
Date Received: 06/16/2009

Organochlorine Pesticides

Sample Name: FO095697
Lab Code: K0905407-006
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	1.2	0.25	1	06/18/09	06/26/09	KWG0905290	
beta-BHC	ND	U	1.2	0.21	1	06/18/09	06/26/09	KWG0905290	
gamma-BHC (Lindane)	ND	Ui	1.2	0.76	1	06/18/09	06/26/09	KWG0905290	
delta-BHC	ND	Ui	1.2	1.2	1	06/18/09	06/26/09	KWG0905290	
Heptachlor	ND	Ui	1.2	0.33	1	06/18/09	06/26/09	KWG0905290	
Aldrin	0.94	J	1.2	0.19	1	06/18/09	06/26/09	KWG0905290	
Heptachlor Epoxide	0.13	JP	1.2	0.098	1	06/18/09	06/26/09	KWG0905290	
gamma-Chlordane†	0.34	JP	1.2	0.11	1	06/18/09	06/26/09	KWG0905290	
Endosulfan I	0.21	JP	1.2	0.074	1	06/18/09	06/26/09	KWG0905290	
alpha-Chlordane	0.55	JP	1.2	0.12	1	06/18/09	06/26/09	KWG0905290	
Dieldrin	ND	U	1.2	0.17	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDE	1.3		1.2	0.13	1	06/18/09	06/26/09	KWG0905290	
Endrin	ND	Ui	1.2	0.12	1	06/18/09	06/26/09	KWG0905290	
Endosulfan II	ND	Ui	1.2	1.2	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDD	ND	Ui	1.2	0.80	1	06/18/09	06/26/09	KWG0905290	
Endrin Aldehyde	ND	Ui	1.2	0.27	1	06/18/09	06/26/09	KWG0905290	
Endosulfan Sulfate	ND	Ui	1.2	1.2	1	06/18/09	06/26/09	KWG0905290	
4,4'-DDT	ND	Ui	1.2	1.2	1	06/18/09	06/26/09	KWG0905290	
Endrin Ketone	ND	Ui	1.2	0.40	1	06/18/09	06/26/09	KWG0905290	
Methoxychlor	ND	U	1.2	0.23	1	06/18/09	06/26/09	KWG0905290	
Toxaphene	ND	Ui	58	28	1	06/18/09	06/26/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	86	25-125	06/26/09	Acceptable
Decachlorobiphenyl	77	22-142	06/26/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sediment

Service Request: K0905407
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG0905290-10
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/18/09	06/25/09	KWG0905290	
beta-BHC	ND	U	0.50	0.18	1	06/18/09	06/25/09	KWG0905290	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/18/09	06/25/09	KWG0905290	
delta-BHC	ND	U	0.50	0.074	1	06/18/09	06/25/09	KWG0905290	
Heptachlor	ND	U	0.50	0.12	1	06/18/09	06/25/09	KWG0905290	
Aldrin	ND	U	0.50	0.16	1	06/18/09	06/25/09	KWG0905290	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/18/09	06/25/09	KWG0905290	
Endosulfan I	ND	U	0.50	0.063	1	06/18/09	06/25/09	KWG0905290	
Dieldrin	0.24	J	0.50	0.14	1	06/18/09	06/25/09	KWG0905290	
4,4'-DDE	ND	U	0.50	0.11	1	06/18/09	06/25/09	KWG0905290	
Endrin	ND	U	0.50	0.094	1	06/18/09	06/25/09	KWG0905290	
Endosulfan II	ND	U	0.50	0.14	1	06/18/09	06/25/09	KWG0905290	
4,4'-DDD	ND	U	0.50	0.11	1	06/18/09	06/25/09	KWG0905290	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/18/09	06/25/09	KWG0905290	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/18/09	06/25/09	KWG0905290	
4,4'-DDT	ND	U	0.50	0.17	1	06/18/09	06/25/09	KWG0905290	
Toxaphene	ND	U	25	4.8	1	06/18/09	06/25/09	KWG0905290	
Chlordane	ND	U	5.0	1.9	1	06/18/09	06/25/09	KWG0905290	
2,4'-DDE	ND	U	0.50	0.16	1	06/18/09	06/25/09	KWG0905290	
2,4'-DDD	ND	U	0.50	0.13	1	06/18/09	06/25/09	KWG0905290	
2,4'-DDT	ND	U	0.50	0.058	1	06/18/09	06/25/09	KWG0905290	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	16	25-125	06/25/09	Outside Control Limits
Decachlorobiphenyl	18	22-142	06/25/09	Outside Control Limits

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Soil

Service Request: K0905407
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG0905589-4
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/26/09	07/09/09	KWG0905589	
beta-BHC	ND	U	0.50	0.18	1	06/26/09	07/09/09	KWG0905589	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/26/09	07/09/09	KWG0905589	
delta-BHC	ND	U	0.50	0.074	1	06/26/09	07/09/09	KWG0905589	
Heptachlor	ND	U	0.50	0.12	1	06/26/09	07/09/09	KWG0905589	
Aldrin	ND	U	0.50	0.16	1	06/26/09	07/09/09	KWG0905589	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/26/09	07/09/09	KWG0905589	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/26/09	07/09/09	KWG0905589	
Endosulfan I	ND	U	0.50	0.063	1	06/26/09	07/09/09	KWG0905589	
alpha-Chlordane	ND	U	0.50	0.10	1	06/26/09	07/09/09	KWG0905589	
Dieldrin	ND	U	0.50	0.14	1	06/26/09	07/09/09	KWG0905589	
4,4'-DDE	ND	Ui	0.50	0.50	1	06/26/09	07/09/09	KWG0905589	
Endrin	ND	U	0.50	0.094	1	06/26/09	07/09/09	KWG0905589	
Endosulfan II	ND	U	0.50	0.14	1	06/26/09	07/09/09	KWG0905589	
4,4'-DDD	ND	U	0.50	0.11	1	06/26/09	07/09/09	KWG0905589	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/26/09	07/09/09	KWG0905589	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/26/09	07/09/09	KWG0905589	
4,4'-DDT	ND	U	0.50	0.17	1	06/26/09	07/09/09	KWG0905589	
Endrin Ketone	ND	U	0.50	0.093	1	06/26/09	07/09/09	KWG0905589	
Methoxychlor	ND	U	0.50	0.19	1	06/26/09	07/09/09	KWG0905589	
Toxaphene	ND	U	25	4.8	1	06/26/09	07/09/09	KWG0905589	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	76	25-125	07/09/09	Acceptable
Decachlorobiphenyl	72	22-142	07/09/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sludge, solid

Service Request: K0905407

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
FO095692	K0905407-001	85	93
FO095693	K0905407-002	115	118
FO095694	K0905407-003	92	88
FO095695	K0905407-004	86	86
FO095696	K0905407-005	150 *	89
FO095697	K0905407-006	86	77
Method Blank	KWG0905290-10	16 *	18 *
Method Blank	KWG0905589-4	76	72
Batch QC	K0905405-001	79	87
Batch QCMS	KWG0905290-1	74	81
Batch QCDMS	KWG0905290-2	69	75
Batch QCMS	KWG0905290-7	61	66
Batch QCDMS	KWG0905290-8	63	77
Lab Control Sample	KWG0905290-3	80	82
Lab Control Sample	KWG0905589-3	76	71

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	25-125
Sur2 = Decachlorobiphenyl	22-142

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sediment

Service Request: K0905407
Date Extracted: 06/18/2009
Date Analyzed: 06/25/2009

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K0905405-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905290

Analyte Name	Sample Result	Batch QCMS KWG0905290-1 Matrix Spike			Batch QCDMS KWG0905290-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	ND	19.9	19.7	101	19.3	19.7	98	36-145	3	40
beta-BHC	ND	19.5	19.7	99	18.6	19.7	95	38-148	4	40
gamma-BHC (Lindane)	ND	20.4	19.7	104	19.3	19.7	98	33-154	6	40
delta-BHC	ND	22.1	19.7	112	20.7	19.7	105	40-164	7	40
Heptachlor	ND	19.8	19.7	101	18.6	19.7	94	38-145	6	40
Aldrin	ND	18.2	19.7	92	17.4	19.7	88	37-143	5	40
Heptachlor Epoxide	ND	18.3	19.7	93	17.1	19.7	87	29-150	7	40
gamma-Chlordane	ND	20.2	19.7	103	18.9	19.7	96	27-149	7	40
Endosulfan I	ND	17.4	19.7	89	16.7	19.7	85	18-133	4	40
alpha-Chlordane	ND	20.6	19.7	105	19.6	19.7	99	33-141	5	40
Dieldrin	ND	20.7	19.7	105	19.5	19.7	99	37-146	6	40
4,4'-DDE	ND	20.8	19.7	106	19.3	19.7	98	32-156	7	40
Endrin	ND	23.0	19.7	117	21.7	19.7	110	34-161	6	40
Endosulfan II	ND	19.5	19.7	99	18.7	19.7	95	19-147	4	40
4,4'-DDD	ND	21.2	19.7	108	19.9	19.7	101	26-161	6	40
Endrin Aldehyde	ND	14.7	19.7	75	13.3	19.7	67	11-147	10	40
Endosulfan Sulfate	ND	21.2	19.7	108	19.8	19.7	101	28-149	7	40
4,4'-DDT	ND	23.1	19.7	118	21.6	19.7	110	22-174	7	40
Endrin Ketone	ND	20.5	19.7	104	19.3	19.7	98	36-149	6	40
Methoxychlor	ND	24.4	19.7	124	23.2	19.7	118	37-162	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sediment

Service Request: K0905407
Date Extracted: 06/18/2009
Date Analyzed: 06/25/2009 -
06/26/2009

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K0905405-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905290

Analyte Name	Sample Result	Batch QCMS KWG0905290-7 Matrix Spike			Batch QCDMS KWG0905290-8 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	172	199	86	197	196	101	10-184	14	40

Results flagged with an asterisk (*) indicate values outside control criteria.

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Sediment

Service Request: K0905407
Date Extracted: 06/18/2009
Date Analyzed: 06/25/2009

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905290

Lab Control Sample
 KWG0905290-3
 Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
alpha-BHC	22.7	20.0	113	45-150
beta-BHC	23.9	20.0	119	47-149
gamma-BHC (Lindane)	22.7	20.0	113	48-146
delta-BHC	24.3	20.0	122	59-162
Heptachlor	22.0	20.0	110	47-142
Aldrin	20.4	20.0	102	43-141
Heptachlor Epoxide	20.1	20.0	101	48-140
Endosulfan I	19.1	20.0	95	36-124
Dieldrin	22.4	20.0	112	50-142
4,4'-DDE	22.7	20.0	113	51-149
Endrin	24.6	20.0	123	54-155
Endosulfan II	20.8	20.0	104	42-130
4,4'-DDD	23.2	20.0	116	51-152
Endrin Aldehyde	19.8	20.0	99	31-139
Endosulfan Sulfate	22.1	20.0	110	48-143
4,4'-DDT	24.9	20.0	125	59-151
Toxaphene	316	248	127	37-155
Chlordane	249	248	101	61-142
2,4'-DDE	29.4	24.8	119	36-145
2,4'-DDD	28.7	24.8	116	36-148
2,4'-DDT	28.8	24.8	116	34-148

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwater Sample
Sample Matrix: Soil

Service Request: K0905407
Date Extracted: 06/26/2009
Date Analyzed: 07/08/2009

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905589

Lab Control Sample KWG0905589-3 Lab Control Spike				
Analyte Name	Result	Expected	%Rec	%Rec Limits
alpha-BHC	22.7	20.0	114	45-150
beta-BHC	22.4	20.0	112	47-149
gamma-BHC (Lindane)	22.4	20.0	112	48-146
delta-BHC	23.8	20.0	119	59-162
Heptachlor	21.9	20.0	109	47-142
Aldrin	20.8	20.0	104	43-141
Heptachlor Epoxide	19.0	20.0	95	48-140
gamma-Chlordane	21.0	20.0	105	42-145
Endosulfan I	20.0	20.0	100	36-124
alpha-Chlordane	19.1	20.0	95	42-145
Dieldrin	20.9	20.0	105	50-142
4,4'-DDE	20.4	20.0	102	51-149
Endrin	23.5	20.0	118	54-155
Endosulfan II	18.7	20.0	94	42-130
4,4'-DDD	21.7	20.0	109	51-152
Endrin Aldehyde	16.7	20.0	84	31-139
Endosulfan Sulfate	18.8	20.0	94	48-143
4,4'-DDT	23.4	20.0	117	59-151
Endrin Ketone	19.8	20.0	99	41-158
Methoxychlor	24.2	20.0	121	55-153

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC _____

Client / Project: C. of PHd Service Request K09
 Received: 7/15/09 Opened: 7/15/09 By: af

1. Samples were received via? US Mail Fed Ex UPS DHL GH GS PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: _____ NA Y N
5. Temperature of cooler(s) upon receipt (°C): _____
 Temperature Blank (°C): _____
 Thermometer ID: _____
6. If applicable, list Chain of Custody Numbers: _____
7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? Indicate in the table below. NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles tested* received at the appropriate pH? Indicate in the table below. NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection? NA Y N
16. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

Additional Notes, Discrepancies, & Resolutions: _____

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PCP AS

Client / Project: City of Portland Service Request K09 5407

Received: 6-16-09 Opened: 6-16-09 By: bu

1. Samples were received via? ☐ US Mail ☐ Fed Ex ☐ UPS ☐ DHL ☐ GH ☐ GS ☐ PDX ☒ Courier ☐ Hand Delivered
2. Samples were received in: (circle) ☒ Cooler ☐ Box ☐ Envelope ☐ Other ☐ NA
3. Were custody seals on coolers? ☐ NA ☒ Y ☐ N If yes, how many and where? 1 Front
If present, were custody seals intact? ☒ Y ☐ N If present, were they signed and dated? ☒ Y ☐ N
4. Is shipper's air-bill filed? If not, record air-bill number: ☒ NA ☐ Y ☐ N
5. Temperature of cooler(s) upon receipt (°C): 4.6
Temperature Blank (°C): 3.2
Thermometer ID: SM0259
6. If applicable, list Chain of Custody Numbers: _____
7. Packing material used. ☐ Inserts ☐ Baggies ☐ Bubble Wrap ☒ Gel Packs ☐ Wet Ice ☐ Sleeves ☐ Other _____
8. Were custody papers properly filled out (ink, signed, etc.)? ☐ NA ☒ Y ☐ N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. ☐ NA ☒ Y ☐ N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? ☐ NA ☒ Y ☐ N
11. Did all sample labels and tags agree with custody papers? Indicate in the table below. ☐ NA ☒ Y ☐ N
12. Were appropriate bottles/containers and volumes received for the tests indicated? ☐ NA ☒ Y ☐ N
13. Were the pH-preserved bottles tested* received at the appropriate pH? Indicate in the table below. ☒ NA ☐ Y ☐ N
14. Were VOA vials received without headspace? Indicate in the table below. ☒ NA ☐ Y ☐ N
15. Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection? ☒ NA ☐ Y ☐ N
16. Was C12/Res negative? ☒ NA ☐ Y ☐ N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

Additional Notes, Discrepancies, & Resolutions: _____

July 17, 2009

Jennifer Shackelford
City of Portland Water Pollution Laboratory
6543 N. Burlington Ave.
Portland, OR 97203

RE: Portland Harbor

Enclosed are the results of analyses for samples received by the laboratory on 06/16/09 14:30.
The following list is a summary of the Work Orders contained in this report, generated on 07/17/09 12:07.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
PSF0519	Portland Harbor	36238

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/17/09 12:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO 095693	PSF0519-01	Soil	06/09/09 13:59	06/16/09 14:30
FO 095694	PSF0519-02	Soil	06/09/09 15:00	06/16/09 14:30
FO 095695	PSF0519-03	Soil	06/10/09 13:15	06/16/09 14:30
FO 095696	PSF0519-04	Soil	06/10/09 15:55	06/16/09 14:30
FO 095697	PSF0519-05	Soil	06/09/09 00:00	06/16/09 14:30

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/17/09 12:07

Analytical Case Narrative

TestAmerica - Portland, OR

PSF0519

8151 Herbicides

The herbicide samples in batch 9060755 had to be re-extracted in batch 9070017 due to contamination in the Method Blank. Samples were re-extracted past hold. Sample results were flagged and reported.

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Chlorinated Herbicides per EPA Method 8151A Modified
TestAmerica Portland

Analyte	Method	Result	MDL *	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-02RE1 (FO 095694)			Soil			Sampled: 06/09/09 15:00			H4, RL1, N1	
2,4-D	8151mod	ND	----	142	ug/kg dry	4x	9070017	07/01/09 10:51	07/08/09 19:23	
2,4-DB	"	ND	----	142	"	"	"	"	"	
2,4,5-T	"	ND	----	142	"	"	"	"	"	
2,4,5-TP (Silvex)	"	ND	----	142	"	"	"	"	"	
Dalapon	"	ND	----	142	"	"	"	"	"	
Dicamba	"	ND	----	142	"	"	"	"	"	
Dichlorprop	"	ND	----	142	"	"	"	"	"	
Dinoseb	"	ND	----	142	"	"	"	"	"	
MCPA	"	ND	----	14200	"	"	"	"	"	
MCP	"	ND	----	14200	"	"	"	"	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid 114% 30 - 140 % "										

PSF0519-03RE1 (FO 095695)			Soil			Sampled: 06/10/09 13:15			H4, RL1, N1	
2,4-D	8151mod	ND	----	607	ug/kg dry	20x	9070017	07/01/09 10:51	07/08/09 20:02	
2,4-DB	"	ND	----	607	"	"	"	"	"	
2,4,5-T	"	ND	----	607	"	"	"	"	"	
2,4,5-TP (Silvex)	"	ND	----	607	"	"	"	"	"	
Dalapon	"	ND	----	607	"	"	"	"	"	
Dicamba	"	ND	----	607	"	"	"	"	"	
Dichlorprop	"	ND	----	607	"	"	"	"	"	
Dinoseb	"	ND	----	607	"	"	"	"	"	
MCPA	"	ND	----	60700	"	"	"	"	"	
MCP	"	ND	----	60700	"	"	"	"	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid 121% 30 - 140 % "										

PSF0519-05RE1 (FO 095697)			Soil			Sampled: 06/09/09 00:00			H4, RL1, N1	
2,4-D	8151mod	ND	----	142	ug/kg dry	4x	9070017	07/01/09 10:51	07/08/09 20:41	
2,4-DB	"	ND	----	142	"	"	"	"	"	
2,4,5-T	"	ND	----	142	"	"	"	"	"	
2,4,5-TP (Silvex)	"	ND	----	142	"	"	"	"	"	
Dalapon	"	ND	----	142	"	"	"	"	"	
Dicamba	"	ND	----	142	"	"	"	"	"	
Dichlorprop	"	ND	----	142	"	"	"	"	"	
Dinoseb	"	ND	----	142	"	"	"	"	"	
MCPA	"	ND	----	14200	"	"	"	"	"	

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/17/09 12:07

Chlorinated Herbicides per EPA Method 8151A Modified
TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-05RE1 (FO 095697)			Soil			Sampled: 06/09/09 00:00			H4, RL1, N1	
MCP	8151mod	ND	-----	14200	ug/kg dry	4x	9070017	07/01/09 10:51	07/08/09 20:41	
Surrogate(s): 2,4-Dichlorophenylacetic acid				107%		30 - 140 %	"			"

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Polynuclear Aromatic Compounds per EPA 8270M-SIM
TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-01 (FO 095693)				Soil			Sampled: 06/09/09 13:59			RL3
Acenaphthene	EPA 8270m	ND	----	146	ug/kg dry	5x	9060620	06/17/09 15:10	06/23/09 14:45	
Acenaphthylene	"	ND	----	146	"	"	"	"	"	
Anthracene	"	247	----	146	"	"	"	"	"	
Benzo (a) anthracene	"	163	----	146	"	"	"	"	"	
Benzo (a) pyrene	"	186	----	146	"	"	"	"	"	
Benzo (b) fluoranthene	"	235	----	146	"	"	"	"	"	
Benzo (ghi) perylene	"	267	----	146	"	"	"	"	"	
Benzo (k) fluoranthene	"	164	----	146	"	"	"	"	"	
Chrysene	"	426	----	146	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	----	146	"	"	"	"	"	
Fluoranthene	"	491	----	146	"	"	"	"	"	
Fluorene	"	ND	----	146	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	150	----	146	"	"	"	"	"	
Naphthalene	"	ND	----	146	"	"	"	"	"	
Phenanthrene	"	463	----	146	"	"	"	"	"	
Pyrene	"	586	----	146	"	"	"	"	"	
<i>Surrogate(s): Fluorene-d10</i>				78.6%		24 - 125 %	"			"
<i>Pyrene-d10</i>				51.0%		41 - 141 %	"			"
<i>Benzo (a) pyrene-d12</i>				62.7%		38 - 143 %	"			"

PSF0519-02 (FO 095694)				Soil			Sampled: 06/09/09 15:00			
Acenaphthene	EPA 8270m	ND	----	23.6	ug/kg dry	1x	9060620	06/17/09 15:10	06/23/09 15:16	
Acenaphthylene	"	ND	----	23.6	"	"	"	"	"	
Anthracene	"	ND	----	23.6	"	"	"	"	"	
Benzo (a) anthracene	"	ND	----	23.6	"	"	"	"	"	
Benzo (a) pyrene	"	ND	----	23.6	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	----	23.6	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	----	23.6	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	----	23.6	"	"	"	"	"	
Chrysene	"	29.0	----	23.6	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	----	23.6	"	"	"	"	"	
Fluoranthene	"	33.6	----	23.6	"	"	"	"	"	
Fluorene	"	ND	----	23.6	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	----	23.6	"	"	"	"	"	
Naphthalene	"	ND	----	23.6	"	"	"	"	"	
Phenanthrene	"	ND	----	23.6	"	"	"	"	"	

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Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
---------	--------	--------	------	-----	-------	-----	-------	----------	----------	-------

PSF0519-02 (FO 095694)

Soil

Sampled: 06/09/09 15:00

Pyrene	EPA 8270m	25.1	----	23.6	ug/kg dry	1x	9060620	06/17/09 15:10	06/23/09 15:16	
Surrogate(s): Fluorene-d10				68.4%		24 - 125 %	"			"
Pyrene-d10				50.2%		41 - 141 %	"			"
Benzo (a) pyrene-d12				61.0%		38 - 143 %	"			"

PSF0519-03 (FO 095695)

Soil

Sampled: 06/10/09 13:15

RL3

Acenaphthene	EPA 8270m	ND	----	203	ug/kg dry	10x	9060620	06/17/09 15:10	06/18/09 17:44	
Acenaphthylene	"	ND	----	203	"	"	"	"	"	
Anthracene	"	ND	----	203	"	"	"	"	"	
Benzo (a) anthracene	"	429	----	203	"	"	"	"	"	
Benzo (a) pyrene	"	390	----	203	"	"	"	"	"	
Benzo (b) fluoranthene	"	393	----	203	"	"	"	"	"	
Benzo (ghi) perylene	"	372	----	203	"	"	"	"	"	
Benzo (k) fluoranthene	"	372	----	203	"	"	"	"	"	
Chrysene	"	568	----	203	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	----	203	"	"	"	"	"	
Fluoranthene	"	1070	----	203	"	"	"	"	"	
Fluorene	"	ND	----	203	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	295	----	203	"	"	"	"	"	
Naphthalene	"	ND	----	203	"	"	"	"	"	
Phenanthrene	"	611	----	203	"	"	"	"	"	
Pyrene	"	781	----	203	"	"	"	"	"	
Surrogate(s): Fluorene-d10				77.0%		24 - 125 %	"			"
Pyrene-d10				64.9%		41 - 141 %	"			"
Benzo (a) pyrene-d12				74.1%		38 - 143 %	"			"

PSF0519-04 (FO 095696)

Soil

Sampled: 06/10/09 15:55

RL3

Acenaphthene	EPA 8270m	ND	----	223	ug/kg dry	10x	9060620	06/17/09 15:10	06/18/09 18:15	
Acenaphthylene	"	ND	----	223	"	"	"	"	"	
Anthracene	"	ND	----	335	"	"	"	"	"	RL1
Benzo (a) anthracene	"	267	----	223	"	"	"	"	"	
Benzo (a) pyrene	"	284	----	223	"	"	"	"	"	
Benzo (b) fluoranthene	"	360	----	223	"	"	"	"	"	
Benzo (ghi) perylene	"	451	----	223	"	"	"	"	"	
Benzo (k) fluoranthene	"	257	----	223	"	"	"	"	"	
Chrysene	"	706	----	223	"	"	"	"	"	

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Polynuclear Aromatic Compounds per EPA 8270M-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-04 (FO 095696)		Soil		Sampled: 06/10/09 15:55						RL3
Dibenzo (a,h) anthracene	EPA 8270m	ND	----	223	ug/kg dry	10x	9060620	06/17/09 15:10	06/18/09 18:15	
Fluoranthene	"	934	----	223	"	"	"	"	"	
Fluorene	"	ND	----	447	"	"	"	"	"	RL1
Indeno (1,2,3-cd) pyrene	"	ND	----	223	"	"	"	"	"	
Naphthalene	"	ND	----	223	"	"	"	"	"	
Phenanthrene	"	1250	----	223	"	"	"	"	"	
Pyrene	"	1210	----	223	"	"	"	"	"	
<i>Surrogate(s): Fluorene-d10</i>				118%		24 - 125 %	"			"
<i>Pyrene-d10</i>				82.6%		41 - 141 %	"			"
<i>Benzo (a) pyrene-d12</i>				102%		38 - 143 %	"			"
PSF0519-05 (FO 095697)		Soil		Sampled: 06/09/09 00:00						
Acenaphthene	EPA 8270m	ND	----	23.5	ug/kg dry	1x	9060620	06/17/09 15:10	06/23/09 15:47	
Acenaphthylene	"	ND	----	23.5	"	"	"	"	"	
Anthracene	"	ND	----	23.5	"	"	"	"	"	
Benzo (a) anthracene	"	ND	----	23.5	"	"	"	"	"	
Benzo (a) pyrene	"	ND	----	23.5	"	"	"	"	"	
Benzo (b) fluoranthene	"	ND	----	23.5	"	"	"	"	"	
Benzo (ghi) perylene	"	ND	----	23.5	"	"	"	"	"	
Benzo (k) fluoranthene	"	ND	----	23.5	"	"	"	"	"	
Chrysene	"	ND	----	23.5	"	"	"	"	"	
Dibenzo (a,h) anthracene	"	ND	----	23.5	"	"	"	"	"	
Fluoranthene	"	ND	----	23.5	"	"	"	"	"	
Fluorene	"	ND	----	23.5	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	"	ND	----	23.5	"	"	"	"	"	
Naphthalene	"	ND	----	23.5	"	"	"	"	"	
Phenanthrene	"	ND	----	23.5	"	"	"	"	"	
Pyrene	"	ND	----	23.5	"	"	"	"	"	
<i>Surrogate(s): Fluorene-d10</i>				66.0%		24 - 125 %	"			"
<i>Pyrene-d10</i>				48.9%		41 - 141 %	"			"
<i>Benzo (a) pyrene-d12</i>				60.9%		38 - 143 %	"			"

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Phthalates per EPA 8270-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-01 (FO 095693)			Soil		Sampled: 06/09/09 13:59					RL3
Dimethyl phthalate	EPA 8270m	ND	----	2910	ug/kg dry	50x	9060620	06/17/09 15:10	06/25/09 06:37	
Diethyl phthalate	"	ND	----	2910	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	----	2910	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	----	2910	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	26900	----	2910	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	----	4370	"	"	"	"	"	RL1
<i>Surrogate(s): 2-Fluorobiphenyl</i>				NR		10 - 150 %	"		"	Z3
<i>p-Terphenyl-d14</i>				NR		10 - 150 %	"		"	Z3
PSF0519-02 (FO 095694)			Soil		Sampled: 06/09/09 15:00					
Dimethyl phthalate	EPA 8270m	ND	----	47.1	ug/kg dry	1x	9060620	06/17/09 15:10	06/26/09 18:12	
Diethyl phthalate	"	ND	----	47.1	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	----	47.1	"	"	"	"	"	
Butyl benzyl phthalate	"	54.7	----	47.1	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	256	----	47.1	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	----	70.7	"	"	"	"	"	RL1
<i>Surrogate(s): 2-Fluorobiphenyl</i>				46.2%		10 - 150 %	"		"	
<i>p-Terphenyl-d14</i>				113%		10 - 150 %	"		"	
PSF0519-03 (FO 095695)			Soil		Sampled: 06/10/09 13:15					RL3
Dimethyl phthalate	EPA 8270m	ND	----	2030	ug/kg dry	50x	9060620	06/17/09 15:10	06/25/09 23:20	
Diethyl phthalate	"	ND	----	2030	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	----	2030	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	----	2030	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	7430	----	2030	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	----	2030	"	"	"	"	"	
<i>Surrogate(s): 2-Fluorobiphenyl</i>				NR		10 - 150 %	"		"	Z3
<i>p-Terphenyl-d14</i>				NR		10 - 150 %	"		"	Z3
PSF0519-04 (FO 095696)			Soil		Sampled: 06/10/09 15:55					RL3
Dimethyl phthalate	EPA 8270m	ND	----	2230	ug/kg dry	50x	9060620	06/17/09 15:10	06/25/09 23:56	
Diethyl phthalate	"	ND	----	2230	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	----	2230	"	"	"	"	"	
Butyl benzyl phthalate	"	ND	----	2230	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	27700	----	2230	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	----	2230	"	"	"	"	"	

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Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Phthalates per EPA 8270-SIM

TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-04 (FO 095696)				Soil				Sampled: 06/10/09 15:55		RL3
Surrogate(s): 2-Fluorobiphenyl				NR		10 - 150 %	50x		06/25/09 23:56	Z3
p-Terphenyl-d14				NR		10 - 150 %	"		"	Z3
PSF0519-05 (FO 095697)				Soil				Sampled: 06/09/09 00:00		
Dimethyl phthalate	EPA 8270m	ND	----	47.0	ug/kg dry	1x	9060620	06/17/09 15:10	06/26/09 18:49	
Diethyl phthalate	"	ND	----	47.0	"	"	"	"	"	
Di-n-butyl phthalate	"	ND	----	47.0	"	"	"	"	"	
Butyl benzyl phthalate	"	48.1	----	47.0	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	"	211	----	47.0	"	"	"	"	"	
Di-n-octyl phthalate	"	ND	----	47.0	"	"	"	"	"	
Surrogate(s): 2-Fluorobiphenyl				46.7%		10 - 150 %	"		"	
p-Terphenyl-d14				73.8%		10 - 150 %	"		"	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/17/09 12:07

Percent Dry Weight (Solids) per ASTM D2216-80
TestAmerica Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-01 (FO 095693)					Soil					Sampled: 06/09/09 13:59
% Solids	NCA SOP	45.9	-----	0.0100	% by Weight	1x	9060619	06/16/09 18:07	06/16/09 18:07	
PSF0519-02 (FO 095694)					Soil					Sampled: 06/09/09 15:00
% Solids	NCA SOP	56.5	-----	0.0100	% by Weight	1x	9060619	06/16/09 18:07	06/16/09 18:07	
PSF0519-03 (FO 095695)					Soil					Sampled: 06/10/09 13:15
% Solids	NCA SOP	65.9	-----	0.0100	% by Weight	1x	9060619	06/16/09 18:07	06/16/09 18:07	
PSF0519-04 (FO 095696)					Soil					Sampled: 06/10/09 15:55
% Solids	NCA SOP	59.7	-----	0.0100	% by Weight	1x	9060619	06/16/09 18:07	06/16/09 18:07	
PSF0519-05 (FO 095697)					Soil					Sampled: 06/09/09 00:00
% Solids	NCA SOP	56.5	-----	0.0100	% by Weight	1x	9060619	06/16/09 18:07	06/16/09 18:07	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Organic Carbon, Total (TOC) TestAmerica Connecticut

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0519-01 (FO 095693)			Soil							Sampled: 06/09/09 13:59
Total Organic Carbon - Duplicates	9060	52200	10.4	100	mg/Kg	1x	28636	06/29/09 18:26	06/29/09 18:26	
PSF0519-02 (FO 095694)			Soil							Sampled: 06/09/09 15:00
Total Organic Carbon - Duplicates	9060	13700	10.4	100	mg/Kg	1x	28636	06/29/09 18:40	06/29/09 18:40	
PSF0519-03 (FO 095695)			Soil							Sampled: 06/10/09 13:15
Total Organic Carbon - Duplicates	9060	38400	10.4	100	mg/Kg	1x	28636	06/29/09 18:53	06/29/09 18:53	
PSF0519-04 (FO 095696)			Soil							Sampled: 06/10/09 15:55
Total Organic Carbon - Duplicates	9060	90600	10.4	100	mg/Kg	1x	28636	06/29/09 19:41	06/29/09 19:41	
PSF0519-05 (FO 095697)			Soil							Sampled: 06/09/09 00:00
Total Organic Carbon - Duplicates	9060	19800	10.4	100	mg/Kg	1x	28636	06/29/09 19:55	06/29/09 19:55	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9070017

Soil Preparation Method: EPA 3510/600 Series

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9070017-BLK1)										Extracted: 07/01/09 10:51				
2,4-D	8151mod	ND	---	20.0	ug/kg wet	1x	--	--	--	--	--	--	07/08/09 16:47	
2,4-DB	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
2,4,5-T	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
2,4,5-TP (Silvex)	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Dalapon	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Dicamba	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Dichlorprop	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
Dinoseb	"	ND	---	20.0	"	"	--	--	--	--	--	--	"	
MCPA	"	ND	---	2000	"	"	--	--	--	--	--	--	"	
MCPP	"	ND	---	2000	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid										Recovery: 89.2%	Limits: 30-140%		"	07/08/09 16:47

LCS (9070017-BS1)

										Extracted: 07/01/09 10:51				
2,4-D	8151mod	86.8	---	20.0	ug/kg wet	1x	--	80.0	108%	(30-120)	--	--	07/08/09 17:26	
2,4-DB	"	99.0	---	20.0	"	"	--	"	124%	(30-130)	--	--	"	
2,4,5-T	"	86.2	---	20.0	"	"	--	"	108%	(25-125)	--	--	"	
2,4,5-TP (Silvex)	"	78.9	---	20.0	"	"	--	"	98.6%	(35-100)	--	--	"	
Dalapon	"	60.7	---	20.0	"	"	--	"	75.9%	(20-110)	--	--	"	
Dicamba	"	88.3	---	20.0	"	"	--	"	110%	(30-115)	--	--	"	
Dichlorprop	"	79.3	---	20.0	"	"	--	"	99.1%	(50-100)	--	--	"	
Dinoseb	"	85.2	---	20.0	"	"	--	"	107%	(10-130)	--	--	"	
MCPA	"	7910	---	2000	"	"	--	8000	98.8%	(30-105)	--	--	"	
MCPP	"	7770	---	2000	"	"	--	"	97.2%	(15-115)	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid										Recovery: 108%	Limits: 45-125%		"	07/08/09 17:26

Matrix Spike (9070017-MS1)

										QC Source: PSF0519-05RE1				
										Extracted: 07/01/09 10:51				
2,4-D	8151mod	203	---	142	ug/kg dry	4x	ND	142	143%	(15-110)	--	--	07/08/09 21:20	M7
2,4-DB	"	220	---	142	"	"	ND	"	156%	(10-135)	--	--	"	M7
2,4,5-T	"	202	---	142	"	"	ND	"	143%	(15-120)	--	--	"	M7
2,4,5-TP (Silvex)	"	165	---	142	"	"	ND	"	117%	(20-105)	--	--	"	M7
Dalapon	"	149	---	142	"	"	ND	"	105%	(15-105)	--	--	"	
Dicamba	"	189	---	142	"	"	ND	"	134%	"	--	--	"	M7
Dichlorprop	"	187	---	142	"	"	ND	"	132%	(25-105)	--	--	"	M7
Dinoseb	"	187	---	142	"	"	ND	"	132%	(15-125)	--	--	"	M7
MCPA	"	17800	---	14200	"	"	ND	14200	125%	(15-105)	--	--	"	M7
MCPP	"	18800	---	14200	"	"	ND	"	132%	(15-110)	--	--	"	M7
Surrogate(s): 2,4-Dichlorophenylacetic acid										Recovery: 122%	Limits: 20-125%		"	07/08/09 21:20

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Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9070017

Soil Preparation Method: EPA 3510/600 Series

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (9070017-MSD1)			QC Source: PSF0519-05RE1					Extracted: 07/01/09 10:51						
2,4-D	8151mod	204	---	142	ug/kg dry	4x	ND	142	144%	(15-110)	0.783% (30)	07/08/09 21:59	M7	
2,4-DB	"	212	---	142	"	"	ND	"	150%	(10-135)	3.99% (40)	"	M7	
2,4,5-T	"	198	---	142	"	"	ND	"	140%	(15-120)	1.94% "	"	M7	
2,4,5-TP (Silvex)	"	156	---	142	"	"	ND	"	110%	(20-105)	5.96% "	"	M7	
Dalapon	"	147	---	142	"	"	ND	"	104%	(15-105)	1.50% "	"		
Dicamba	"	178	---	142	"	"	ND	"	126%	"	5.89% "	"	M7	
Dichlorprop	"	173	---	142	"	"	ND	"	122%	(25-105)	7.71% "	"	M7	
Dinoseb	"	169	---	142	"	"	ND	"	120%	(15-125)	10.2% "	"		
MCPA	"	18200	---	14200	"	"	ND	14200	128%	(15-105)	2.27% "	"	M7	
MCPP	"	18100	---	14200	"	"	ND	"	128%	(15-110)	3.71% "	"	M7	

Surrogate(s): 2,4-Dichlorophenylacetic acid

Recovery: 120%

Limits: 20-125% "

07/08/09 21:59

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Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9060620

Soil Preparation Method: EPA 3550

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9060620-BLK1)										Extracted: 06/17/09 15:10				
Acenaphthene	EPA 8270m	ND	---	13.4	ug/kg wet	1x	--	--	--	--	--	--	06/18/09 12:30	
Acenaphthylene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Anthracene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Benzo (a) anthracene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Benzo (a) pyrene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Benzo (b) fluoranthene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Benzo (ghi) perylene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Benzo (k) fluoranthene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Chrysene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Dibenzo (a,h) anthracene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Fluoranthene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Fluorene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Indeno (1,2,3-cd) pyrene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Naphthalene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Phenanthrene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
Pyrene	"	ND	---	13.4	"	"	--	--	--	--	--	--	"	
<hr/>														
Surrogate(s): Fluorene-d10		Recovery:	47.0%	Limits:	24-125%	"								
Pyrene-d10			71.0%		41-141%	"								
Benzo (a) pyrene-d12			75.6%		38-143%	"								

LCS (9060620-BS1)

Extracted: 06/17/09 15:10

Acenaphthene	EPA 8270m	146	---	13.4	ug/kg wet	1x	--	166	88.0%	(33-139)	--	--	06/18/09 11:58	
Benzo (a) pyrene	"	146	---	13.4	"	"	--	"	87.7%	(45-149)	--	--	"	
Pyrene	"	127	---	13.4	"	"	--	"	76.3%	(39-138)	--	--	"	
<hr/>														
Surrogate(s): Fluorene-d10		Recovery:	37.6%	Limits:	24-125%	"								
Pyrene-d10			69.0%		41-141%	"								
Benzo (a) pyrene-d12			76.8%		38-143%	"								

Matrix Spike (9060620-MS1)

QC Source: PSF0346-03

Extracted: 06/17/09 15:10

Acenaphthene	EPA 8270m	374	---	152	ug/kg dry	10x	96.1	189	147%	(33-139)	--	--	06/18/09 13:32	M7
Benzo (a) pyrene	"	156	---	152	"	"	ND	"	82.3%	(45-149)	--	--	"	
Pyrene	"	277	---	152	"	"	74.2	"	107%	(39-138)	--	--	"	
<hr/>														
Surrogate(s): Fluorene-d10		Recovery:	85.9%	Limits:	24-125%	"								
Pyrene-d10			77.5%		41-141%	"								
Benzo (a) pyrene-d12			85.1%		38-143%	"								

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Polynuclear Aromatic Compounds per EPA 8270M-SIM - Laboratory Quality Control Results
TestAmerica Portland

QC Batch: 9060620 Soil Preparation Method: EPA 3550

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (9060620-MSD1)			QC Source: PSF0346-03					Extracted: 06/17/09 15:10						
Acenaphthene	EPA 8270m	264	---	152	ug/kg dry	10x	96.1	189	89.0%	(33-139)	34.5%	(60)	06/18/09 14:04	
Benzo (a) pyrene	"	146	---	152	"	"	ND	"	77.3%	(45-149)	6.50%	"	"	
Pyrene	"	207	---	152	"	"	74.2	"	70.1%	(39-138)	29.1%	"	"	
<i>Surrogate(s): Fluorene-d10 Recovery: 89.0% Limits: 24-125% "</i>														
<i>Pyrene-d10 75.4% 41-141% "</i>														
<i>Benzo (a) pyrene-d12 79.9% 38-143% "</i>														

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Phthalates per EPA 8270-SIM - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9060620

Soil Preparation Method: EPA 3550

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
---------	--------	--------	------	-----	-------	-----	---------------	-----------	-------	----------	-------	----------	----------	-------

Blank (9060620-BLK1)

Extracted: 06/17/09 15:10

Dimethyl phthalate	EPA 8270m	ND	---	26.8	ug/kg wet	1x	--	--	--	--	--	--	06/24/09 22:11	
Diethyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Di-n-butyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Butyl benzyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Bis(2-ethylhexyl)phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Di-n-octyl phthalate	"	ND	---	26.8	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		Recovery: 50.6%		Limits: 10-150%	"								06/24/09 22:11	
p-Terphenyl-d14		108%		10-150%	"								"	

LCS (9060620-BS1)

Extracted: 06/17/09 15:10

Dimethyl phthalate	EPA 8270m	111	---	26.7	ug/kg wet	1x	--	133	83.7%	(20-150)	--	--	06/24/09 22:47	
Diethyl phthalate	"	127	---	26.7	"	"	--	"	95.4%	"	--	--	"	
Di-n-butyl phthalate	"	144	---	26.7	"	"	--	"	108%	"	--	--	"	
Butyl benzyl phthalate	"	162	---	26.7	"	"	--	"	122%	"	--	--	"	
Bis(2-ethylhexyl)phthalate	"	147	---	26.7	"	"	--	"	110%	"	--	--	"	
Di-n-octyl phthalate	"	128	---	26.7	"	"	--	"	96.4%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		Recovery: 23.8%		Limits: 10-150%	"								06/24/09 22:47	
p-Terphenyl-d14		98.2%		10-150%	"								"	

Matrix Spike (9060620-MS1)

QC Source: PSF0346-03

Extracted: 06/17/09 15:10

Dimethyl phthalate	EPA 8270m	145	---	152	ug/kg dry	5x	ND	152	95.6%	(10-150)	--	--	06/25/09 20:56	
Diethyl phthalate	"	124	---	152	"	"	ND	"	81.7%	"	--	--	"	
Di-n-butyl phthalate	"	151	---	152	"	"	ND	"	99.9%	"	--	--	"	
Butyl benzyl phthalate	"	152	---	152	"	"	ND	"	100%	"	--	--	"	
Bis(2-ethylhexyl)phthalate	"	165	---	152	"	"	ND	"	109%	"	--	--	"	
Di-n-octyl phthalate	"	138	---	152	"	"	ND	"	91.0%	"	--	--	"	
Surrogate(s): 2-Fluorobiphenyl		Recovery: 44.7%		Limits: 10-150%	"								06/25/09 20:56	
p-Terphenyl-d14		89.3%		10-150%	"								"	

Matrix Spike Dup (9060620-MSD1)

QC Source: PSF0346-03

Extracted: 06/17/09 15:10

Dimethyl phthalate	EPA 8270m	123	---	152	ug/kg dry	5x	ND	151	81.7%	(10-150)	15.9%	(50)	06/25/09 21:32	
Diethyl phthalate	"	143	---	152	"	"	ND	"	94.4%	"	14.2%	"	"	
Di-n-butyl phthalate	"	169	---	152	"	"	ND	"	111%	"	10.7%	"	"	
Butyl benzyl phthalate	"	154	---	152	"	"	ND	"	102%	"	1.41%	"	"	
Bis(2-ethylhexyl)phthalate	"	163	---	152	"	"	ND	"	108%	"	0.717%	"	"	
Di-n-octyl phthalate	"	140	---	152	"	"	ND	"	92.3%	"	1.15%	"	"	
Surrogate(s): 2-Fluorobiphenyl		Recovery: 36.7%		Limits: 10-150%	"								06/25/09 21:32	
p-Terphenyl-d14		104%		10-150%	"								"	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/17/09 12:07

Organic Carbon, Total (TOC) - Laboratory Quality Control Results

TestAmerica Connecticut

QC Batch: 28636

Soil Preparation Method: NA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (220-28636-5)			QC Source:						Extracted: 06/29/09 18:13					
Total Organic Carbon - Duplicates	9060	3771	10.4	100	mg/Kg	1x	--	3530	107%	(28-172)	--	--	06/29/09 18:13	
Blank (220-28636-6)			QC Source:						Extracted: 06/29/09 18:19					
Total Organic Carbon - Duplicates	9060	ND	10.4	100	mg/Kg	1x	--	--	--	--	--	--	06/29/09 18:19	
Matrix Spike (93873S)			QC Source: PSF0519-03						Extracted: 06/29/09 19:35					
Total Organic Carbon - Duplicates	9060	142200	10.4	100	mg/Kg	1x	38400	110000	94%	(75-125)	--	--	06/29/09 19:35	
Duplicate (93873X)			QC Source: PSF0519-03						Extracted: 06/29/09 19:07					
Total Organic Carbon - Duplicates	9060	39630	10.4	100	mg/Kg	1x	38400	--	--	--	3%	(20)	06/29/09 19:07	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/17/09 12:07

Notes and Definitions

Report Specific Notes:

- H4 - Sample was extracted past holding time, but analyzed within analysis holding time.
- M7 - The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).
- N1 - See case narrative.
- RL1 - Reporting limit raised due to sample matrix effects.
- RL3 - Reporting limit raised due to high concentrations of non-target analytes.
- Z3 - The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland



Howard Holmes, Project Manager

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244
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425-420-9200 FAX 420-9210
509-924-9200 FAX 924-9290
503-906-9200 FAX 906-9210
907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: **PSF6519**

CLIENT: City of Portland		INVOICE TO: Charles Lytle		TURNAROUND REQUEST	
REPORT TO ADDRESS: Jennifer Shackelford		PO NUMBER: 36238		in Business Days *	
PHONE: FAX:		PRESERVATIVE		<input checked="" type="checkbox"/> Organic & Inorganic Analyses <input checked="" type="checkbox"/> Petroleum Hydrocarbon Analyses <input type="checkbox"/> STD.	
PROJECT NAME: Portland Harbor		REQUESTED ANALYSES		<input type="checkbox"/> OTHER Specify:	
PROJECT NUMBER: Stormwater Sampl				* Turnaround Requests less than standard may incur Rush Charges.	
SAMPLED BY:				MATRIX (W, S, O) # OF CONT. LOCATION/ COMMENTS TA WO ID	
CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME			
1. F0095693	6/18/09 1359	X		S	1 TS = 39.22/45.97
2. F0095694	6/19/09 1500	X		S	3 = 56.57
3. F0095695	6/19/09 1315	X		S	2 = 65.97
4. F0095696	↓ 1555	X		S	1 = 59.47
5. F0095697	6/19/09 —	X		S	3 ↓ = 56.57
6.					
7.					
8.					
9.					
10.					
RELEASED BY: Robert Lytle		DATE: 6/16/09		DATE: 6/16/09	
PRINT NAME: Robert Lytle		FIRM: TAP		FIRM: TAP	
RELEASED BY: Robert Lytle		DATE: 11.25		DATE: 11.25	
PRINT NAME: Robert Lytle		FIRM: TAP		FIRM: TAP	
RELEASED BY: Robert Lytle		DATE: 6/16/09		DATE: 6/16/09	
PRINT NAME: Robert Lytle		FIRM: TAP		FIRM: TAP	
ADDITIONAL REMARKS:		TEMP: 1.7		PAGE 1 OF 1	

() Please use custom KIC Analyte list.

() Please use total solids results provided due to low sample volume. Thanks.

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PSF0519 Date/Time Received: July 10, 1430
 Client Name and Project: City of Portland Portland Harbor

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ OTHER

Unpacking Checks:

Cooler #(s): _____
 Temperatures: 2.7 _____
 Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☐ Plastic ☒ Glass)

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
☐ Other: _____

N/A Yes No

Initials: PS

- | | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. If ESI client, were temp blanks received? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. Chain of Custody present? If no, document on NOD. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Bottles received intact? If no, document on NOD. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 5. Sample is not multiphasic? If no, document on NOD. |
| | <input type="checkbox"/> | <input type="checkbox"/> | 6. Proper Container and preservatives used? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. pH of all samples checked and meet requirements? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. HF Dilution required? |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 11. Did chain of custody agree with samples received? If no, document on NOD. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 12. Is the "Sampled by" section of the COC completed? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13. Were VOA/Oil Syringe samples without headspace? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14. Were VOA vials preserved? <input type="checkbox"/> HCl <input type="checkbox"/> Sodium Thiosulfate <input type="checkbox"/> Ascorbic Acid |
| | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 15. Did samples require preservation with sodium thiosulfate? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 16. If yes to #14, was the residual chlorine test negative? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 19. Are analyses with short holding times received in hold? |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 20. Was Standard Turn Around (TAT) requested? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM. |

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PSF0519

Login Checks:

Initials: PS

N/A Yes No

- ☒ ☐ 22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
- ☒ ☐ 23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
- ☒ ☐ 24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
- ☒ ☐ 25. Were special log in instructions read and followed?
- ☒ ☐ 26. Were tests logged checked against the COC?
- ☒ ☐ 27. Were rush notices printed and delivered?
- ☒ ☐ 28. Were short hold notices printed and delivered?
- ☐ ☒ 29. Were subcontract COCs printed?
- ☒ ☐ 30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: PS

N/A Yes No

- ☐ ☒ 31. Were the subcontracted samples/containers put in Sx fridge?
- ☒ ☐ 32. Were sample bottles and COC double checked for dissolved/filtered metals?
- ☐ ☒ 33. Did the sample ID, Date, and Time from label match what was logged?
- ☒ ☐ 34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
- ☒ ☐ 35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
- ☒ ☐ 36. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).



City of Portland
Chain-of-Custody
Bureau of Environmental Services



Date: 6/11/09
Page: 1 of 1

Collected By: JMB/PTB/ATA
JSM/LAP

Project Name: PORTLAND HARBOR STORMWATER SAMP
File Number: 1020.005

Matrix: SEDIMENT

Requested Analyses

Basin 18 Sediment Trap Pilot Study Chain-of-custody

Sediment traps installed: 10/30/08 (18_ST2), 12/4/08 (18_ST5), 12/9/08 (18_ST3, 18_ST4), 2/4/09 (18_ST1)
Sediment traps removed: 6/4/09 (All Of 18 sites)

* Total Solids to be done at WPCL, care should be taken to use the smallest aliquot possible to retain sample volume for additional follow-up analyses.

WPCL Sample I.D.

Location

Point Code

Sample Date

Sample Time

Sample Type

Organics

General

Metals

Comments

ST-18-AAT565-0609
NW 35th & YEON

18_ST1 6/11/09 805 C

PCB Aroclors (Low-level)

Pesticides (Low-level CAS)

SVOCs (low-level CAS)

PAH + Phthalates (Low-level)

Herbicides (TA)

Grain Size

TOC

TS*

Total Metals (As, Cd Cr, Cu, Pb, Mn, Ni, Ag, Zn) + Hg

41.5 g Total Wet Weight

45.9%

223.3 g Total Wet Weight

56.5%

390.8 g Total Wet Weight

386.0 g Total Wet Weight

492.2 g Total Wet Weight

163.4 g Total Wet Weight

56.5%

59.7%

65.9%

71.1%

76.3%

81.5%

86.7%

91.9%

97.1%

102.3%

107.5%

112.7%

117.9%

123.1%

128.3%

133.5%

138.7%

143.9%

149.1%

154.3%

159.5%

164.7%

169.9%

175.1%

180.3%

185.5%

190.7%

195.9%

201.1%

206.3%

211.5%

216.7%

221.9%

227.1%

232.3%

237.5%

242.7%

247.9%

253.1%

258.3%

263.5%

268.7%

273.9%

279.1%

284.3%

289.5%

294.7%

299.9%

305.1%

310.3%

315.5%

320.7%

325.9%

331.1%

336.3%

341.5%

346.7%

351.9%

357.1%

362.3%

367.5%

372.7%

377.9%

383.1%

388.3%

393.5%

398.7%

403.9%

409.1%

414.3%

419.5%

424.7%

429.9%

435.1%

440.3%

445.5%

450.7%

455.9%

461.1%

466.3%

471.5%

476.7%

481.9%

487.1%

492.3%

497.5%

502.7%

507.9%

513.1%

518.3%

523.5%

528.7%

533.9%

539.1%

544.3%

549.5%

554.7%

559.9%

565.1%

570.3%

575.5%

580.7%

585.9%

591.1%

596.3%

601.5%

606.7%

611.9%

617.1%

622.3%

627.5%

632.7%

637.9%

643.1%

648.3%

653.5%

658.7%

663.9%

669.1%

674.3%

679.5%

684.7%

689.9%

695.1%

700.3%

705.5%

710.7%

715.9%

721.1%

726.3%

731.5%

736.7%

741.9%

747.1%

752.3%

757.5%

762.7%

767.9%

773.1%

778.3%

783.5%

788.7%

793.9%

799.1%

804.3%

809.5%

814.7%

819.9%

825.1%

830.3%

835.5%

840.7%

845.9%

851.1%

856.3%

861.5%

866.7%

871.9%

877.1%

882.3%

887.5%

892.7%

897.9%

903.1%

908.3%

913.5%

918.7%

923.9%

929.1%

934.3%

939.5%

944.7%

949.9%

955.1%

960.3%

965.5%

970.7%

975.9%

981.1%

986.3%

991.5%

996.7%

1001.9%

1007.1%

1012.3%

1017.5%

1022.7%

1027.9%

1033.1%

1038.3%

1043.5%

1048.7%

1053.9%

1059.1%

1064.3%

1069.5%

1074.7%

1079.9%

1085.1%

1090.3%

1095.5%

1100.7%

1105.9%

1111.1%

1116.3%

1121.5%

1126.7%

1131.9%

1137.1%

1142.3%

1147.5%

1152.7%

1157.9%

1163.1%

1168.3%

1173.5%

1178.7%

1183.9%

1189.1%

1194.3%

1199.5%

1204.7%

1209.9%

1215.1%

1220.3%

1225.5%

1230.7%

1235.9%

1241.1%

1246.3%

1251.5%

1256.7%

1261.9%

1267.1%

1272.3%

1277.5%

1282.7%

1287.9%

1293.1%

1298.3%

1303.5%

1308.7%

1313.9%

1319.1%

1324.3%

1329.5%

1334.7%

1339.9%

1345.1%

1350.3%

1355.5%

1360.7%

1365.9%

1371.1%

1376.3%

1381.5%

1386.7%

1391.9%

1397.1%

1402.3%

1407.5%



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095692

Sample Collected: 06/11/09 08:05
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT565-0609
NW 35TH & YEON / US OF CB INLET AT MH
Sample Point Code: 18_ST1
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AN06039
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML/L

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	39.2	% W/W	0.01	SM 2540 G	06/11/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	169000	mg/Kg dry wt	500	EPA 9060 MOD	06/18/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<5.9	µg/Kg dry wt	5.9	EPA 8081A	06/18/09
4,4'-DDE	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
4,4'-DDT	<19	µg/Kg dry wt	19	EPA 8081A	06/18/09
Aldrin	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Alpha-BHC	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Alpha-Chlordane	<11	µg/Kg dry wt	11	EPA 8081A	06/18/09
Beta-BHC	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Delta-BHC	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Dieldrin	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Endosulfan I	<9.3	µg/Kg dry wt	9.3	EPA 8081A	06/18/09
Endosulfan II	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Endosulfan Sulfate	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Endrin	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Endrin Aldehyde	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Endrin Ketone	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Gamma-BHC(Lindane)	EST 12	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Gamma-Chlordane	20	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Heptachlor	EST 9.4	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Heptachlor Epoxide	<5.7	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Methoxychlor	14	µg/Kg dry wt	5.7	EPA 8081A	06/18/09
Toxaphene	<370	µg/Kg dry wt	370	EPA 8081A	06/18/09

End of Report for Sample ID: FO095692

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095693**

Sample Collected: 06/09/09 13:59
Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT557-0609
3950 NW YEON AVE / US OF MANHOLE
Sample Point Code: 18_ST2
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3

System ID: AN06040
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJWL

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: MRLs are raised for PCB Aroclor analysis due to the low level of solids in the sample. Traces of Aroclors 1254 and 1260 were evident but at concentrations below the MRLs.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	45.9	% W/W	0.01	SM 2540 G	06/11/09
METALS					
ARSENIC	4.75	mg/Kg dry wt	0.50	EPA 6020	06/24/09
CADMIUM	0.34	mg/Kg dry wt	0.10	EPA 6020	06/24/09
CHROMIUM	43.8	mg/Kg dry wt	0.50	EPA 6020	06/24/09
COPPER	46.9	mg/Kg dry wt	0.25	EPA 6020	06/24/09
LEAD	22.6	mg/Kg dry wt	0.10	EPA 6020	06/24/09
MANGANESE	754	mg/Kg dry wt	1.0	EPA 6020	06/24/09
MERCURY	0.260	mg/Kg dry wt	0.010	EPA 6020	06/24/09
NICKEL	30.2	mg/Kg dry wt	0.25	EPA 6020	06/24/09
SILVER	0.24	mg/Kg dry wt	0.10	EPA 6020	06/24/09
ZINC	172	mg/Kg dry wt	0.50	EPA 6020	06/24/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1221	<40	µg/Kg dry wt	40	EPA 8082	06/24/09
Aroclor 1232	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1248	<40	µg/Kg dry wt	40	EPA 8082	06/24/09
Aroclor 1254	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1260	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1262	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1268	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	52200	mg/Kg dry wt	100	EPA 9060 MOD	06/29/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	55	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
4,4'-DDE	66	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
4,4'-DDT	<23	µg/Kg dry wt	23	EPA 8081A	06/18/09
Aldrin	78	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Alpha-BHC	<2.2	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Alpha-Chlordane	52	µg/Kg dry wt	2.2	EPA 8081A	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095693

Sample Collected: 06/09/09 13:59

**Sample Status: COMPLETE AND
VALIDATED**

Sample Received: 06/11/09

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP

Report Page: Page 2 of 3

Address/Location: ST-18-AAT557-0609

3950 NW YEON AVE / US OF MANHOLE

System ID: AN06040

Sample Point Code: 18_ST2

EID File #: 1020.005

Sample Type: COMPOSITE

LocCode: PORTHASW

Sample Matrix: SEDIMENT

Collected By: JXB/PTB/AJA/JJM/L

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: MRLs are raised for PCB Aroclor analysis due to the low level of solids in the sample. Traces of Aroclors 1254 and 1260 were evident but at concentrations below the MRLs.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Beta-BHC	<2.2	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Delta-BHC	<4.8	µg/Kg dry wt	4.8	EPA 8081A	06/18/09
Dieldrin	EST 3.8	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Endosulfan I	<5.2	µg/Kg dry wt	5.2	EPA 8081A	06/18/09
Endosulfan II	<18	µg/Kg dry wt	18	EPA 8081A	06/18/09
Endosulfan Sulfate	2.4	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Endrin	<3.2	µg/Kg dry wt	3.2	EPA 8081A	06/18/09
Endrin Aldehyde	<3.6	µg/Kg dry wt	3.6	EPA 8081A	06/18/09
Endrin Ketone	EST 8.8	µg/Kg dry wt	2.2	EPA 8081A	06/18/09
Gamma-BHC(Lindane)	<7.9	µg/Kg dry wt	7.9	EPA 8081A	06/18/09
Gamma-Chlordane	350	µg/Kg dry wt	11	EPA 8081A	06/18/09
Heptachlor	300	µg/Kg dry wt	11	EPA 8081A	06/18/09
Heptachlor Epoxide	<6.3	µg/Kg dry wt	6.3	EPA 8081A	06/18/09
Methoxychlor	<3.7	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Toxaphene	<790	µg/Kg dry wt	790	EPA 8081A	06/18/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<146	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Acenaphthylene	<146	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Anthracene	247	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Benzo(a)anthracene	163	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Benzo(a)pyrene	186	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Benzo(b)fluoranthene	235	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Benzo(ghi)perylene	267	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Benzo(k)fluoranthene	164	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Bis(2-ethylhexyl) phthalate	26900	µg/Kg dry wt	2910	EPA8270M-SIM	06/17/09
Butyl benzyl phthalate	<2910	µg/Kg dry wt	2910	EPA8270M-SIM	06/17/09
Chrysene	426	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Dibenzo(a,h)anthracene	<146	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Diethyl phthalate	<2910	µg/Kg dry wt	2910	EPA8270M-SIM	06/17/09
Dimethyl phthalate	<2910	µg/Kg dry wt	2910	EPA8270M-SIM	06/17/09
Di-n-butyl phthalate	<2910	µg/Kg dry wt	2910	EPA8270M-SIM	06/17/09
Di-n-octyl phthalate	<4370	µg/Kg dry wt	4370	EPA8270M-SIM	06/17/09
Fluoranthene	491	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095693

Sample Collected: 06/09/09 13:59
Sample Received: 06/11/09

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAT557-0609
3950 NW YEON AVE / US OF MANHOLE
Sample Point Code: 18_ST2
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 3

System ID: AN06040
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML/L

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: MRLs are raised for PCB Aroclor analysis due to the low level of solids in the sample. Traces of Aroclors 1254 and 1260 were evident but at concentrations below the MRLs.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Fluorene	<146	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Indeno(1,2,3-cd)pyrene	150	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Naphthalene	<146	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Phenanthrene	463	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09
Pyrene	586	µg/Kg dry wt	146	EPA8270M-SIM	06/17/09

End of Report for Sample ID: FO095693

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095694

Sample Collected: 06/09/09 15:00
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AND535-0609
4033 NW YEON AVE / 42 INCH LINE US OF MH
Sample Point Code: 18_ST3
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3

System ID: AN06041
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJMW/L

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	56.5	% W/W	0.01	SM 2540 G	06/11/09
METALS					
ARSENIC	2.01	mg/Kg dry wt	0.50	EPA 6020	06/17/09
CADMIUM	0.20	mg/Kg dry wt	0.10	EPA 6020	06/17/09
CHROMIUM	24.3	mg/Kg dry wt	0.50	EPA 6020	06/17/09
COPPER	15.2	mg/Kg dry wt	0.25	EPA 6020	06/17/09
LEAD	12.6	mg/Kg dry wt	0.10	EPA 6020	06/17/09
MANGANESE	901	mg/Kg dry wt	0.5	EPA 6010	06/17/09
MERCURY	0.033	mg/Kg dry wt	0.010	EPA 6020	06/17/09
NICKEL	13.8	mg/Kg dry wt	0.25	EPA 6020	06/17/09
SILVER	<0.10	mg/Kg dry wt	0.10	EPA 6020	06/17/09
ZINC	79.5	mg/Kg dry wt	0.50	EPA 6020	06/17/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1260	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	13700	mg/Kg dry wt	100	EPA 9060 MOD	06/29/09
GRAIN SIZE BY ASTM - ARI					
Clay (<3.2 µm)	6.8	Fract %	0.1	ASTM D421/422	06/18/09
Coarse Sand (4750-2000 µm)	2.8	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (150-75 µm)	13.2	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (250-150 µm)	5.9	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (425-250 µm)	4.5	Fract %	0.1	ASTM D421/422	06/18/09
Gravel (>4750 µm)	0.7	Fract %	0.1	ASTM D421/422	06/18/09
Medium Sand (2000-850 µm)	4.8	Fract %	0.1	ASTM D421/422	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095694

Sample Collected: 06/09/09 15:00
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AND535-0609
4033 NW YEON AVE / 42 INCH LINE US OF MH
Sample Point Code: 18_ST3
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 2 of 3

System ID: AN06041
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Medium Sand (850-425 μ m)	3.5	Fract %	0.1	ASTM D421/422	06/18/09
Silt (13-9 μ m)	1.4	Fract %	0.1	ASTM D421/422	06/18/09
Silt (22-13 μ m)	4.1	Fract %	0.1	ASTM D421/422	06/18/09
Silt (32-22 μ m)	6.8	Fract %	0.1	ASTM D421/422	06/18/09
Silt (7-3.2 μ m)	1.4	Fract %	0.1	ASTM D421/422	06/18/09
Silt (75-32 μ m)	43.0	Fract %	0.1	ASTM D421/422	06/18/09
Silt (9-7 μ m)	1.4	Fract %	0.1	ASTM D421/422	06/18/09
HERBICIDES-CHLORINATED - TA					
2,4,5-T	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4,5-TP (Silvex)	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4-D	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4-DB	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dalapon	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dicamba	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dichlorprop	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dinoseb	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
MCPA	<14.2	mg/Kg dry wt	14.2	EPA 8151	07/01/09
MCPP	<14.2	mg/Kg dry wt	14.2	EPA 8151	07/01/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
4,4'-DDE	1.5	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
4,4'-DDT	<1.1	μ g/Kg dry wt	1.1	EPA 8081A	06/18/09
Aldrin	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Alpha-BHC	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Alpha-Chlordane	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Beta-BHC	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Delta-BHC	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Dieldrin	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endosulfan I	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endosulfan II	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endosulfan Sulfate	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endrin	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endrin Aldehyde	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09
Endrin Ketone	<1.0	μ g/Kg dry wt	1.0	EPA 8081A	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095694

Sample Collected: 06/09/09 15:00
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AND535-0609
4033 NW YEON AVE / 42 INCH LINE US OF MH
Sample Point Code: 18_ST3
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 3

System ID: AN06041
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Gamma-BHC(Lindane)	<1.0	µg/Kg dry wt	1.0	EPA 8081A	06/18/09
Gamma-Chlordane	<1.0	µg/Kg dry wt	1.0	EPA 8081A	06/18/09
Heptachlor	<1.0	µg/Kg dry wt	1.0	EPA 8081A	06/18/09
Heptachlor Epoxide	<1.0	µg/Kg dry wt	1.0	EPA 8081A	06/18/09
Methoxychlor	3.7	µg/Kg dry wt	1.0	EPA 8081A	06/18/09
Toxaphene	<50	µg/Kg dry wt	50	EPA 8081A	06/18/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Acenaphthylene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Anthracene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Benzo(a)anthracene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Benzo(a)pyrene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Benzo(b)fluoranthene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Benzo(ghi)perylene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Benzo(k)fluoranthene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Bis(2-ethylhexyl) phthalate	256	µg/Kg dry wt	47.1	EPA8270M-SIM	06/17/09
Butyl benzyl phthalate	54.7	µg/Kg dry wt	47.1	EPA8270M-SIM	06/17/09
Chrysene	29.0	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Dibenzo(a,h)anthracene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Diethyl phthalate	<47.1	µg/Kg dry wt	47.1	EPA8270M-SIM	06/17/09
Dimethyl phthalate	<47.1	µg/Kg dry wt	47.1	EPA8270M-SIM	06/17/09
Di-n-butyl phthalate	<47.1	µg/Kg dry wt	47.1	EPA8270M-SIM	06/17/09
Di-n-octyl phthalate	<70.7	µg/Kg dry wt	70.7	EPA8270M-SIM	06/17/09
Fluoranthene	33.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Fluorene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Indeno(1,2,3-cd)pyrene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Naphthalene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Phenanthrene	<23.6	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09
Pyrene	25.1	µg/Kg dry wt	23.6	EPA8270M-SIM	06/17/09

End of Report for Sample ID: FO095694

Report Date: 08/07/09

Validated By: 



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095695**

Sample Collected: 06/10/09 13:15
Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-ATT466-0609
4033 NW YEON AVE / 48 INCH LINE DS OF MH
Sample Point Code: 18_ST4
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3

System ID: AN06042
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJWL

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. Extraction holding time was exceeded for Herbicide analysis; results may be low estimates. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: The reporting limit for PCB Aroclor 1248 is raised due non-target interfering compounds, possibly organochlorine pesticides.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	65.9	% W/W	0.01	SM 2540 G	06/11/09
METALS					
ARSENIC	2.85	mg/Kg dry wt	0.50	EPA 6020	06/24/09
CADMIUM	1.01	mg/Kg dry wt	0.10	EPA 6020	06/24/09
CHROMIUM	60.5	mg/Kg dry wt	0.50	EPA 6020	06/24/09
COPPER	67.8	mg/Kg dry wt	0.25	EPA 6020	06/24/09
LEAD	164	mg/Kg dry wt	0.10	EPA 6020	06/24/09
MANGANESE	548	mg/Kg dry wt	1.0	EPA 6020	06/24/09
MERCURY	0.305	mg/Kg dry wt	0.010	EPA 6020	06/24/09
NICKEL	25.5	mg/Kg dry wt	0.25	EPA 6020	06/24/09
SILVER	0.14	mg/Kg dry wt	0.10	EPA 6020	06/24/09
ZINC	436	mg/Kg dry wt	0.50	EPA 6020	06/24/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1248	<100	µg/Kg dry wt	100	EPA 8082	06/24/09
Aroclor 1254	90	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1260	61	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	38400	mg/Kg dry wt	100	EPA 9060 MOD	06/29/09
GRAIN SIZE BY ASTM - ARI					
Clay (<3.2 µm)	11.1	Fract %	0.1	ASTM D421/422	06/18/09
Coarse Sand (4750-2000 µm)	0.3	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (150-75 µm)	10.7	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (250-150 µm)	9.2	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (425-250 µm)	12.4	Fract %	0.1	ASTM D421/422	06/18/09
Gravel (>4750 µm)	<0.1	Fract %	0.1	ASTM D421/422	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095695

Sample Collected: 06/10/09 13:15
Sample Received: 06/11/09

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-ATT466-0609
4033 NW YEON AVE / 48 INCH LINE DS OF MH
Sample Point Code: 18_ST4
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 2 of 3

System ID: AN06042
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Extraction holding time was exceeded for Herbicide analysis; results may be low estimates. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: The reporting limit for PCB Aroclor 1248 is raised due non-target interfering compounds, possibly organochlorine pesticides.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Medium Sand (2000-850 μ m)	2.2	Fract %	0.1	ASTM D421/422	06/18/09
Medium Sand (850-425 μ m)	6.8	Fract %	0.1	ASTM D421/422	06/18/09
Silt (13-9 μ m)	4.2	Fract %	0.1	ASTM D421/422	06/18/09
Silt (22-13 μ m)	5.5	Fract %	0.1	ASTM D421/422	06/18/09
Silt (32-22 μ m)	9.7	Fract %	0.1	ASTM D421/422	06/18/09
Silt (7-3.2 μ m)	3.5	Fract %	0.1	ASTM D421/422	06/18/09
Silt (75-32 μ m)	22.3	Fract %	0.1	ASTM D421/422	06/18/09
Silt (9-7 μ m)	2.1	Fract %	0.1	ASTM D421/422	06/18/09
HERBICIDES-CHLORINATED - TA					
2,4,5-T	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
2,4,5-TP (Silvex)	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
2,4-D	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
2,4-DB	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
Dalapon	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
Dicamba	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
Dichlorprop	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
Dinoseb	<0.607	mg/Kg dry wt	0.607	EPA 8151	07/01/09
MCPA	<60.7	mg/Kg dry wt	60.7	EPA 8151	07/01/09
MCP	<60.7	mg/Kg dry wt	60.7	EPA 8151	07/01/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	72	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
4,4'-DDE	61	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
4,4'-DDT	<33	μ g/Kg dry wt	33	EPA 8081A	06/18/09
Aldrin	24	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Alpha-BHC	<1.9	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Alpha-Chlordane	21	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Beta-BHC	<1.9	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Delta-BHC	<2.9	μ g/Kg dry wt	2.9	EPA 8081A	06/18/09
Dieldrin	24	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Endosulfan I	9.1	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Endosulfan II	<5.6	μ g/Kg dry wt	5.6	EPA 8081A	06/18/09
Endosulfan Sulfate	EST 2.4	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09
Endrin	<1.9	μ g/Kg dry wt	1.9	EPA 8081A	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095695

Sample Collected: 06/10/09 13:15
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-ATT466-0609
4033 NW YEON AVE / 48 INCH LINE DS OF MH
Sample Point Code: 18_ST4
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 3

System ID: AN06042
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Extraction holding time was exceeded for Herbicide analysis; results may be low estimates. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: The reporting limit for PCB Aroclor 1248 is raised due non-target interfering compounds, possibly organochlorine pesticides.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Endrin Aldehyde	<1.9	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Endrin Ketone	EST 12	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Gamma-BHC(Lindane)	EST 12	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Gamma-Chlordane	29	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Heptachlor	26	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Heptachlor Epoxide	<1.9	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Methoxychlor	<1.9	µg/Kg dry wt	1.9	EPA 8081A	06/18/09
Toxaphene	<470	µg/Kg dry wt	470	EPA 8081A	06/18/09

POLYNUCLEAR AROMATICS & PHTHALATES - TA

Acenaphthene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Acenaphthylene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Anthracene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Benzo(a)anthracene	429	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Benzo(a)pyrene	390	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Benzo(b)fluoranthene	393	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Benzo(ghi)perylene	372	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Benzo(k)fluoranthene	372	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Bis(2-ethylhexyl) phthalate	7430	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Butyl benzyl phthalate	<2030	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Chrysene	568	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Dibenzo(a,h)anthracene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Diethyl phthalate	<2030	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Dimethyl phthalate	<2030	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Di-n-butyl phthalate	<2030	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Di-n-octyl phthalate	<2030	µg/Kg dry wt	2030	EPA8270M-SIM	06/17/09
Fluoranthene	1070	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Fluorene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Indeno(1,2,3-cd)pyrene	295	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Naphthalene	<203	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Phenanthrene	611	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09
Pyrene	781	µg/Kg dry wt	203	EPA8270M-SIM	06/17/09

End of Report for Sample ID: FO095695

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095696

Sample Collected: 06/10/09 15:55
Sample Received: 06/11/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAX261-0609
3250 NW ST HELENS RD / 36 INCH LINE
Sample Point Code: 18_ST5
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 3

System ID: AN06043
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: Analysis for PCB Aroclors detected numerous non-target interfering compounds, possibly organochlorine pesticides. The reporting limit for Aroclor 1248 is raised due to interferences specifically in the retention time range of 1248.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	59.7	% W/W	0.01	SM 2540 G	06/11/09
METALS					
ARSENIC	3.54	mg/Kg dry wt	0.50	EPA 6020	06/17/09
CADMIUM	24.9	mg/Kg dry wt	0.10	EPA 6020	06/17/09
CHROMIUM	142	mg/Kg dry wt	0.50	EPA 6020	06/17/09
COPPER	192	mg/Kg dry wt	0.25	EPA 6020	06/17/09
LEAD	285	mg/Kg dry wt	0.10	EPA 6020	06/17/09
MANGANESE	367	mg/Kg dry wt	0.5	EPA 6010	06/17/09
MERCURY	0.299	mg/Kg dry wt	0.010	EPA 6020	06/17/09
NICKEL	73.3	mg/Kg dry wt	0.25	EPA 6020	06/17/09
SILVER	1.60	mg/Kg dry wt	0.10	EPA 6020	06/17/09
ZINC	897	mg/Kg dry wt	0.50	EPA 6020	06/17/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1248	<100	µg/Kg dry wt	100	EPA 8082	06/24/09
Aroclor 1254	70	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1260	37	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	90600	mg/Kg dry wt	100	EPA 9060 MOD	06/29/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	45	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
4,4'-DDE	68	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
4,4'-DDT	EST 95	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Aldrin	<29	µg/Kg dry wt	29	EPA 8081A	06/18/09
Alpha-BHC	<8.9	µg/Kg dry wt	8.9	EPA 8081A	06/18/09
Alpha-Chlordane	<23	µg/Kg dry wt	23	EPA 8081A	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095696**

Sample Collected: 06/10/09 15:55
Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAX261-0609
3250 NW ST HELENS RD / 36 INCH LINE
Sample Point Code: 18_ST5
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 2 of 3

System ID: AN06043
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: Analysis for PCB Aroclors detected numerous non-target interfering compounds, possibly organochlorine pesticides. The reporting limit for Aroclor 1248 is raised due to interferences specifically in the retention time range of 1248.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Beta-BHC	<23	µg/Kg dry wt	23	EPA 8081A	06/18/09
Delta-BHC	<3.7	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Dieldrin	<13	µg/Kg dry wt	13	EPA 8081A	06/18/09
Endosulfan I	8.4	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Endosulfan II	<20	µg/Kg dry wt	20	EPA 8081A	06/18/09
Endosulfan Sulfate	EST 4.0	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Endrin	<3.7	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Endrin Aldehyde	<3.7	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Endrin Ketone	<3.7	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Gamma-BHC(Lindane)	<12	µg/Kg dry wt	12	EPA 8081A	06/18/09
Gamma-Chlordane	<25	µg/Kg dry wt	25	EPA 8081A	06/18/09
Heptachlor	EST 12	µg/Kg dry wt	3.7	EPA 8081A	06/18/09
Heptachlor Epoxide	<8.6	µg/Kg dry wt	8.6	EPA 8081A	06/18/09
Methoxychlor	<4.0	µg/Kg dry wt	4.0	EPA 8081A	06/18/09
Toxaphene	<970	µg/Kg dry wt	970	EPA 8081A	06/18/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Acenaphthylene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Anthracene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Benzo(a)anthracene	267	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Benzo(a)pyrene	284	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Benzo(b)fluoranthene	360	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Benzo(ghi)perylene	451	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Benzo(k)fluoranthene	257	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Bis(2-ethylhexyl) phthalate	27700	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Butyl benzyl phthalate	<2230	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Chrysene	706	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Dibenzo(a,h)anthracene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Diethyl phthalate	<2230	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Dimethyl phthalate	<2230	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Di-n-butyl phthalate	<2230	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Di-n-octyl phthalate	<2230	µg/Kg dry wt	2230	EPA8270M-SIM	06/17/09
Fluoranthene	934	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095696**

Sample Collected: 06/10/09 15:55
Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-18-AAX261-0609
3250 NW ST HELENS RD / 36 INCH LINE
Sample Point Code: 18_ST5
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 3

System ID: AN06043
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML

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. For pesticide results flagged as estimates, results from the primary and verification columns varied by more than 40%. LAB: Analysis for PCB Aroclors detected numerous non-target interfering compounds, possibly organochlorine pesticides. The reporting limit for Aroclor 1248 is raised due to interferences specifically in the retention time range of 1248.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Fluorene	<447	µg/Kg dry wt	447	EPA8270M-SIM	06/17/09
Indeno(1,2,3-cd)pyrene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Naphthalene	<223	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Phenanthrene	1250	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09
Pyrene	1210	µg/Kg dry wt	223	EPA8270M-SIM	06/17/09

End of Report for Sample ID: FO095696



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Water Pollution Control Laboratory
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LABORATORY ANALYSIS REPORT

Sample ID: **FO095697**

Sample Collected: 06/09/09 00:00

Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: FIELD DUPLICATE

Report Page: Page 1 of 3

Sample Point Code: DUP
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN06044
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
METALS					
ARSENIC	2.06	mg/Kg dry wt	0.50	EPA 6020	06/17/09
CADMIUM	0.21	mg/Kg dry wt	0.10	EPA 6020	06/17/09
CHROMIUM	24.9	mg/Kg dry wt	0.50	EPA 6020	06/17/09
COPPER	14.6	mg/Kg dry wt	0.25	EPA 6020	06/17/09
LEAD	12.1	mg/Kg dry wt	0.10	EPA 6020	06/17/09
MANGANESE	874	mg/Kg dry wt	0.5	EPA 6010	06/17/09
MERCURY	0.031	mg/Kg dry wt	0.010	EPA 6020	06/17/09
NICKEL	13.4	mg/Kg dry wt	0.25	EPA 6020	06/17/09
SILVER	<0.10	mg/Kg dry wt	0.10	EPA 6020	06/17/09
ZINC	75.0	mg/Kg dry wt	0.50	EPA 6020	06/17/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/24/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1260	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/24/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	19800	mg/Kg dry wt	100	EPA 9060 MOD	06/29/09
GRAIN SIZE BY ASTM - ARI					
Clay (<3.2 µm)	8.5	Fract %	0.1	ASTM D421/422	06/18/09
Coarse Sand (4750-2000 µm)	3.0	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (150-75 µm)	13.5	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (250-150 µm)	5.8	Fract %	0.1	ASTM D421/422	06/18/09
Fine Sand (425-250 µm)	4.3	Fract %	0.1	ASTM D421/422	06/18/09
Gravel (>4750 µm)	1.1	Fract %	0.1	ASTM D421/422	06/18/09
Medium Sand (2000-850 µm)	4.1	Fract %	0.1	ASTM D421/422	06/18/09
Medium Sand (850-425 µm)	3.3	Fract %	0.1	ASTM D421/422	06/18/09
Silt (13-9 µm)	0.7	Fract %	0.1	ASTM D421/422	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095697**

Sample Collected: 06/09/09 00:00
Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: FIELD DUPLICATE

Report Page: Page 2 of 3

Sample Point Code: DUP
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN06044
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJML

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Silt (22-13 μ m)	5.0	Fract %	0.1	ASTM D421/422	06/18/09
Silt (32-22 μ m)	7.1	Fract %	0.1	ASTM D421/422	06/18/09
Silt (7-3.2 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/18/09
Silt (75-32 μ m)	42.2	Fract %	0.1	ASTM D421/422	06/18/09
Silt (9-7 μ m)	1.4	Fract %	0.1	ASTM D421/422	06/18/09
HERBICIDES-CHLORINATED - TA					
2,4,5-T	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4,5-TP (Silvex)	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4-D	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
2,4-DB	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dalapon	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dicamba	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dichlorprop	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
Dinoseb	<0.142	mg/Kg dry wt	0.142	EPA 8151	07/01/09
MCPA	<14.2	mg/Kg dry wt	14.2	EPA 8151	07/01/09
MCPP	<14.2	mg/Kg dry wt	14.2	EPA 8151	07/01/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
4,4'-DDE	1.3	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
4,4'-DDT	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Aldrin	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Alpha-BHC	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Alpha-Chlordane	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Beta-BHC	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Delta-BHC	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Dieldrin	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endosulfan I	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endosulfan II	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endosulfan Sulfate	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endrin	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endrin Aldehyde	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Endrin Ketone	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Gamma-BHC(Lindane)	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09
Gamma-Chlordane	<1.2	μ g/Kg dry wt	1.2	EPA 8081A	06/18/09

Report Date: 08/07/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095697**

Sample Collected: 06/09/09 00:00

Sample Received: 06/11/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: FIELD DUPLICATE

Report Page: Page 3 of 3

Sample Point Code: DUP
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN06044
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB/PTB/AJA/JJM/L

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. Sample extraction holding time was exceeded for Herbicide analysis; results may be low estimates due to compound degradation.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Heptachlor	<1.2	µg/Kg dry wt	1.2	EPA 8081A	06/18/09
Heptachlor Epoxide	<1.2	µg/Kg dry wt	1.2	EPA 8081A	06/18/09
Methoxychlor	<1.2	µg/Kg dry wt	1.2	EPA 8081A	06/18/09
Toxaphene	<58	µg/Kg dry wt	58	EPA 8081A	06/18/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Acenaphthylene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Anthracene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Benzo(a)anthracene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Benzo(a)pyrene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Benzo(b)fluoranthene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Benzo(ghi)perylene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Benzo(k)fluoranthene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Bis(2-ethylhexyl) phthalate	211	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Butyl benzyl phthalate	48.1	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Chrysene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Dibenzo(a,h)anthracene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Diethyl phthalate	<47.0	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Dimethyl phthalate	<47.0	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Di-n-butyl phthalate	<47.0	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Di-n-octyl phthalate	<47.0	µg/Kg dry wt	47.0	EPA8270M-SIM	06/17/09
Fluoranthene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Fluorene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Indeno(1,2,3-cd)pyrene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Naphthalene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Phenanthrene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09
Pyrene	<23.5	µg/Kg dry wt	23.5	EPA8270M-SIM	06/17/09

End of Report for Sample ID: FO095697

Report Date: 08/07/09

Validated By: 

2009 Inline Solids



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Laboratory Data QA/QC Review Upland Source Control Investigation Outfall Basin 18

To: File
From: Julia Fowler, GSI
Date: July 29, 2009

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during source control sampling and analyses conducted by the City of Portland (City) in June 2009 in Outfall Basin 18. An additional sample was collected from Outfall Basin 17; the QA/QC review for this sample will be submitted separately.

The laboratory analysis of the Outfall Basin 18 inline grab solids sample (FO095671) and the associated field decontamination blank (FO095673) was conducted by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and subcontracted laboratories. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Solids – SM 2540 G
 - Metals – EPA 6010/6020
 - Polychlorinated Biphenyl (PCB) Aroclors – EPA 8082
- Test America (TA)
 - Total Organic Carbon (TOC) – EPA 9060 MOD
 - Polynuclear Aromatic Hydrocarbons (PAHs) – EPA 8270M-SIM
 - Phthalates – EPA 8270-SIM
 - PCBs – EPA 8082
 - Chlorinated Herbicides – EPA 8151A Modified
- Analytical Resources, Inc. (ARI)
 - Grain Size Distribution – ASTM D421/422

- Columbia Analytical Services (CAS)
 - Organochlorine Pesticides – EPA 8081
 - Semi-Volatile Organic Compounds – EPA 8270C

The WPCL summary report comments that 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 following QA/QC review of the analytical data is based upon the available documentation supplied from each subcontracted laboratory and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report, if available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate results within laboratory control limits
- Laboratory control sample and duplicate laboratory control sample recoveries within laboratory control limits

The results of the QA/QC review of the subcontracted laboratory reports are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the sample. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The sample was extracted and analyzed within the required method-specific holding times.

Method Blanks

Method blanks were processed during the subcontracted laboratory analyses of chlorinated herbicides, organochlorine pesticides, SVOCs, PCB Aroclors, PAHs, phthalates, and TOC. Two herbicides (2,4-D and 2,4,5-T) were detected in the laboratory method blank, at concentrations less than the method reporting limit (MRL). 2,4-D was detected in sample FO095671 at a concentration less than 10 times the method blank detection. 2,4,5-T was detected at concentration less than the method blank concentration. These data are reported as undetected at the method reporting limit. No detections occurred in the method blanks for the other analyses.

Surrogate Recoveries

Surrogate recoveries were completed during the subcontracted laboratory analysis of organochlorine pesticides, chlorinated herbicides, PCB Aroclors, PAHs, phthalates, and SVOCs. All surrogate recoveries were within laboratory control limits, with one exception. The surrogate recovery control criteria were exceeded for analysis of chlorinated herbicides. The TA laboratory report indicates that although the calibration verification recovery was above the method control limit for this analyte, the data are not impacted because the analyte was not detected in the samples.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were processed during the subcontracted laboratory analyses of chlorinated herbicides, SVOCs, PAHs, and phthalates. Laboratory control criteria for MS/MSD samples were exceeded for several compounds during the chlorinated herbicide analyses. One of these compounds (2,4,5-T) was detected in the sample; the remaining herbicides were not detected. With regard to the 2,4,5-T detection, the data are shown on the data tables as not detected because of laboratory method blank detection (see above).

Laboratory Control / Duplicate Laboratory Control Samples

Laboratory control/duplicate laboratory control samples (LCS/DLCS) were processed during the laboratory analysis of organochlorine pesticides, SVOCs, and PAHs. An LCS sample was processed during the laboratory analysis of chlorinated herbicides, PCBs, phthalates, and TOC. All laboratory control sample recoveries and/or relative percent differences (RPD) were within laboratory control limits, with the following exceptions:

- Recovery of two phthalates (bis[2-ethylhexyl]phthalate and butylbenzyl phthalate) was above acceptance limits. TA reports that because these analytes were not detected in the associated field samples the data are not impacted.
- Recovery of benzoic acid in the LCS/DLCS for the SVOC analysis exceeded the advisory criterion, but CAS reports that this recovery information is for advisory purposes only and no further corrective action was required.
- The upper control criterion for hexachlorocyclopentadiene was exceeded in the LCS/DLCS for the SVOC analysis. The analyte was not detected in the associated field samples.

Other

The method detection limit (MDL) for pesticides analysis was elevated for certain analytes due to the presence of non-target background compounds in the samples. The results are flagged "i" in the CAS report to indicate the matrix interference.

CAS performed calibration verification for analysis of organochlorine pesticides in accordance with EPA Method 8081. CAS reports that the primary evaluation criterion was exceeded for a few analytes in Continuing Calibration Verification during pesticides analysis of the field decontamination blank; in response, an alternative evaluation was performed as specified in EPA 8081, and all evaluation criteria were met.



City of Portland
Chain-of-Custody
Bureau of Environmental Services



Date: 6/4/09
Page: 1 of 1
Collected By: MJS, AJA

Project Name: PORTLAND HARBOR INLINE SAMP

File Number: 1020.001

Matrix: SEDIMENT & DWTR

Requested Analyses

OUTFALL 18 #17

6/4/09

WPCL Sample I.D.

Location

Point Code Sample Date Sample Time Sample Type

FO095671

FO095672

IL-18-AXX261-0609
3250 NW ST HELENS RD
IL-18-AXX298-0609
3136 NW 35th Ave

18_10 6/4/09 1145 C
17_13 6/4/09 1252 C
18_11 6/4/09 1252 C

changes made by PHA-6/9/09

FO095673

FIELD DECON BLANK

FD BLANK 6/4/2009 1128 G

Organics

General

Metals

Field Comments

PCB Aroclors - LL

PAH+Phthalates by TA

Pesticides by CAS

SVOCs by CAS

Herbicides by TA

Total Solids

TOC

Grain Size

Total Metals (Al, Sb, As, Ba, Cd, Cr, Cu, Hg, Mn, Pb, Ni, Se, Ag, Zn)

Signature: Matt Sullivan

Time: 1505

Printed Name: Matt Sullivan

Date: 6/4/09

Received By: 1

Time: 1505

Signature: Matt Sullivan

Date: 6/4/09

Printed Name: Matt Sullivan

Date: 6/4/09

Relinquished By: 2

Signature:

Time:

Printed Name:

Date:

Received By: 2

Signature:

Time:

Printed Name:

Date:

Relinquished By: 3

Signature:

Time:

Printed Name:

Date:

Received By: 3

Signature:

Time:

Printed Name:

Date:

Relinquished By: 4

Signature:

Time:

Printed Name:

Date:

Received By: 4

Signature:

Time:

Printed Name:

Date:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095671

Sample Collected: 06/04/09 11:45
Sample Received: 06/04/09

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-18-AAX261-0609
3250 NW ST HELENS RD
Sample Point Code: 18_10
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 5

System ID: AN05829
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	63.5	% W/W	0.01	SM 2540 G	06/04/09
METALS					
ALUMINUM	12200	mg/Kg dry wt	2.5	EPA 6010	06/12/09
ANTIMONY	0.16	mg/Kg dry wt	0.10	EPA 6020	06/10/09
ARSENIC	2.14	mg/Kg dry wt	0.50	EPA 6020	06/10/09
BARIUM	91.5	mg/Kg dry wt	0.10	EPA 6020	06/10/09
CADMIUM	0.17	mg/Kg dry wt	0.10	EPA 6020	06/10/09
CHROMIUM	17.6	mg/Kg dry wt	0.50	EPA 6020	06/10/09
COPPER	16.5	mg/Kg dry wt	0.25	EPA 6020	06/10/09
LEAD	6.11	mg/Kg dry wt	0.10	EPA 6020	06/10/09
MANGANESE	347	mg/Kg dry wt	0.5	EPA 6010	06/12/09
MERCURY	0.018	mg/Kg dry wt	0.010	EPA 6020	06/10/09
NICKEL	19.2	mg/Kg dry wt	0.25	EPA 6020	06/10/09
SELENIUM	<1.00	mg/Kg dry wt	1.0	EPA 6020	06/10/09
SILVER	<0.10	mg/Kg dry wt	0.10	EPA 6020	06/10/09
ZINC	58.9	mg/Kg dry wt	0.50	EPA 6020	06/10/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/05/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1260	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	786	mg/Kg dry wt	100	EPA 9060 MOD	06/18/09
GRAIN SIZE BY ASTM - ARI					
Clay (<3.2 µm)	4.6	Fract %	0.1	ASTM D421/422	06/09/09
Coarse Sand (4750-2000 µm)	1.4	Fract %	0.1	ASTM D421/422	06/09/09
Fine Sand (150-75 µm)	4.7	Fract %	0.1	ASTM D421/422	06/09/09
Fine Sand (250-150 µm)	17.3	Fract %	0.1	ASTM D421/422	06/09/09

Report Date: 07/08/09

Validated By:



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LABORATORY ANALYSIS REPORT

Sample ID: FO095671

Sample Collected: 06/04/09 11:45

**Sample Status: COMPLETE AND
VALIDATED**

Sample Received: 06/04/09

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 2 of 5

Address/Location: IL-18-AAX261-0609

3250 NW ST HELENS RD

System ID: AN05829

Sample Point Code: 18_10

EID File #: 1020.001

Sample Type: COMPOSITE

LocCode: PORTHARI

Sample Matrix: SEDIMENT

Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Fine Sand (425-250 μ m)	39.7	Fract %	0.1	ASTM D421/422	06/09/09
Gravel (>4750 μ m)	6.2	Fract %	0.1	ASTM D421/422	06/09/09
Medium Sand (2000-850 μ m)	2.2	Fract %	0.1	ASTM D421/422	06/09/09
Medium Sand (850-425 μ m)	19.1	Fract %	0.1	ASTM D421/422	06/09/09
Silt (13-9 μ m)	0.8	Fract %	0.1	ASTM D421/422	06/09/09
Silt (22-13 μ m)	0.8	Fract %	0.1	ASTM D421/422	06/09/09
Silt (32-22 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/09/09
Silt (7-3.2 μ m)	1.3	Fract %	0.1	ASTM D421/422	06/09/09
Silt (75-32 μ m)	1.9	Fract %	0.1	ASTM D421/422	06/09/09
Silt (9-7 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/09/09
HERBICIDES-CHLORINATED - TA					
2,4,5-T	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
2,4,5-TP (Silvex)	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
2,4-D	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
2,4-DB	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
Dalapon	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
Dicamba	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
Dichlorprop	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
Dinoseb	<0.0313	mg/Kg dry wt	0.0313	EPA 8151	06/18/09
MCPA	<3.130	mg/Kg dry wt	3.130	EPA 8151	06/18/09
MCPP	<3.130	mg/Kg dry wt	3.130	EPA 8151	06/18/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
4,4'-DDE	0.97	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
4,4'-DDT	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Aldrin	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Alpha-BHC	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Alpha-Chlordane	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Beta-BHC	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Delta-BHC	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Dieldrin	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Endosulfan I	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Endosulfan II	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Endosulfan Sulfate	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09
Endrin	<0.79	μ g/Kg dry wt	0.79	EPA 8081A	06/09/09

Report Date: 07/08/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095671

Sample Collected: 06/04/09 11:45
Sample Received: 06/04/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-18-AAX261-0609
3250 NW ST HELENS RD
Sample Point Code: 18_10
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 5

System ID: AN05829
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Endrin Aldehyde	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Endrin Ketone	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Gamma-BHC(Lindane)	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Gamma-Chlordane	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Heptachlor	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Heptachlor Epoxide	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Methoxychlor	<0.79	µg/Kg dry wt	0.79	EPA 8081A	06/09/09
Toxaphene	<40	µg/Kg dry wt	40	EPA 8081A	06/09/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Acenaphthylene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Anthracene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Benzo(a)anthracene	31.3	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Benzo(a)pyrene	23.7	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Benzo(b)fluoranthene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Benzo(ghi)perylene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Benzo(k)fluoranthene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Bis(2-ethylhexyl) phthalate	68.9	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Butyl benzyl phthalate	<41.7	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Chrysene	35.3	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Dibenzo(a,h)anthracene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Diethyl phthalate	<41.7	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Dimethyl phthalate	<41.7	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Di-n-butyl phthalate	<41.7	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Di-n-octyl phthalate	<41.7	µg/Kg dry wt	41.7	EPA8270M-SIM	06/09/09
Fluoranthene	49.7	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Fluorene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Indeno(1,2,3-cd)pyrene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Naphthalene	<20.8	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Phenanthrene	71.9	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
Pyrene	55.4	µg/Kg dry wt	20.8	EPA8270M-SIM	06/09/09
SEMI-VOLATILE ORGANICS - CAS					
1,2,4-Trichlorobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
1,2-Dichlorobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
1,3-Dichlorobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09

Report Date: 07/08/09

Validated By:



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LABORATORY ANALYSIS REPORT

Sample ID: **FO095671**

Sample Collected: 06/04/09 11:45

Sample Received: 06/04/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 4 of 5

Address/Location: IL-18-AAX261-0609
3250 NW ST HELENS RD

System ID: AN05829

Sample Point Code: 18_10

EID File #: 1020.001

Sample Type: COMPOSITE

LocCode: PORTHARI

Sample Matrix: SEDIMENT

Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
1,4-Dichlorobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2,4,5-Trichlorophenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2,4,6-Trichlorophenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2,4-Dichlorophenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2,4-Dimethylphenol	<40	µg/Kg dry wt	40	EPA 8270 LV	06/08/09
2,4-Dinitrophenol	<160	µg/Kg dry wt	160	EPA 8270 LV	06/08/09
2,4-Dinitrotoluene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2,6-Dinitrotoluene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2-Chloronaphthalene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2-Chlorophenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2-Methylnaphthalene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2-Methylphenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
2-Nitroaniline	<16	µg/Kg dry wt	16	EPA 8270 LV	06/08/09
2-Nitrophenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
3,3'-Dichlorobenzidine	<79	µg/Kg dry wt	79	EPA 8270 LV	06/08/09
3-Nitroaniline	<16	µg/Kg dry wt	16	EPA 8270 LV	06/08/09
4,6-Dinitro-2-methylphenol	<79	µg/Kg dry wt	79	EPA 8270 LV	06/08/09
4-Bromophenylphenyl ether	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
4-Chloro-3-methylphenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
4-Chloroaniline	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
4-Chlorophenylphenyl ether	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
4-Methylphenol	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
4-Nitroaniline	<16	µg/Kg dry wt	16	EPA 8270 LV	06/08/09
4-Nitrophenol	<79	µg/Kg dry wt	79	EPA 8270 LV	06/08/09
Acenaphthene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Acenaphthylene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Anthracene	8.8	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzo(a)anthracene	27	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzo(a)pyrene	26	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzo(b)fluoranthene	27	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzo(g,h,i)perylene	17	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzo(k)fluoranthene	11	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Benzoic acid	<160	µg/Kg dry wt	160	EPA 8270 LV	06/08/09
Benzyl alcohol	<16	µg/Kg dry wt	16	EPA 8270 LV	06/08/09
Bis(2-chloroethoxy) methane	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Bis(2-chloroethyl) ether	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09

Report Date: 07/08/09

Validated By:



LABORATORY ANALYSIS REPORT

Sample ID: **FO095671**

Sample Collected: 06/04/09 11:45
Sample Received: 06/04/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-18-AAX261-0609
3250 NW ST HELENS RD
Sample Point Code: 18_10
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 5 of 5

System ID: AN05829
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Bis(2-chloroisopropyl) ether	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Bis(2-ethylhexyl) phthalate	<79	µg/Kg dry wt	79	EPA 8270 LV	06/08/09
Butyl benzyl phthalate	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Chrysene	31	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Dibenzo(a,h)anthracene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Dibenzofuran	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Diethyl phthalate	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Dimethyl phthalate	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Di-n-butyl phthalate	<16	µg/Kg dry wt	16	EPA 8270 LV	06/08/09
Di-n-octyl phthalate	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Fluoranthene	46	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Fluorene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Hexachlorobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Hexachlorobutadiene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Hexachlorocyclopentadiene	<40	µg/Kg dry wt	40	EPA 8270 LV	06/08/09
Hexachloroethane	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Indeno(1,2,3-cd)pyrene	15	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Isophorone	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Naphthalene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Nitrobenzene	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
N-Nitrosodi-n-propylamine	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
N-Nitrosodiphenylamine	<7.9	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Pentachlorophenol	<79	µg/Kg dry wt	79	EPA 8270 LV	06/08/09
Phenanthrene	23	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09
Phenol	<24	µg/Kg dry wt	24	EPA 8270 LV	06/08/09
Pyrene	52	µg/Kg dry wt	7.9	EPA 8270 LV	06/08/09

End of Report for Sample ID: FO095671



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095672

Sample Collected: 06/04/09 12:52

**Sample Status: COMPLETE AND
VALIDATED**

Sample Received: 06/04/09

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 1 of 5

Address/Location: IL-17-AAX298-0609

3136 NW 35TH AVE

System ID: AN05830

Sample Point Code: 17_13

EID File #: 1020.001

Sample Type: COMPOSITE

LocCode: PORTHARI

Sample Matrix: SEDIMENT

Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	67.7	% W/W	0.01	SM 2540 G	06/04/09
METALS					
ALUMINUM	9760	mg/Kg dry wt	2.5	EPA 6010	06/12/09
ANTIMONY	3.59	mg/Kg dry wt	0.10	EPA 6020	06/10/09
ARSENIC	101	mg/Kg dry wt	0.50	EPA 6020	06/10/09
BARIUM	340	mg/Kg dry wt	0.10	EPA 6020	06/10/09
CADMIUM	0.13	mg/Kg dry wt	0.10	EPA 6020	06/10/09
CHROMIUM	245	mg/Kg dry wt	0.50	EPA 6020	06/10/09
COPPER	37.0	mg/Kg dry wt	0.25	EPA 6020	06/10/09
LEAD	38.2	mg/Kg dry wt	0.10	EPA 6020	06/10/09
MANGANESE	1640	mg/Kg dry wt	0.5	EPA 6010	06/12/09
MERCURY	0.015	mg/Kg dry wt	0.010	EPA 6020	06/10/09
NICKEL	305	mg/Kg dry wt	0.25	EPA 6020	06/10/09
SELENIUM	<1.00	mg/Kg dry wt	1.0	EPA 6020	06/10/09
SILVER	<0.10	mg/Kg dry wt	0.10	EPA 6020	06/10/09
ZINC	153	mg/Kg dry wt	0.50	EPA 6020	06/10/09
GC ANALYSIS					
POLYCHLORINATED BIPHENYLS (PCB)					
Aroclor 1016/1242	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1221	<20	µg/Kg dry wt	20	EPA 8082	06/05/09
Aroclor 1232	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1248	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1254	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1260	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1262	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
Aroclor 1268	<10	µg/Kg dry wt	10	EPA 8082	06/05/09
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	6490	mg/Kg dry wt	100	EPA 9060 MOD	06/18/09
GRAIN SIZE BY ASTM - ARI					
Clay (<3.2 µm)	5.8	Fract %	0.1	ASTM D421/422	06/09/09
Coarse Sand (4750-2000 µm)	1.7	Fract %	0.1	ASTM D421/422	06/09/09
Fine Sand (150-75 µm)	1.4	Fract %	0.1	ASTM D421/422	06/09/09
Fine Sand (250-150 µm)	4.2	Fract %	0.1	ASTM D421/422	06/09/09

Report Date: 07/09/09

Validated By:



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



LABORATORY ANALYSIS REPORT

Sample ID: FO095672

Sample Collected: 06/04/09 12:52
Sample Received: 06/04/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 2 of 5

Address/Location: IL-17-AAX298-0609
3136 NW 35TH AVE

System ID: AN05830

Sample Point Code: 17_13

EID File #: 1020.001

Sample Type: COMPOSITE

LocCode: PORTHARI

Sample Matrix: SEDIMENT

Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Fine Sand (425-250 μ m)	41.1	Fract %	0.1	ASTM D421/422	06/09/09
Gravel (>4750 μ m)	1.1	Fract %	0.1	ASTM D421/422	06/09/09
Medium Sand (2000-850 μ m)	2.6	Fract %	0.1	ASTM D421/422	06/09/09
Medium Sand (850-425 μ m)	38.3	Fract %	0.1	ASTM D421/422	06/09/09
Silt (13-9 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/09/09
Silt (22-13 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/09/09
Silt (32-22 μ m)	0.4	Fract %	0.1	ASTM D421/422	06/09/09
Silt (7-3.2 μ m)	1.3	Fract %	0.1	ASTM D421/422	06/09/09
Silt (75-32 μ m)	2.0	Fract %	0.1	ASTM D421/422	06/09/09
Silt (9-7 μ m)	<0.1	Fract %	0.1	ASTM D421/422	06/09/09
HERBICIDES-CHLORINATED - TA					
2,4,5-T	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
2,4,5-TP (Silvex)	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
2,4-D	1.790	mg/Kg dry wt	0.303	EPA 8151	06/18/09
2,4-DB	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
Dalapon	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
Dicamba	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
Dichlorprop	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
Dinoseb	<0.0303	mg/Kg dry wt	0.0303	EPA 8151	06/18/09
MCPA	<3.030	mg/Kg dry wt	3.030	EPA 8151	06/18/09
MCPP	<3.030	mg/Kg dry wt	3.030	EPA 8151	06/18/09
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
4,4'-DDE	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
4,4'-DDT	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Aldrin	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Alpha-BHC	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Alpha-Chlordane	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Beta-BHC	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Delta-BHC	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Dieldrin	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Endosulfan I	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Endosulfan II	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Endosulfan Sulfate	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09
Endrin	<0.81	μ g/Kg dry wt	0.81	EPA 8081A	06/09/09

Report Date: 07/09/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095672

Sample Collected: 06/04/09 12:52
Sample Received: 06/04/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-17-AAX298-0609
3136 NW 35TH AVE
Sample Point Code: 17_13
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 3 of 5

System ID: AN05830
EID File # : 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Endrin Aldehyde	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Endrin Ketone	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Gamma-BHC(Lindane)	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Gamma-Chlordane	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Heptachlor	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Heptachlor Epoxide	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Methoxychlor	<0.81	µg/Kg dry wt	0.81	EPA 8081A	06/09/09
Toxaphene	<41	µg/Kg dry wt	41	EPA 8081A	06/09/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Acenaphthylene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Anthracene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Benzo(a)anthracene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Benzo(a)pyrene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Benzo(b)fluoranthene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Benzo(ghi)perylene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Benzo(k)fluoranthene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Bis(2-ethylhexyl) phthalate	272	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Butyl benzyl phthalate	<162	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Chrysene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Dibenzo(a,h)anthracene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Diethyl phthalate	<162	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Dimethyl phthalate	<162	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Di-n-butyl phthalate	<162	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Di-n-octyl phthalate	<162	µg/Kg dry wt	162	EPA8270M-SIM	06/09/09
Fluoranthene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Fluorene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Indeno(1,2,3-cd)pyrene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Naphthalene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Phenanthrene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
Pyrene	<20.2	µg/Kg dry wt	20.2	EPA8270M-SIM	06/09/09
SEMI-VOLATILE ORGANICS - CAS					
1,2,4-Trichlorobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
1,2-Dichlorobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
1,3-Dichlorobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09

Report Date: 07/09/09

Validated By:



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Water Pollution Control Laboratory
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LABORATORY ANALYSIS REPORT

Sample ID: FO095672

Sample Collected: 06/04/09 12:52
Sample Received: 06/04/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 4 of 5

Address/Location: IL-17-AAX298-0609
3136 NW 35TH AVE

Sample Point Code: 17_13
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

System ID: AN05830
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
1,4-Dichlorobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2,4,5-Trichlorophenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2,4,6-Trichlorophenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2,4-Dichlorophenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2,4-Dimethylphenol	<50	µg/Kg dry wt	50	EPA 8270 LV	06/18/09
2,4-Dinitrophenol	<200	µg/Kg dry wt	200	EPA 8270 LV	06/18/09
2,4-Dinitrotoluene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2,6-Dinitrotoluene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2-Chloronaphthalene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2-Chlorophenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2-Methylnaphthalene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2-Methylphenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
2-Nitroaniline	<20	µg/Kg dry wt	20	EPA 8270 LV	06/18/09
2-Nitrophenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
3,3'-Dichlorobenzidine	<99	µg/Kg dry wt	99	EPA 8270 LV	06/18/09
3-Nitroaniline	<20	µg/Kg dry wt	20	EPA 8270 LV	06/18/09
4,6-Dinitro-2-methylphenol	<99	µg/Kg dry wt	99	EPA 8270 LV	06/18/09
4-Bromophenylphenyl ether	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
4-Chloro-3-methylphenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
4-Chloroaniline	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
4-Chlorophenylphenyl ether	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
4-Methylphenol	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
4-Nitroaniline	<20	µg/Kg dry wt	20	EPA 8270 LV	06/18/09
4-Nitrophenol	<99	µg/Kg dry wt	99	EPA 8270 LV	06/18/09
Acenaphthene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Acenaphthylene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Anthracene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzo(a)anthracene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzo(a)pyrene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzo(b)fluoranthene	12	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzo(g,h,i)perylene	12	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzo(k)fluoranthene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Benzoic acid	<200	µg/Kg dry wt	200	EPA 8270 LV	06/18/09
Benzyl alcohol	<20	µg/Kg dry wt	20	EPA 8270 LV	06/18/09
Bis(2-chloroethoxy) methane	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Bis(2-chloroethyl) ether	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09

Report Date: 07/09/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095672

Sample Collected: 06/04/09 12:52
Sample Received: 06/04/09

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP

Report Page: Page 5 of 5

Address/Location: IL-17-AAX298-0609
3136 NW 35TH AVE

System ID: AN05830

Sample Point Code: 17_13

EID File #: 1020.001

Sample Type: COMPOSITE

LocCode: PORTHARI

Sample Matrix: SEDIMENT

Collected By: MJS/AJA

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. Inconsistent matrix spike recoveries for Herbicide analysis indicates possible matrix effects.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Bis(2-chloroisopropyl) ether	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Bis(2-ethylhexyl) phthalate	110	µg/Kg dry wt	99	EPA 8270 LV	06/18/09
Butyl benzyl phthalate	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Chrysene	12	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Dibenzo(a,h)anthracene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Dibenzofuran	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Diethyl phthalate	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Dimethyl phthalate	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Di-n-butyl phthalate	<20	µg/Kg dry wt	20	EPA 8270 LV	06/18/09
Di-n-octyl phthalate	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Fluoranthene	17	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Fluorene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Hexachlorobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Hexachlorobutadiene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Hexachlorocyclopentadiene	<50	µg/Kg dry wt	50	EPA 8270 LV	06/18/09
Hexachloroethane	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Indeno(1,2,3-cd)pyrene	11	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Isophorone	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Naphthalene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Nitrobenzene	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
N-Nitrosodi-n-propylamine	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
N-Nitrosodiphenylamine	<9.9	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Pentachlorophenol	<99	µg/Kg dry wt	99	EPA 8270 LV	06/18/09
Phenanthrene	13	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09
Phenol	<30	µg/Kg dry wt	30	EPA 8270 LV	06/18/09
Pyrene	26	µg/Kg dry wt	9.9	EPA 8270 LV	06/18/09

End of Report for Sample ID: FO095672

Report Date: 07/09/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO095673**

Sample Collected: 06/04/09 11:28
Sample Received: 06/04/09

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: FIELD DECON BLANK

Report Page: Page 1 of 3

Sample Point Code: FDBLANK
Sample Type: GRAB
Sample Matrix: DIWTR

System ID: AN05831
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
METALS					
ALUMINUM	<0.050	mg/L	0.050	EPA 200.7	06/05/09
MANGANESE	<0.010	mg/L	0.010	EPA 200.7	06/05/09
MERCURY	<0.0020	µg/L	0.002	WPCLSOP M-10.02	06/05/09
METALS BY ICP-MS (TOTAL) - 11					
ANTIMONY	<0.10	µg/L	0.1	EPA 200.8	06/09/09
ARSENIC	<0.10	µg/L	0.1	EPA 200.8	06/09/09
BARIUM	<0.10	µg/L	0.1	EPA 200.8	06/09/09
CADMIUM	<0.10	µg/L	0.1	EPA 200.8	06/09/09
CHROMIUM	<0.40	µg/L	0.4	EPA 200.8	06/09/09
COPPER	<0.20	µg/L	0.2	EPA 200.8	06/09/09
LEAD	<0.10	µg/L	0.1	EPA 200.8	06/09/09
NICKEL	<0.20	µg/L	0.2	EPA 200.8	06/09/09
SELENIUM	<0.50	µg/L	0.5	EPA 200.8	06/09/09
SILVER	<0.10	µg/L	0.1	EPA 200.8	06/09/09
ZINC	<0.50	µg/L	0.5	EPA 200.8	06/09/09
OUTSIDE ANALYSIS					
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	<1.8	ng/L	1.8	EPA 8081	06/10/09
4,4'-DDE	<1.9	ng/L	1.9	EPA 8081	06/10/09
4,4'-DDT	<0.72	ng/L	0.72	EPA 8081	06/10/09
Aldrin	<0.50	ng/L	0.50	EPA 8081	06/10/09
Alpha-BHC	<0.50	ng/L	0.50	EPA 8081	06/10/09
Alpha-Chlordane	<0.50	ng/L	0.50	EPA 8081	06/10/09
Beta-BHC	<0.50	ng/L	0.50	EPA 8081	06/10/09
Delta-BHC	<0.50	ng/L	0.50	EPA 8081	06/10/09
Dieldrin	<0.50	ng/L	0.50	EPA 8081	06/10/09
Endosulfan I	<0.50	ng/L	0.50	EPA 8081	06/10/09
Endosulfan II	0.96	ng/L	0.50	EPA 8081	06/10/09
Endosulfan Sulfate	<0.50	ng/L	0.50	EPA 8081	06/10/09
Endrin	<0.50	ng/L	0.50	EPA 8081	06/10/09
Endrin Aldehyde	<0.50	ng/L	0.50	EPA 8081	06/10/09
Endrin Ketone	<0.50	ng/L	0.50	EPA 8081	06/10/09
Gamma-BHC(Lindane)	<0.50	ng/L	0.50	EPA 8081	06/10/09
Gamma-Chlordane	<0.50	ng/L	0.50	EPA 8081	06/10/09

Report Date: 07/08/09

Validated By: 



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095673

Sample Collected: 06/04/09 11:28
Sample Received: 06/04/09

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: FIELD DECON BLANK

Report Page: Page 2 of 3

Sample Point Code: FDBLANK
Sample Type: GRAB
Sample Matrix: DIWTR

System ID: AN05831
EID File #: 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Heptachlor	<0.50	ng/L	0.50	EPA 8081	06/10/09
Heptachlor Epoxide	<0.50	ng/L	0.50	EPA 8081	06/10/09
Methoxychlor	<0.50	ng/L	0.50	EPA 8081	06/10/09
Toxaphene	<54	ng/L	54	EPA 8081	06/10/09
POLYCHLORINATED BIPHENYLS (PCB) - TA					
Aroclor 1016	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1221	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1232	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1242	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1248	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1254	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1260	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1262	<0.048	µg/L	0.048	EPA 8082	06/11/09
Aroclor 1268	<0.048	µg/L	0.048	EPA 8082	06/11/09
POLYNUCLEAR AROMATICS & PHTHALATES - TA					
Acenaphthene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Acenaphthylene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Anthracene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Benzo(a)anthracene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Benzo(a)pyrene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Benzo(b)fluoranthene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Benzo(ghi)perylene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Benzo(k)fluoranthene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Bis(2-ethylhexyl) phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Butyl benzyl phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Chrysene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Dibenzo(a,h)anthracene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Diethyl phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Dimethyl phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Di-n-butyl phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Di-n-octyl phthalate	<0.971	µg/L	0.971	EPA 8270M-SIM	06/08/09
Fluoranthene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Fluorene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Indeno(1,2,3-cd)pyrene	<0.00971	µg/L	0.00971	EPA 8270M-SIM	06/08/09
Naphthalene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09

Report Date: 07/08/09

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO095673

Sample Collected: 06/04/09 11:28
Sample Received: 06/04/09

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: FIELD DECON BLANK

Report Page: Page 3 of 3

Sample Point Code: FDBLANK
Sample Type: GRAB
Sample Matrix: DIWTR

System ID: AN05831
EID File # : 1020.001
LocCode: PORTHARI
Collected By: MJS/AJA

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Phenanthrene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09
Pyrene	<0.0194	µg/L	0.0194	EPA 8270M-SIM	06/08/09

End of Report for Sample ID: FO095673

Report Date: 07/08/09

Validated By: 



Analytical Resources, Incorporated
Analytical Chemists and Consultants

June 19, 2009

Mr. Howard Holmes
Test America, Inc.
9405 SW Nimbus Ave.
Beaverton, OR 97008

Subject: Project No.: PSF0201
ARI Project No.: PB87

Dear Mr. Holmes,

The following pages provide the information you requested. Please call me to discuss any questions or comments you may have on the data or its presentation.

Best Regards,
Analytical Resources Incorporated

Guenna Smith
Geotechnical Division Manager
206-695-6246
guennas@arilabs.com

Enclosures

cc: File PB87

SUBCONTRACT ORDER

TestAmerica Portland

PSF0201

SENDING LABORATORY:

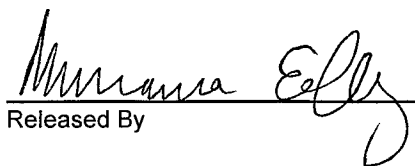
TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Phone: (503) 906-9200
Fax: (503) 906-9210
Project Manager: Howard Holmes

RECEIVING LABORATORY:

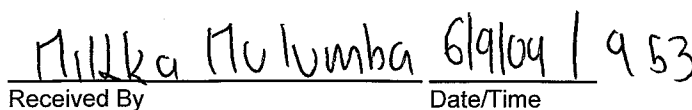
Analytical Resources, Inc. (ARI)
4611 S 134th Place, Suite 100
Tukwilla, WA 98168
Phone: (206) 621-6490
Fax: 206-621-7523
Project Location: OR - OREGON
Receipt Temperature: 14.2 °C

Ice: Y / N

Analysis	Units	Due	Expires	Comments
<hr/>				
Sample ID: PSF0201-01	Soil		Sampled: 06/04/09 11:45	
Grain Size (ASTM) - SUB	ug/l	06/19/09	12/01/09 11:45	sub to Analytical Resources Inc (ARI)
Containers Supplied:				
8 oz. jar (A)				
<hr/>				
Sample ID: PSF0201-02	Soil		Sampled: 06/04/09 12:52	
Grain Size (ASTM) - SUB	ug/l	06/19/09	12/01/09 12:52	sub to Analytical Resources Inc (ARI)
Containers Supplied:				
8 oz. jar (A)				
<hr/>				


Released By

6/8/09 1:40
Date/Time


Received By

6/9/09 1:53
Date/Time

Released By

Date/Time

Received By

Date/Time



Analytical Resources, Incorporated

Analytical Chemists and Consultants

Client: Test America, Inc.

ARI Project No.: PB87

Client Project: PSF0201

Case Narrative

1. Two samples were received on June 9, 2009, and were in good condition.
2. The samples were submitted for grain size distribution, according to ASTM D422. The samples were prepared according to ASTM D421.
3. An assumed specific gravity of 2.65 was used in the calculations.
4. A standard milkshake mixer type device was used to disperse the sample.
5. The data is provided in summary tables and plots.
6. There were no further anomalies in the samples or test method.

Approved by:

Title:

Steven Smith
Lead Technician

Date:

6/19/09

Test America, Inc.
PSF0201

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (150)	#200 (75)	32	22	13	9	7	3.2	1.3
PSF0201-01	100.0	100.0	100.0	100.0	100.0	98.3	97.5	93.8	92.3	90.1	71.0	31.4	14.1	9.4	7.6	7.6	6.7	5.9	5.9	4.6	4.6
PSF0201-02	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.9	97.2	94.6	56.4	15.3	11.1	9.6	7.6	7.2	7.2	7.2	7.2	5.8	4.0

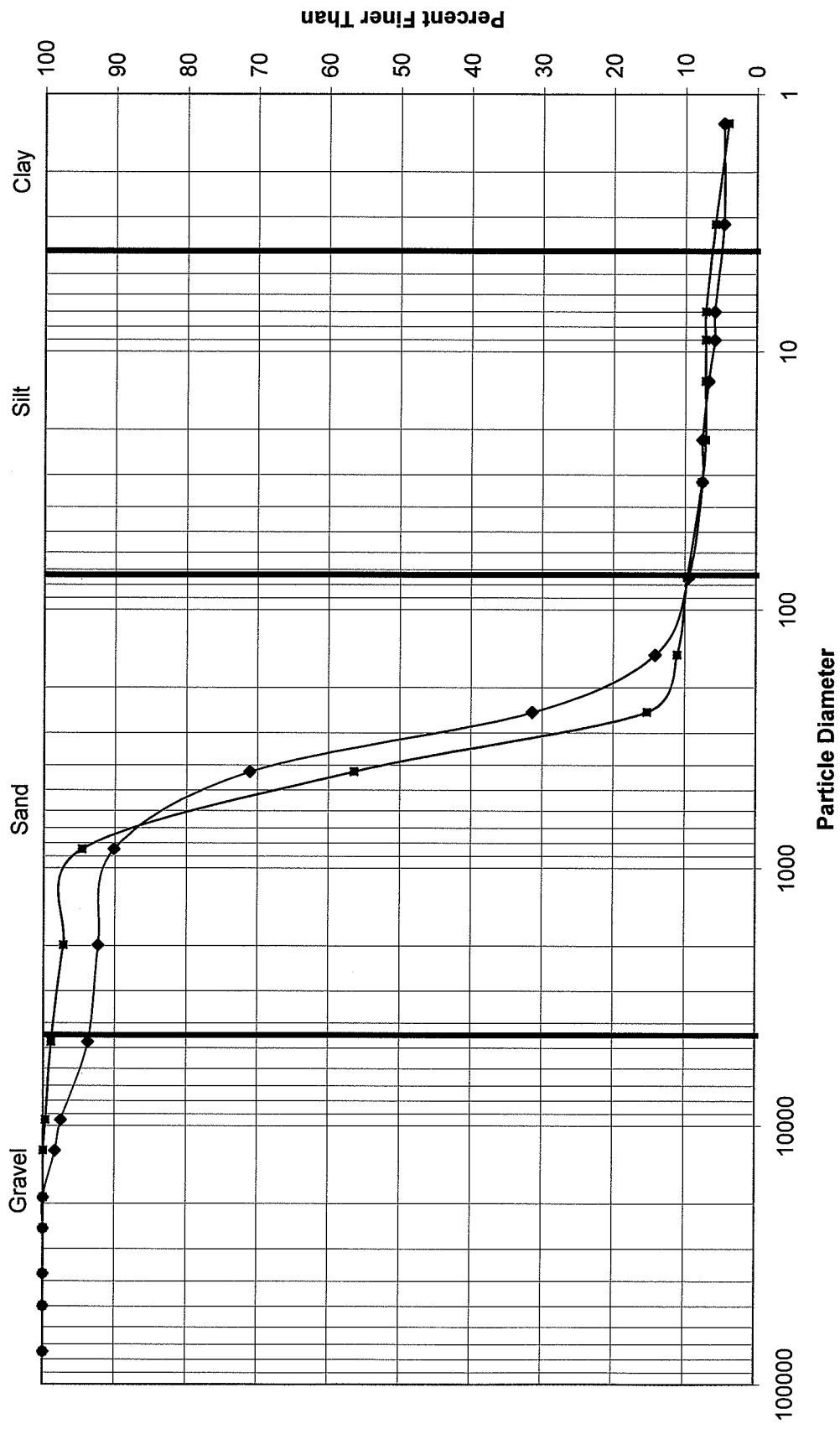
Testing performed according to ASTM D421/D422

Test America, Inc.
PSF0201

Percent Retained in Each Size Fraction

Description	% Coarse Gravel				% Gravel			% Coarse Sand	% Medium Sand			% Fine Sand			% Very Coarse Silt	% Coarse Silt	% Medium Silt	% Fine Silt	% Very Fine Silt	% Clay
	3-2"	2-1 1/2"	1 1/2"-1"	1-3/4"	3/4-1/2"	1/2-3/8"	3/8"-4/750		4750-2000	2000-850	850-425	425-250	250-150	150-75						
Particle Size (microns)																				
PSF0201-01	0.0	0.0	0.0	0.0	1.7	0.8	3.7	1.4	2.2	19.1	39.7	17.3	4.7	1.9	0.0	0.0	0.8	0.0	1.3	4.6
PSF0201-02	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.7	2.6	38.3	41.1	4.2	1.4	2.0	0.4	0.0	0.0	0.0	1.3	5.8

Grain Size Distribution by Hydrometer



June 30, 2009

Analytical Report for Service Request No: K0905065

Jennifer Shackelford
Portland, City of
1120 SW Fifth Avenue # 1000
Portland, OR 97204

RE: Portland Harbor Inline Samp

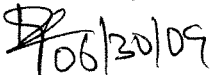
Dear Jennifer:

Enclosed are the results of the samples submitted to our laboratory on June 05, 2009. For your reference, these analyses have been assigned our service request number K0905065.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at PDivvela@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Pradeep Divvela
Project Chemist

PD/ln

Page 1 of 46

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge/Water

Service Request No.: K0905065
Date Received: 06/05/09

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Two sludge and four water samples were received for analysis at Columbia Analytical Services on 06/05/09. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Organochlorine Pesticides by EPA Method 8081A for Sediments

Elevated Detection Limits:

The detection limit was elevated for at least a couple analytes in both field samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Organochlorine Pesticides by EPA Method 8081A for Sludge

Second Source Exceptions:

The analysis of Chlorinated Pesticides by EPA 8081 requires the use of dual column confirmation. When the Initial Calibration Verification (ICV) criteria are met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for 2,4'-DDT in CAL 8582. The ICV results were reported from the acceptable column. The data quality was not affected. No further corrective action was necessary.

Calibration Verification Exceptions:

The primary evaluation criterion was exceeded for a few analytes in Continuing Calibration Verification (CCV) 0615F032. In accordance with CAS standard operating procedures, the alternative evaluation specified in the EPA method was performed using the average percent recovery of all analytes in the verification standard. The standard met the alternative evaluation criteria.

Sample Confirmation Notes:

The confirmation comparison criteria of 40% difference for Endosulfan II was exceeded in sample FO 095675. The higher of the two values was reported because no evidence of a matrix interference was observed.

Approved by  Date 

Elevated Detection Limits:

The MDL/MRL is elevated for several analytes in sample Method Blank KWG0905002-13. The chromatogram indicated the presence of non-target background components, which were apparently introduced as laboratory artifacts. The contamination prevented adequate resolution of the target compounds at the MDL. Note the level of background was relatively low compared to the MDL, so the affect on the results was minimal. The results are flagged to indicate the problem.

The detection limit was elevated for at least a couple analytes in all field samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

No other anomalies associated with the analysis of these samples were observed.

Semivolatile Organic Compounds by EPA Method 8270C**Surrogate Exceptions:**

The control criteria were exceeded for 2-Fluorophenol and Phenol-d6 in FO095672. Since the problem may indicate a potential bias in the analytical results, the sample was re-extracted within hold time and re-analyzed. The surrogates met control criteria for the re-analysis. Therefore, the results from the re-extracted analysis were reported.

Lab Control Sample Exceptions:

The advisory criterion was exceeded for Benzoic Acid in the replicate Laboratory Control Samples (LCS/DLCS) KWG0904879-3 and KWG0904879-4. As per the CAS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

The upper control criterion was exceeded for Hexachlorocyclopentadiene in the replicate Laboratory Control Samples (LCS/DLCS) KWG0905322-1 and KWG0905322-2. The analyte in question was not detected in the associated field sample. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

Approved by  Date 

Chain of Custody Documentation



CHAIN OF CUSTODY

SR#: 10000000

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222x07 • FAX (360) 636-1068

PAGE 1 OF 1 COC #

PROJECT NAME: <u>Portland Harbor Inland Soap</u>		PROJECT NUMBER: _____	
PROJECT MANAGER: <u>Tennister Shackelford</u>		COMPANY/ADDRESS: <u>City of Portland</u>	
CITY/STATE/ZIP: _____		E-MAIL ADDRESS: _____	
PHONE #: _____		FAX #: _____	
SAMPLER'S SIGNATURE: _____		DATE: _____	
SAMPLE I.D.	TIME	LAB I.D.	MATRIX
F0095671	1145		sed
F0095672	1252		sed
F0095673	1128		w
F0095674	1420		w
F0095675	0856		w
F0095676	0942		w
NUMBER OF CONTAINERS			
Semi-volatile Organics by GC/MS 625 <input type="checkbox"/> 8270 <input type="checkbox"/> 8270LL <input checked="" type="checkbox"/>			
Volatile Organics 624 <input type="checkbox"/> 8260 <input type="checkbox"/>			
Hydrocarbons (*see below) Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Oil <input type="checkbox"/>			
Fuel Fingerprint (FIO) Oil & Grease/TPH <input type="checkbox"/> 1664 HEM <input type="checkbox"/>			
PCBs Aroclors <input type="checkbox"/> Congeners <input type="checkbox"/>			
Pesticides/Herbicides - Low Level 608 <input type="checkbox"/> 8081A <input checked="" type="checkbox"/> 814A <input checked="" type="checkbox"/> 8151M <input type="checkbox"/>			
Chlorophenolics - 8151M Tri <input type="checkbox"/> Tetra <input type="checkbox"/>			
PAHS 8310 <input type="checkbox"/> SIM <input type="checkbox"/>			
Metals, Total or Dissolved (See list below) Cyanide <input type="checkbox"/>			
PH Cond. Cl ⁻ SO ₄ PO ₄ F ⁻ NO ₃ NO ₃ BOD TSS TDS (circle) NH ₃ -N COD Total-P TKN TOC DOC (circle) NO ₂ +NO ₃			
TOX 9020 <input type="checkbox"/> AOX 1650 <input type="checkbox"/> 506 <input type="checkbox"/>			
REMARKS			

REPORT REQUIREMENTS
☒ I. Routine Report: Method Blank, Surrogate, as required
☐ II. Report Dup., MS, MSD as required
☐ III. Data Validation Report (includes all raw data)
☐ IV. CLP Deliverable Report
☐ V. EDD

INVOICE INFORMATION
P.O. # _____
Bill To: _____

TURNAROUND REQUIREMENTS
24 hr. _____ 48 hr. _____
5 Day _____
☒ Standard (10-15 working days)
Provide FAX Results _____
Requested Report Date _____

Circle which metals are to be analyzed:
Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg
Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
Please run low-level 8270 + 8081 analysis
Thanks.

RELINQUISHED BY:	RECEIVED BY:
<u>Kona Kunch</u> Signature <u>City of Portland</u> Date/Time Firm	<u>Duff</u> Signature <u>6/5/09 10:05</u> Date/Time Firm
<u>Kona Kunch</u> Printed Name	<u>Duff</u> Printed Name

RELINQUISHED BY:	RECEIVED BY:
<u>Kona Kunch</u> Signature <u>City of Portland</u> Date/Time Firm	<u>Duff</u> Signature <u>6/5/09 1:30</u> Date/Time Firm
<u>Kona Kunch</u> Printed Name	<u>Duff</u> Printed Name

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC PD

Client / Project: City of Portland Service Request K09 05065

Received: 6-5-09 Opened: 6-5-09 By: bu

1. Samples were received via? US Mail Fed Ex UPS DHL GH GS PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other Courier cooler NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Is shipper's air-bill filed? If not, record air-bill number: _____ NA Y N

5. Temperature of cooler(s) upon receipt (°C): 3-1
Temperature Blank (°C): N-P
Thermometer ID: 470257

6. If applicable, list Chain of Custody Numbers: _____
7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? Indicate in the table below. NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles tested* received at the appropriate pH? Indicate in the table below. NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection? NA Y N
16. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

Additional Notes, Discrepancies, & Resolutions: _____

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inli
Sample Matrix: Sludge, solid

Service Request: K0905065

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
FO 095671	K0905065-001	06/04/2009	06/05/2009	06/10/2009	63.9	
FO 095672	K0905065-002	06/04/2009	06/05/2009	06/10/2009	61.7	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inli
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009
Date Analyzed: 06/10/2009

Duplicate Sample Summary
Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: Wet

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
FO 095671	K0905065-001	63.9	63.3	63.6	<1	

Organochlorine Pesticides
EPA Method 8081
Sediments

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095671
Lab Code: K0905065-001
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.79	0.11	1	06/09/09	06/19/09	KWG0904936	
beta-BHC	ND	U	0.79	0.18	1	06/09/09	06/19/09	KWG0904936	
gamma-BHC (Lindane)	ND	U	0.79	0.080	1	06/09/09	06/19/09	KWG0904936	
delta-BHC	ND	U	0.79	0.074	1	06/09/09	06/19/09	KWG0904936	
Heptachlor	ND	U	0.79	0.12	1	06/09/09	06/19/09	KWG0904936	
Aldrin	0.54	J	0.79	0.16	1	06/09/09	06/19/09	KWG0904936	
Heptachlor Epoxide	ND	U	0.79	0.084	1	06/09/09	06/19/09	KWG0904936	
gamma-Chlordane†	0.19	JP	0.79	0.090	1	06/09/09	06/19/09	KWG0904936	
Endosulfan I	0.13	JP	0.79	0.063	1	06/09/09	06/19/09	KWG0904936	
alpha-Chlordane	0.15	JP	0.79	0.10	1	06/09/09	06/19/09	KWG0904936	
Dieldrin	ND	Ui	0.79	0.17	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDE	0.97		0.79	0.11	1	06/09/09	06/19/09	KWG0904936	
Endrin	ND	U	0.79	0.094	1	06/09/09	06/19/09	KWG0904936	
Endosulfan II	ND	U	0.79	0.14	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDD	0.70	JP	0.79	0.11	1	06/09/09	06/19/09	KWG0904936	
Endrin Aldehyde	ND	U	0.79	0.12	1	06/09/09	06/19/09	KWG0904936	
Endosulfan Sulfate	ND	U	0.79	0.11	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDT	0.46	JP	0.79	0.17	1	06/09/09	06/19/09	KWG0904936	
Endrin Ketone	ND	U	0.79	0.093	1	06/09/09	06/19/09	KWG0904936	
Methoxychlor	ND	U	0.79	0.19	1	06/09/09	06/19/09	KWG0904936	
Toxaphene	ND	Ui	40	11	1	06/09/09	06/19/09	KWG0904936	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	90	25-125	06/19/09	Acceptable
Decachlorobiphenyl	82	22-142	06/19/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095672
Lab Code: K0905065-002
Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.81	0.11	1	06/09/09	06/19/09	KWG0904936	
beta-BHC	ND	U	0.81	0.18	1	06/09/09	06/19/09	KWG0904936	
gamma-BHC (Lindane)	ND	U	0.81	0.080	1	06/09/09	06/19/09	KWG0904936	
delta-BHC	ND	U	0.81	0.074	1	06/09/09	06/19/09	KWG0904936	
Heptachlor	ND	U	0.81	0.12	1	06/09/09	06/19/09	KWG0904936	
Aldrin	ND	U	0.81	0.16	1	06/09/09	06/19/09	KWG0904936	
Heptachlor Epoxide	ND	U	0.81	0.084	1	06/09/09	06/19/09	KWG0904936	
gamma-Chlordane†	ND	U	0.81	0.090	1	06/09/09	06/19/09	KWG0904936	
Endosulfan I	ND	Ui	0.81	0.097	1	06/09/09	06/19/09	KWG0904936	
alpha-Chlordane	ND	U	0.81	0.10	1	06/09/09	06/19/09	KWG0904936	
Dieldrin	ND	U	0.81	0.14	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDE	ND	Ui	0.81	0.35	1	06/09/09	06/19/09	KWG0904936	
Endrin	ND	U	0.81	0.094	1	06/09/09	06/19/09	KWG0904936	
Endosulfan II	ND	U	0.81	0.14	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDD	ND	Ui	0.81	0.31	1	06/09/09	06/19/09	KWG0904936	
Endrin Aldehyde	ND	U	0.81	0.12	1	06/09/09	06/19/09	KWG0904936	
Endosulfan Sulfate	ND	U	0.81	0.11	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDT	ND	U	0.81	0.17	1	06/09/09	06/19/09	KWG0904936	
Endrin Ketone	ND	Ui	0.81	0.24	1	06/09/09	06/19/09	KWG0904936	
Methoxychlor	ND	Ui	0.81	0.21	1	06/09/09	06/19/09	KWG0904936	
Toxaphene	ND	U	41	4.8	1	06/09/09	06/19/09	KWG0904936	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	80	25-125	06/19/09	Acceptable
Decachlorobiphenyl	74	22-142	06/19/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Sediment

Service Request: K0905065
 Date Collected: NA
 Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
 Lab Code: KWG0904936-5

Units: ug/Kg
 Basis: Dry

Extraction Method: EPA 3541

Level: Low

Analysis Method: 8081A

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.11	1	06/09/09	06/19/09	KWG0904936	
beta-BHC	ND	U	0.50	0.18	1	06/09/09	06/19/09	KWG0904936	
gamma-BHC (Lindane)	ND	U	0.50	0.080	1	06/09/09	06/19/09	KWG0904936	
delta-BHC	ND	U	0.50	0.074	1	06/09/09	06/19/09	KWG0904936	
Heptachlor	ND	U	0.50	0.12	1	06/09/09	06/19/09	KWG0904936	
Aldrin	ND	U	0.50	0.16	1	06/09/09	06/19/09	KWG0904936	
Heptachlor Epoxide	ND	U	0.50	0.084	1	06/09/09	06/19/09	KWG0904936	
gamma-Chlordane†	ND	U	0.50	0.090	1	06/09/09	06/19/09	KWG0904936	
Endosulfan I	ND	U	0.50	0.063	1	06/09/09	06/19/09	KWG0904936	
alpha-Chlordane	ND	U	0.50	0.10	1	06/09/09	06/19/09	KWG0904936	
Dieldrin	ND	U	0.50	0.14	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDE	ND	U	0.50	0.11	1	06/09/09	06/19/09	KWG0904936	
Endrin	ND	U	0.50	0.094	1	06/09/09	06/19/09	KWG0904936	
Endosulfan II	ND	U	0.50	0.14	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDD	ND	U	0.50	0.11	1	06/09/09	06/19/09	KWG0904936	
Endrin Aldehyde	ND	U	0.50	0.12	1	06/09/09	06/19/09	KWG0904936	
Endosulfan Sulfate	ND	U	0.50	0.11	1	06/09/09	06/19/09	KWG0904936	
4,4'-DDT	ND	U	0.50	0.17	1	06/09/09	06/19/09	KWG0904936	
Endrin Ketone	ND	U	0.50	0.093	1	06/09/09	06/19/09	KWG0904936	
Methoxychlor	ND	U	0.50	0.19	1	06/09/09	06/19/09	KWG0904936	
Toxaphene	ND	U	25	4.8	1	06/09/09	06/19/09	KWG0904936	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	82	25-125	06/19/09	Acceptable
Decachlorobiphenyl	85	22-142	06/19/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
FO 095671	K0905065-001	90	82
FO 095672	K0905065-002	80	74
Method Blank	KWG0904936-5	82	85
Lab Control Sample	KWG0904936-1	81	81
Duplicate Lab Control Sample	KWG0904936-2	85	86

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	25-125
Sur2 = Decachlorobiphenyl	22-142

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sediment

Service Request: K0905065
Date Extracted: 06/09/2009
Date Analyzed: 06/19/2009

**Lab Control Spike/Duplicate Lab Control Spike Summary
 Organochlorine Pesticides**

Extraction Method: EPA 3541
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0904936

Analyte Name	Lab Control Sample KWG0904936-1 Lab Control Spike			Duplicate Lab Control Sample KWG0904936-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	19.4	20.0	97	21.2	20.0	106	45-150	9	40
beta-BHC	19.8	20.0	99	20.9	20.0	105	47-149	6	40
gamma-BHC (Lindane)	19.5	20.0	97	21.2	20.0	106	48-146	9	40
delta-BHC	21.1	20.0	106	23.1	20.0	116	59-162	9	40
Heptachlor	18.6	20.0	93	20.2	20.0	101	47-142	8	40
Aldrin	17.4	20.0	87	19.0	20.0	95	43-141	9	40
Heptachlor Epoxide	16.8	20.0	84	18.5	20.0	93	48-140	10	40
gamma-Chlordane	18.7	20.0	93	20.4	20.0	102	42-145	9	40
Endosulfan I	12.5	20.0	62	13.5	20.0	67	36-124	8	40
alpha-Chlordane	18.2	20.0	91	20.4	20.0	102	42-145	11	40
Dieldrin	18.9	20.0	94	20.9	20.0	105	50-142	10	40
4,4'-DDE	18.9	20.0	95	21.3	20.0	107	51-149	12	40
Endrin	21.3	20.0	106	23.5	20.0	118	54-155	10	40
Endosulfan II	15.1	20.0	75	16.3	20.0	82	42-130	8	40
4,4'-DDD	20.4	20.0	102	22.3	20.0	112	51-152	9	40
Endrin Aldehyde	6.52	20.0	33	8.50	20.0	43	31-139	26	40
Endosulfan Sulfate	18.8	20.0	94	20.9	20.0	105	48-143	11	40
4,4'-DDT	20.2	20.0	101	22.5	20.0	112	59-151	11	40
Endrin Ketone	17.5	20.0	88	19.5	20.0	97	41-158	11	40
Methoxychlor	20.9	20.0	105	23.6	20.0	118	55-153	12	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Organochlorine Pesticides

EPA Method 8081

Waters

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Water

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095673
Lab Code: K0905065-003
Extraction Method: EPA 3535
Analysis Method: 8081A

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
beta-BHC	ND	U	0.50	0.41	1	06/10/09	06/16/09	KWG0905002	
gamma-BHC (Lindane)	ND	U	0.50	0.47	1	06/10/09	06/16/09	KWG0905002	
delta-BHC	ND	U	0.50	0.14	1	06/10/09	06/16/09	KWG0905002	
Heptachlor	ND	U	0.50	0.18	1	06/10/09	06/16/09	KWG0905002	
Aldrin	ND	U	0.50	0.11	1	06/10/09	06/16/09	KWG0905002	
Heptachlor Epoxide	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
gamma-Chlordane†	ND	U	0.50	0.31	1	06/10/09	06/16/09	KWG0905002	
Endosulfan I	ND	U	0.50	0.25	1	06/10/09	06/16/09	KWG0905002	
alpha-Chlordane	ND	U	0.50	0.27	1	06/10/09	06/16/09	KWG0905002	
Dieldrin	ND	U	0.50	0.37	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDE	ND	Ui	1.9	1.9	1	06/10/09	06/16/09	KWG0905002	
Endrin	ND	U	0.50	0.49	1	06/10/09	06/16/09	KWG0905002	
Endosulfan II	0.96		0.50	0.35	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDD	ND	Ui	1.8	1.8	1	06/10/09	06/16/09	KWG0905002	
Endrin Aldehyde	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
Endosulfan Sulfate	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDT	ND	Ui	0.72	0.72	1	06/10/09	06/16/09	KWG0905002	
Endrin Ketone	ND	U	0.50	0.32	1	06/10/09	06/16/09	KWG0905002	
Methoxychlor	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
Toxaphene	ND	Ui	54	54	1	06/10/09	06/16/09	KWG0905002	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	57	10-121	06/16/09	Acceptable
Decachlorobiphenyl	74	17-150	06/16/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Water

Service Request: K0905065
 Date Collected: 06/04/2009
 Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095674
 Lab Code: K0905065-004
 Extraction Method: EPA 3535
 Analysis Method: 8081A

Units: ng/L
 Basis: NA
 Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
beta-BHC	ND	U	0.52	0.43	1	06/10/09	06/16/09	KWG0905002	
gamma-BHC (Lindane)	ND	U	0.52	0.49	1	06/10/09	06/16/09	KWG0905002	
delta-BHC	ND	Ui	0.52	0.19	1	06/10/09	06/16/09	KWG0905002	
Heptachlor	ND	U	0.52	0.19	1	06/10/09	06/16/09	KWG0905002	
Aldrin	ND	U	0.52	0.12	1	06/10/09	06/16/09	KWG0905002	
Heptachlor Epoxide	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
gamma-Chlordane†	ND	U	0.52	0.32	1	06/10/09	06/16/09	KWG0905002	
Endosulfan I	ND	U	0.52	0.26	1	06/10/09	06/16/09	KWG0905002	
alpha-Chlordane	ND	U	0.52	0.28	1	06/10/09	06/16/09	KWG0905002	
Dieldrin	ND	U	0.52	0.38	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDE	ND	Ui	1.7	1.7	1	06/10/09	06/16/09	KWG0905002	
Endrin	ND	U	0.52	0.51	1	06/10/09	06/16/09	KWG0905002	
Endosulfan II	ND	Ui	0.62	0.62	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDD	ND	Ui	1.8	1.8	1	06/10/09	06/16/09	KWG0905002	
Endrin Aldehyde	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
Endosulfan Sulfate	ND	U	0.52	0.29	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDT	ND	U	0.52	0.18	1	06/10/09	06/16/09	KWG0905002	
Endrin Ketone	ND	U	0.52	0.33	1	06/10/09	06/16/09	KWG0905002	
Methoxychlor	ND	U	0.52	0.29	1	06/10/09	06/16/09	KWG0905002	
Toxaphene	ND	Ui	44	44	1	06/10/09	06/16/09	KWG0905002	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	55	10-121	06/16/09	Acceptable
Decachlorobiphenyl	72	17-150	06/16/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Water

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095675
Lab Code: K0905065-005
Extraction Method: EPA 3535
Analysis Method: 8081A

Units: ng/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
beta-BHC	ND	U	0.50	0.41	1	06/10/09	06/16/09	KWG0905002	
gamma-BHC (Lindane)	ND	U	0.50	0.47	1	06/10/09	06/16/09	KWG0905002	
delta-BHC	ND	U	0.50	0.14	1	06/10/09	06/16/09	KWG0905002	
Heptachlor	ND	U	0.50	0.18	1	06/10/09	06/16/09	KWG0905002	
Aldrin	ND	U	0.50	0.11	1	06/10/09	06/16/09	KWG0905002	
Heptachlor Epoxide	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
gamma-Chlordane†	ND	U	0.50	0.31	1	06/10/09	06/16/09	KWG0905002	
Endosulfan I	ND	U	0.50	0.25	1	06/10/09	06/16/09	KWG0905002	
alpha-Chlordane	ND	U	0.50	0.27	1	06/10/09	06/16/09	KWG0905002	
Dieldrin	ND	U	0.50	0.37	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDE	ND	Ui	1.2	1.2	1	06/10/09	06/16/09	KWG0905002	
Endrin	ND	U	0.50	0.49	1	06/10/09	06/16/09	KWG0905002	
Endosulfan II	0.88	P	0.50	0.35	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDD	ND	Ui	1.8	1.8	1	06/10/09	06/16/09	KWG0905002	
Endrin Aldehyde	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
Endosulfan Sulfate	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDT	ND	U	0.50	0.17	1	06/10/09	06/16/09	KWG0905002	
Endrin Ketone	ND	U	0.50	0.32	1	06/10/09	06/16/09	KWG0905002	
Methoxychlor	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
Toxaphene	ND	Ui	94	94	1	06/10/09	06/16/09	KWG0905002	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	52	10-121	06/16/09	Acceptable
Decachlorobiphenyl	71	17-150	06/16/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Water

Service Request: K0905065
 Date Collected: 06/04/2009
 Date Received: 06/05/2009

Organochlorine Pesticides

Sample Name: FO 095676
 Lab Code: K0905065-006
 Extraction Method: EPA 3535
 Analysis Method: 8081A

Units: ng/L
 Basis: NA
 Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
beta-BHC	ND	U	0.52	0.43	1	06/10/09	06/16/09	KWG0905002	
gamma-BHC (Lindane)	ND	U	0.52	0.49	1	06/10/09	06/16/09	KWG0905002	
delta-BHC	ND	U	0.52	0.15	1	06/10/09	06/16/09	KWG0905002	
Heptachlor	ND	U	0.52	0.19	1	06/10/09	06/16/09	KWG0905002	
Aldrin	ND	Ui	0.52	0.52	1	06/10/09	06/16/09	KWG0905002	
Heptachlor Epoxide	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
gamma-Chlordane†	ND	U	0.52	0.32	1	06/10/09	06/16/09	KWG0905002	
Endosulfan I	ND	Ui	1.2	1.2	1	06/10/09	06/16/09	KWG0905002	
alpha-Chlordane	ND	U	0.52	0.28	1	06/10/09	06/16/09	KWG0905002	
Dieldrin	ND	U	0.52	0.38	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDE	ND	Ui	1.6	1.6	1	06/10/09	06/16/09	KWG0905002	
Endrin	ND	U	0.52	0.51	1	06/10/09	06/16/09	KWG0905002	
Endosulfan II	0.59		0.52	0.36	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDD	ND	Ui	2.3	2.3	1	06/10/09	06/16/09	KWG0905002	
Endrin Aldehyde	ND	U	0.52	0.22	1	06/10/09	06/16/09	KWG0905002	
Endosulfan Sulfate	ND	U	0.52	0.29	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDT	ND	U	0.52	0.18	1	06/10/09	06/16/09	KWG0905002	
Endrin Ketone	ND	U	0.52	0.33	1	06/10/09	06/16/09	KWG0905002	
Methoxychlor	ND	U	0.52	0.29	1	06/10/09	06/16/09	KWG0905002	
Toxaphene	ND	Ui	180	180	1	06/10/09	06/16/09	KWG0905002	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	49	10-121	06/16/09	Acceptable
Decachlorobiphenyl	68	17-150	06/16/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Water

Service Request: K0905065
 Date Collected: NA
 Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
 Lab Code: KWG0905002-13
 Extraction Method: EPA 3535
 Analysis Method: 8081A

Units: ng/L
 Basis: NA
 Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
beta-BHC	ND	U	0.50	0.41	1	06/10/09	06/16/09	KWG0905002	
gamma-BHC (Lindane)	ND	U	0.50	0.47	1	06/10/09	06/16/09	KWG0905002	
delta-BHC	ND	U	0.50	0.14	1	06/10/09	06/16/09	KWG0905002	
Heptachlor	ND	U	0.50	0.18	1	06/10/09	06/16/09	KWG0905002	
Aldrin	ND	U	0.50	0.11	1	06/10/09	06/16/09	KWG0905002	
Heptachlor Epoxide	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
gamma-Chlordane†	ND	U	0.50	0.31	1	06/10/09	06/16/09	KWG0905002	
Endosulfan I	ND	Ui	0.50	0.40	1	06/10/09	06/16/09	KWG0905002	
alpha-Chlordane	ND	U	0.50	0.27	1	06/10/09	06/16/09	KWG0905002	
Dieldrin	ND	U	0.50	0.37	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDE	ND	Ui	1.5	1.5	1	06/10/09	06/16/09	KWG0905002	
Endrin	ND	U	0.50	0.49	1	06/10/09	06/16/09	KWG0905002	
Endosulfan II	ND	Ui	0.65	0.65	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDD	ND	Ui	2.1	2.1	1	06/10/09	06/16/09	KWG0905002	
Endrin Aldehyde	ND	U	0.50	0.21	1	06/10/09	06/16/09	KWG0905002	
Endosulfan Sulfate	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
4,4'-DDT	ND	U	0.50	0.17	1	06/10/09	06/16/09	KWG0905002	
Endrin Ketone	ND	Ui	0.53	0.53	1	06/10/09	06/16/09	KWG0905002	
Methoxychlor	ND	U	0.50	0.28	1	06/10/09	06/16/09	KWG0905002	
Toxaphene	ND	Ui	25	23	1	06/10/09	06/16/09	KWG0905002	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	56	10-121	06/16/09	Acceptable
Decachlorobiphenyl	79	17-150	06/16/09	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Water

Service Request: K0905065

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3535
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
FO 095673	K0905065-003	57	74
FO 095674	K0905065-004	55	72
FO 095675	K0905065-005	52	71
FO 095676	K0905065-006	49	68
Method Blank	KWG0905002-13	56	79
Lab Control Sample	KWG0905002-1	42	78
Duplicate Lab Control Sample	KWG0905002-2	39	77

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	10-121
Sur2 = Decachlorobiphenyl	17-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
 Project: Portland Harbor Inline Samp
 Sample Matrix: Water

Service Request: K0905065
 Date Extracted: 06/10/2009
 Date Analyzed: 06/16/2009

Lab Control Spike/Duplicate Lab Control Spike Summary
 Organochlorine Pesticides

Extraction Method: EPA 3535
 Analysis Method: 8081A

Units: ng/L
 Basis: NA
 Level: Low
 Extraction Lot: KWG0905002

Analyte Name	Lab Control Sample KWG0905002-1 Lab Control Spike			Duplicate Lab Control Sample KWG0905002-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	7.91	10.0	79	8.20	10.0	82	43-127	4	30
beta-BHC	8.78	10.0	88	8.66	10.0	87	41-129	1	30
gamma-BHC (Lindane)	8.07	10.0	81	8.32	10.0	83	42-128	3	30
delta-BHC	8.49	10.0	85	8.62	10.0	86	47-141	1	30
Heptachlor	7.73	10.0	77	7.55	10.0	76	34-126	2	30
Aldrin	6.01	10.0	60	6.18	10.0	62	10-125	3	30
Heptachlor Epoxide	7.98	10.0	80	7.52	10.0	75	45-124	6	30
gamma-Chlordane	8.16	10.0	82	8.53	10.0	85	48-119	4	30
Endosulfan I	8.02	10.0	80	9.01	10.0	90	30-115	12	30
alpha-Chlordane	8.07	10.0	81	8.57	10.0	86	48-119	6	30
Dieldrin	8.43	10.0	84	8.71	10.0	87	50-120	3	30
4,4'-DDE	8.83	10.0	88	11.7	10.0	117	36-137	28	30
Endrin	9.44	10.0	94	9.22	10.0	92	53-132	2	30
Endosulfan II	9.41	10.0	94	9.12	10.0	91	32-123	3	30
4,4'-DDD	8.94	10.0	89	12.1	10.0	121	38-140	30	30
Endrin Aldehyde	7.06	10.0	71	7.24	10.0	72	30-114	3	30
Endosulfan Sulfate	8.41	10.0	84	8.67	10.0	87	46-120	3	30
4,4'-DDT	9.57	10.0	96	9.83	10.0	98	45-146	3	30
Endrin Ketone	8.35	10.0	83	8.46	10.0	85	45-127	1	30
Methoxychlor	10.2	10.0	102	10.6	10.0	106	48-140	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Semi-Volatile Organic Compounds EPA Method 8270C

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095671
Lab Code: K0905065-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	7.9	1.9	1	06/08/09	06/15/09	KWG0904879	
Phenol	5.0	J	24	2.0	1	06/08/09	06/15/09	KWG0904879	
2-Chlorophenol	ND	U	7.9	2.0	1	06/08/09	06/15/09	KWG0904879	
1,3-Dichlorobenzene	ND	U	7.9	3.0	1	06/08/09	06/15/09	KWG0904879	
1,4-Dichlorobenzene	ND	U	7.9	2.9	1	06/08/09	06/15/09	KWG0904879	
1,2-Dichlorobenzene	ND	U	7.9	2.9	1	06/08/09	06/15/09	KWG0904879	
Benzyl Alcohol	ND	U	16	2.1	1	06/08/09	06/15/09	KWG0904879	
Bis(2-chloroisopropyl) Ether	ND	U	7.9	2.6	1	06/08/09	06/15/09	KWG0904879	
2-Methylphenol	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Hexachloroethane	ND	U	7.9	3.1	1	06/08/09	06/15/09	KWG0904879	
N-Nitrosodi-n-propylamine	ND	U	7.9	2.4	1	06/08/09	06/15/09	KWG0904879	
4-Methylphenol†	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Nitrobenzene	ND	U	7.9	2.2	1	06/08/09	06/15/09	KWG0904879	
Isophorone	ND	U	7.9	1.0	1	06/08/09	06/15/09	KWG0904879	
2-Nitrophenol	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
2,4-Dimethylphenol	ND	U	40	5.5	1	06/08/09	06/15/09	KWG0904879	
Bis(2-chloroethoxy)methane	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
2,4-Dichlorophenol	ND	U	7.9	1.0	1	06/08/09	06/15/09	KWG0904879	
Benzoic Acid	99	J	160	96	1	06/08/09	06/15/09	KWG0904879	
1,2,4-Trichlorobenzene	ND	U	7.9	2.6	1	06/08/09	06/15/09	KWG0904879	
Naphthalene	3.3	J	7.9	2.3	1	06/08/09	06/15/09	KWG0904879	
4-Chloroaniline	ND	U	7.9	1.9	1	06/08/09	06/15/09	KWG0904879	
Hexachlorobutadiene	ND	U	7.9	2.5	1	06/08/09	06/15/09	KWG0904879	
4-Chloro-3-methylphenol	ND	U	7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
2-Methylnaphthalene	ND	U	7.9	2.2	1	06/08/09	06/15/09	KWG0904879	
Hexachlorocyclopentadiene	ND	U	40	29	1	06/08/09	06/15/09	KWG0904879	
2,4,6-Trichlorophenol	ND	U	7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
2,4,5-Trichlorophenol	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
2-Chloronaphthalene	ND	U	7.9	1.6	1	06/08/09	06/15/09	KWG0904879	
2-Nitroaniline	ND	U	16	3.2	1	06/08/09	06/15/09	KWG0904879	
Acenaphthylene	3.7	J	7.9	1.2	1	06/08/09	06/15/09	KWG0904879	
Dimethyl Phthalate	ND	U	7.9	1.0	1	06/08/09	06/15/09	KWG0904879	
2,6-Dinitrotoluene	ND	U	7.9	2.0	1	06/08/09	06/15/09	KWG0904879	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095671
Lab Code: K0905065-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
3-Nitroaniline	ND	U	16	2.5	1	06/08/09	06/15/09	KWG0904879	
2,4-Dinitrophenol	ND	U	160	17	1	06/08/09	06/15/09	KWG0904879	
Dibenzofuran	ND	U	7.9	1.2	1	06/08/09	06/15/09	KWG0904879	
4-Nitrophenol	ND	U	79	18	1	06/08/09	06/15/09	KWG0904879	
2,4-Dinitrotoluene	ND	U	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Fluorene	ND	U	7.9	1.1	1	06/08/09	06/15/09	KWG0904879	
4-Chlorophenyl Phenyl Ether	ND	U	7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
Diethyl Phthalate	ND	U	7.9	1.3	1	06/08/09	06/15/09	KWG0904879	
4-Nitroaniline	ND	U	16	1.8	1	06/08/09	06/15/09	KWG0904879	
2-Methyl-4,6-dinitrophenol	ND	U	79	1.4	1	06/08/09	06/15/09	KWG0904879	
N-Nitrosodiphenylamine	ND	U	7.9	1.6	1	06/08/09	06/15/09	KWG0904879	
4-Bromophenyl Phenyl Ether	ND	U	7.9	1.6	1	06/08/09	06/15/09	KWG0904879	
Hexachlorobenzene	ND	U	7.9	1.2	1	06/08/09	06/15/09	KWG0904879	
Pentachlorophenol	ND	U	79	20	1	06/08/09	06/15/09	KWG0904879	
Phenanthrene	23		7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
Anthracene	8.8		7.9	1.6	1	06/08/09	06/15/09	KWG0904879	
Di-n-butyl Phthalate	ND	U	16	7.9	1	06/08/09	06/15/09	KWG0904879	
Fluoranthene	46		7.9	1.6	1	06/08/09	06/15/09	KWG0904879	
Pyrene	52		7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Butyl Benzyl Phthalate	ND	U	7.9	3.2	1	06/08/09	06/15/09	KWG0904879	
3,3'-Dichlorobenzidine	ND	U	79	3.7	1	06/08/09	06/15/09	KWG0904879	
Benz(a)anthracene	27		7.9	1.7	1	06/08/09	06/15/09	KWG0904879	
Chrysene	31		7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Bis(2-ethylhexyl) Phthalate	43	J	79	7.0	1	06/08/09	06/15/09	KWG0904879	
Di-n-octyl Phthalate	ND	U	7.9	1.7	1	06/08/09	06/15/09	KWG0904879	
Benzo(b)fluoranthene	27		7.9	1.2	1	06/08/09	06/15/09	KWG0904879	
Benzo(k)fluoranthene	11		7.9	1.4	1	06/08/09	06/15/09	KWG0904879	
Benzo(a)pyrene	26		7.9	1.7	1	06/08/09	06/15/09	KWG0904879	
Indeno(1,2,3-cd)pyrene	15		7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Dibenz(a,h)anthracene	4.1	J	7.9	1.5	1	06/08/09	06/15/09	KWG0904879	
Benzo(g,h,i)perylene	17		7.9	1.5	1	06/08/09	06/15/09	KWG0904879	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095671
Lab Code: K0905065-001

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	20	11-80	06/15/09	Acceptable
Phenol-d6	37	20-86	06/15/09	Acceptable
Nitrobenzene-d5	60	27-91	06/15/09	Acceptable
2-Fluorobiphenyl	56	25-97	06/15/09	Acceptable
2,4,6-Tribromophenol	36	10-119	06/15/09	Acceptable
Terphenyl-d14	77	33-129	06/15/09	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095672
Lab Code: K0905065-002
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	9.9	1.9	1	06/18/09	06/24/09	KWG0905322	
Phenol	9.4	J	30	2.0	1	06/18/09	06/24/09	KWG0905322	
2-Chlorophenol	ND	U	9.9	2.0	1	06/18/09	06/24/09	KWG0905322	
1,3-Dichlorobenzene	ND	U	9.9	3.0	1	06/18/09	06/24/09	KWG0905322	
1,4-Dichlorobenzene	ND	U	9.9	2.9	1	06/18/09	06/24/09	KWG0905322	
1,2-Dichlorobenzene	ND	U	9.9	2.9	1	06/18/09	06/24/09	KWG0905322	
Benzyl Alcohol	ND	U	20	2.1	1	06/18/09	06/24/09	KWG0905322	
Bis(2-chloroisopropyl) Ether	ND	U	9.9	2.6	1	06/18/09	06/24/09	KWG0905322	
2-Methylphenol	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Hexachloroethane	ND	U	9.9	3.1	1	06/18/09	06/24/09	KWG0905322	
N-Nitrosodi-n-propylamine	ND	U	9.9	2.4	1	06/18/09	06/24/09	KWG0905322	
4-Methylphenol†	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Nitrobenzene	ND	U	9.9	2.2	1	06/18/09	06/24/09	KWG0905322	
Isophorone	ND	U	9.9	1.0	1	06/18/09	06/24/09	KWG0905322	
2-Nitrophenol	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dimethylphenol	ND	U	50	5.5	1	06/18/09	06/24/09	KWG0905322	
Bis(2-chloroethoxy)methane	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dichlorophenol	ND	U	9.9	1.0	1	06/18/09	06/24/09	KWG0905322	
Benzoic Acid	120	J	200	96	1	06/18/09	06/24/09	KWG0905322	
1,2,4-Trichlorobenzene	ND	U	9.9	2.6	1	06/18/09	06/24/09	KWG0905322	
Naphthalene	ND	U	9.9	2.3	1	06/18/09	06/24/09	KWG0905322	
4-Chloroaniline	ND	U	9.9	1.9	1	06/18/09	06/24/09	KWG0905322	
Hexachlorobutadiene	ND	U	9.9	2.5	1	06/18/09	06/24/09	KWG0905322	
4-Chloro-3-methylphenol	ND	U	9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
2-Methylnaphthalene	ND	U	9.9	2.2	1	06/18/09	06/24/09	KWG0905322	
Hexachlorocyclopentadiene	ND	U	50	29	1	06/18/09	06/24/09	KWG0905322	
2,4,6-Trichlorophenol	ND	U	9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
2,4,5-Trichlorophenol	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
2-Chloronaphthalene	ND	U	9.9	1.6	1	06/18/09	06/24/09	KWG0905322	
2-Nitroaniline	ND	U	20	3.2	1	06/18/09	06/24/09	KWG0905322	
Acenaphthylene	2.3	J	9.9	1.2	1	06/18/09	06/24/09	KWG0905322	
Dimethyl Phthalate	1.5	J	9.9	1.0	1	06/18/09	06/24/09	KWG0905322	
2,6-Dinitrotoluene	ND	U	9.9	2.0	1	06/18/09	06/24/09	KWG0905322	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095672
Lab Code: K0905065-002
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
3-Nitroaniline	ND	U	20	2.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dinitrophenol	ND	U	200	17	1	06/18/09	06/24/09	KWG0905322	
Dibenzofuran	ND	U	9.9	1.2	1	06/18/09	06/24/09	KWG0905322	
4-Nitrophenol	ND	U	99	18	1	06/18/09	06/24/09	KWG0905322	
2,4-Dinitrotoluene	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Fluorene	1.5	J	9.9	1.1	1	06/18/09	06/24/09	KWG0905322	
4-Chlorophenyl Phenyl Ether	ND	U	9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
Diethyl Phthalate	ND	U	9.9	1.3	1	06/18/09	06/24/09	KWG0905322	
4-Nitroaniline	ND	U	20	1.8	1	06/18/09	06/24/09	KWG0905322	
2-Methyl-4,6-dinitrophenol	ND	U	99	1.4	1	06/18/09	06/24/09	KWG0905322	
N-Nitrosodiphenylamine	ND	U	9.9	1.6	1	06/18/09	06/24/09	KWG0905322	
4-Bromophenyl Phenyl Ether	ND	U	9.9	1.6	1	06/18/09	06/24/09	KWG0905322	
Hexachlorobenzene	ND	U	9.9	1.2	1	06/18/09	06/24/09	KWG0905322	
Pentachlorophenol	ND	U	99	20	1	06/18/09	06/24/09	KWG0905322	
Phenanthrene	13		9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
Anthracene	2.4	J	9.9	1.6	1	06/18/09	06/24/09	KWG0905322	
Di-n-butyl Phthalate	ND	U	20	7.9	1	06/18/09	06/24/09	KWG0905322	
Fluoranthene	17		9.9	1.6	1	06/18/09	06/24/09	KWG0905322	
Pyrene	26		9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Butyl Benzyl Phthalate	ND	U	9.9	3.2	1	06/18/09	06/24/09	KWG0905322	
3,3'-Dichlorobenzidine	ND	U	99	3.7	1	06/18/09	06/24/09	KWG0905322	
Benz(a)anthracene	7.2	J	9.9	1.7	1	06/18/09	06/24/09	KWG0905322	
Chrysene	12		9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Bis(2-ethylhexyl) Phthalate	110		99	7.0	1	06/18/09	06/24/09	KWG0905322	
Di-n-octyl Phthalate	ND	U	9.9	1.7	1	06/18/09	06/24/09	KWG0905322	
Benzo(b)fluoranthene	12		9.9	1.2	1	06/18/09	06/24/09	KWG0905322	
Benzo(k)fluoranthene	4.0	J	9.9	1.4	1	06/18/09	06/24/09	KWG0905322	
Benzo(a)pyrene	9.4	J	9.9	1.7	1	06/18/09	06/24/09	KWG0905322	
Indeno(1,2,3-cd)pyrene	11		9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Dibenz(a,h)anthracene	ND	U	9.9	1.5	1	06/18/09	06/24/09	KWG0905322	
Benzo(g,h,i)perylene	12		9.9	1.5	1	06/18/09	06/24/09	KWG0905322	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: 06/04/2009
Date Received: 06/05/2009

Semi-Volatile Organic Compounds by GC/MS

Sample Name: FO 095672
Lab Code: K0905065-002

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	18	11-80	06/24/09	Acceptable
Phenol-d6	34	20-86	06/24/09	Acceptable
Nitrobenzene-d5	67	27-91	06/24/09	Acceptable
2-Fluorobiphenyl	63	25-97	06/24/09	Acceptable
2,4,6-Tribromophenol	46	10-119	06/24/09	Acceptable
Terphenyl-d14	104	33-129	06/24/09	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0904879-5

Units: ug/Kg
Basis: Dry
Level: Low

Extraction Method: EPA 3541
Analysis Method: 8270C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	5.0	1.9	1	06/08/09	06/12/09	KWG0904879	
Phenol	2.6	J	15	2.0	1	06/08/09	06/12/09	KWG0904879	
2-Chlorophenol	ND	U	5.0	2.0	1	06/08/09	06/12/09	KWG0904879	
1,3-Dichlorobenzene	ND	U	5.0	3.0	1	06/08/09	06/12/09	KWG0904879	
1,4-Dichlorobenzene	ND	U	5.0	2.9	1	06/08/09	06/12/09	KWG0904879	
1,2-Dichlorobenzene	ND	U	5.0	2.9	1	06/08/09	06/12/09	KWG0904879	
Benzyl Alcohol	ND	U	10	2.1	1	06/08/09	06/12/09	KWG0904879	
Bis(2-chloroisopropyl) Ether	ND	U	5.0	2.6	1	06/08/09	06/12/09	KWG0904879	
2-Methylphenol	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Hexachloroethane	ND	U	5.0	3.1	1	06/08/09	06/12/09	KWG0904879	
N-Nitrosodi-n-propylamine	ND	U	5.0	2.4	1	06/08/09	06/12/09	KWG0904879	
4-Methylphenol†	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Nitrobenzene	ND	U	5.0	2.2	1	06/08/09	06/12/09	KWG0904879	
Isophorone	ND	U	5.0	1.0	1	06/08/09	06/12/09	KWG0904879	
2-Nitrophenol	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
2,4-Dimethylphenol	ND	U	25	5.5	1	06/08/09	06/12/09	KWG0904879	
Bis(2-chloroethoxy)methane	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
2,4-Dichlorophenol	ND	U	5.0	1.0	1	06/08/09	06/12/09	KWG0904879	
Benzoic Acid	ND	U	100	96	1	06/08/09	06/12/09	KWG0904879	
1,2,4-Trichlorobenzene	ND	U	5.0	2.6	1	06/08/09	06/12/09	KWG0904879	
Naphthalene	ND	U	5.0	2.3	1	06/08/09	06/12/09	KWG0904879	
4-Chloroaniline	ND	U	5.0	1.9	1	06/08/09	06/12/09	KWG0904879	
Hexachlorobutadiene	ND	U	5.0	2.5	1	06/08/09	06/12/09	KWG0904879	
4-Chloro-3-methylphenol	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
2-Methylnaphthalene	ND	U	5.0	2.2	1	06/08/09	06/12/09	KWG0904879	
Hexachlorocyclopentadiene	ND	U	29	29	1	06/08/09	06/12/09	KWG0904879	
2,4,6-Trichlorophenol	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
2,4,5-Trichlorophenol	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
2-Chloronaphthalene	ND	U	5.0	1.6	1	06/08/09	06/12/09	KWG0904879	
2-Nitroaniline	ND	U	10	3.2	1	06/08/09	06/12/09	KWG0904879	
Acenaphthylene	ND	U	5.0	1.2	1	06/08/09	06/12/09	KWG0904879	
Dimethyl Phthalate	ND	U	5.0	1.0	1	06/08/09	06/12/09	KWG0904879	
2,6-Dinitrotoluene	ND	U	5.0	2.0	1	06/08/09	06/12/09	KWG0904879	

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0904879-5
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
3-Nitroaniline	ND	U	10	2.5	1	06/08/09	06/12/09	KWG0904879	
2,4-Dinitrophenol	ND	U	100	17	1	06/08/09	06/12/09	KWG0904879	
Dibenzofuran	ND	U	5.0	1.2	1	06/08/09	06/12/09	KWG0904879	
4-Nitrophenol	ND	U	50	18	1	06/08/09	06/12/09	KWG0904879	
2,4-Dinitrotoluene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Fluorene	ND	U	5.0	1.1	1	06/08/09	06/12/09	KWG0904879	
4-Chlorophenyl Phenyl Ether	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
Diethyl Phthalate	ND	U	5.0	1.3	1	06/08/09	06/12/09	KWG0904879	
4-Nitroaniline	ND	U	10	1.8	1	06/08/09	06/12/09	KWG0904879	
2-Methyl-4,6-dinitrophenol	ND	U	50	1.4	1	06/08/09	06/12/09	KWG0904879	
N-Nitrosodiphenylamine	ND	U	5.0	1.6	1	06/08/09	06/12/09	KWG0904879	
4-Bromophenyl Phenyl Ether	ND	U	5.0	1.6	1	06/08/09	06/12/09	KWG0904879	
Hexachlorobenzene	ND	U	5.0	1.2	1	06/08/09	06/12/09	KWG0904879	
Pentachlorophenol	ND	U	50	20	1	06/08/09	06/12/09	KWG0904879	
Phenanthrene	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
Anthracene	ND	U	5.0	1.6	1	06/08/09	06/12/09	KWG0904879	
Di-n-butyl Phthalate	ND	U	10	7.9	1	06/08/09	06/12/09	KWG0904879	
Fluoranthene	ND	U	5.0	1.6	1	06/08/09	06/12/09	KWG0904879	
Pyrene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Butyl Benzyl Phthalate	ND	U	5.0	3.2	1	06/08/09	06/12/09	KWG0904879	
3,3'-Dichlorobenzidine	ND	U	50	3.7	1	06/08/09	06/12/09	KWG0904879	
Benz(a)anthracene	ND	U	5.0	1.7	1	06/08/09	06/12/09	KWG0904879	
Chrysene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Bis(2-ethylhexyl) Phthalate	ND	U	50	7.0	1	06/08/09	06/12/09	KWG0904879	
Di-n-octyl Phthalate	ND	U	5.0	1.7	1	06/08/09	06/12/09	KWG0904879	
Benzo(b)fluoranthene	ND	U	5.0	1.2	1	06/08/09	06/12/09	KWG0904879	
Benzo(k)fluoranthene	ND	U	5.0	1.4	1	06/08/09	06/12/09	KWG0904879	
Benzo(a)pyrene	ND	U	5.0	1.7	1	06/08/09	06/12/09	KWG0904879	
Indeno(1,2,3-cd)pyrene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Dibenz(a,h)anthracene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	
Benzo(g,h,i)perylene	ND	U	5.0	1.5	1	06/08/09	06/12/09	KWG0904879	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0904879-5

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	50	11-80	06/12/09	Acceptable
Phenol-d6	52	20-86	06/12/09	Acceptable
Nitrobenzene-d5	48	27-91	06/12/09	Acceptable
2-Fluorobiphenyl	47	25-97	06/12/09	Acceptable
2,4,6-Tribromophenol	61	10-119	06/12/09	Acceptable
Terphenyl-d14	70	33-129	06/12/09	Acceptable

f Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0905322-3

Units: ug/Kg
Basis: Dry
Level: Low

Extraction Method: EPA 3541
Analysis Method: 8270C

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U	6.1	1.9	1	06/18/09	06/24/09	KWG0905322	
Phenol	ND	U	19	2.0	1	06/18/09	06/24/09	KWG0905322	
2-Chlorophenol	ND	U	6.1	2.0	1	06/18/09	06/24/09	KWG0905322	
1,3-Dichlorobenzene	ND	U	6.1	3.0	1	06/18/09	06/24/09	KWG0905322	
1,4-Dichlorobenzene	ND	U	6.1	2.9	1	06/18/09	06/24/09	KWG0905322	
1,2-Dichlorobenzene	ND	U	6.1	2.9	1	06/18/09	06/24/09	KWG0905322	
Benzyl Alcohol	ND	U	13	2.1	1	06/18/09	06/24/09	KWG0905322	
Bis(2-chloroisopropyl) Ether	ND	U	6.1	2.6	1	06/18/09	06/24/09	KWG0905322	
2-Methylphenol	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Hexachloroethane	ND	U	6.1	3.1	1	06/18/09	06/24/09	KWG0905322	
N-Nitrosodi-n-propylamine	ND	U	6.1	2.4	1	06/18/09	06/24/09	KWG0905322	
4-Methylphenol†	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Nitrobenzene	ND	U	6.1	2.2	1	06/18/09	06/24/09	KWG0905322	
Isophorone	ND	U	6.1	1.0	1	06/18/09	06/24/09	KWG0905322	
2-Nitrophenol	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dimethylphenol	ND	U	31	5.5	1	06/18/09	06/24/09	KWG0905322	
Bis(2-chloroethoxy)methane	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dichlorophenol	ND	U	6.1	1.0	1	06/18/09	06/24/09	KWG0905322	
Benzoic Acid	ND	U	130	96	1	06/18/09	06/24/09	KWG0905322	
1,2,4-Trichlorobenzene	ND	U	6.1	2.6	1	06/18/09	06/24/09	KWG0905322	
Naphthalene	ND	U	6.1	2.3	1	06/18/09	06/24/09	KWG0905322	
4-Chloroaniline	ND	U	6.1	1.9	1	06/18/09	06/24/09	KWG0905322	
Hexachlorobutadiene	ND	U	6.1	2.5	1	06/18/09	06/24/09	KWG0905322	
4-Chloro-3-methylphenol	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
2-Methylnaphthalene	ND	U	6.1	2.2	1	06/18/09	06/24/09	KWG0905322	
Hexachlorocyclopentadiene	ND	U	31	29	1	06/18/09	06/24/09	KWG0905322	
2,4,6-Trichlorophenol	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
2,4,5-Trichlorophenol	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
2-Chloronaphthalene	ND	U	6.1	1.6	1	06/18/09	06/24/09	KWG0905322	
2-Nitroaniline	ND	U	13	3.2	1	06/18/09	06/24/09	KWG0905322	
Acenaphthylene	ND	U	6.1	1.2	1	06/18/09	06/24/09	KWG0905322	
Dimethyl Phthalate	ND	U	6.1	1.0	1	06/18/09	06/24/09	KWG0905322	
2,6-Dinitrotoluene	ND	U	6.1	2.0	1	06/18/09	06/24/09	KWG0905322	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0905322-3
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acenaphthene	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
3-Nitroaniline	ND	U	13	2.5	1	06/18/09	06/24/09	KWG0905322	
2,4-Dinitrophenol	ND	U	130	17	1	06/18/09	06/24/09	KWG0905322	
Dibenzofuran	ND	U	6.1	1.2	1	06/18/09	06/24/09	KWG0905322	
4-Nitrophenol	ND	U	61	18	1	06/18/09	06/24/09	KWG0905322	
2,4-Dinitrotoluene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Fluorene	ND	U	6.1	1.1	1	06/18/09	06/24/09	KWG0905322	
4-Chlorophenyl Phenyl Ether	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
Diethyl Phthalate	ND	U	6.1	1.3	1	06/18/09	06/24/09	KWG0905322	
4-Nitroaniline	ND	U	13	1.8	1	06/18/09	06/24/09	KWG0905322	
2-Methyl-4,6-dinitrophenol	ND	U	61	1.4	1	06/18/09	06/24/09	KWG0905322	
N-Nitrosodiphenylamine	ND	U	6.1	1.6	1	06/18/09	06/24/09	KWG0905322	
4-Bromophenyl Phenyl Ether	ND	U	6.1	1.6	1	06/18/09	06/24/09	KWG0905322	
Hexachlorobenzene	ND	U	6.1	1.2	1	06/18/09	06/24/09	KWG0905322	
Pentachlorophenol	ND	U	61	20	1	06/18/09	06/24/09	KWG0905322	
Phenanthrene	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
Anthracene	ND	U	6.1	1.6	1	06/18/09	06/24/09	KWG0905322	
Di-n-butyl Phthalate	ND	U	13	7.9	1	06/18/09	06/24/09	KWG0905322	
Fluoranthene	ND	U	6.1	1.6	1	06/18/09	06/24/09	KWG0905322	
Pyrene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Butyl Benzyl Phthalate	ND	U	6.1	3.2	1	06/18/09	06/24/09	KWG0905322	
3,3'-Dichlorobenzidine	ND	U	61	3.7	1	06/18/09	06/24/09	KWG0905322	
Benz(a)anthracene	ND	U	6.1	1.7	1	06/18/09	06/24/09	KWG0905322	
Chrysene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Bis(2-ethylhexyl) Phthalate	7.6	J	61	7.0	1	06/18/09	06/24/09	KWG0905322	
Di-n-octyl Phthalate	ND	U	6.1	1.7	1	06/18/09	06/24/09	KWG0905322	
Benzo(b)fluoranthene	ND	U	6.1	1.2	1	06/18/09	06/24/09	KWG0905322	
Benzo(k)fluoranthene	ND	U	6.1	1.4	1	06/18/09	06/24/09	KWG0905322	
Benzo(a)pyrene	ND	U	6.1	1.7	1	06/18/09	06/24/09	KWG0905322	
Indeno(1,2,3-cd)pyrene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Dibenz(a,h)anthracene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	
Benzo(g,h,i)perylene	ND	U	6.1	1.5	1	06/18/09	06/24/09	KWG0905322	

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG0905322-3

Units: ug/Kg
Basis: Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	39	11-80	06/24/09	Acceptable
Phenol-d6	66	20-86	06/24/09	Acceptable
Nitrobenzene-d5	90	27-91	06/24/09	Acceptable
2-Fluorobiphenyl	80	25-97	06/24/09	Acceptable
2,4,6-Tribromophenol	93	10-119	06/24/09	Acceptable
Terphenyl-d14	111	33-129	06/24/09	Acceptable

† Analyte Comments

4-Methylphenol This analyte cannot be separated from 3-Methylphenol.

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065

Surrogate Recovery Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>	<u>Sur3</u>	<u>Sur4</u>	<u>Sur5</u>	<u>Sur6</u>
FO 095671	K0905065-001	20	37	60	56	36	77
FO 095672	K0905065-002	18	34	67	63	46	104
Method Blank	KWG0904879-5	50	52	48	47	61	70
Method Blank	KWG0905322-3	39	66	90	80	93	111
Batch QC	K0905086-001	42	42	42	42	72	61
Batch QCMS	KWG0904879-1	46	47	47	47	84	71
Batch QCDMS	KWG0904879-2	47	46	47	45	74	61
Lab Control Sample	KWG0904879-3	50	53	50	47	68	68
Duplicate Lab Control Sample	KWG0904879-4	43	46	41	42	59	64
Lab Control Sample	KWG0905322-1	47	57	77	67	79	96
Duplicate Lab Control Sample	KWG0905322-2	41	54	72	65	71	82

Surrogate Recovery Control Limits (%)

Sur1 = 2-Fluorophenol	11-80	Sur5 = 2,4,6-Tribromophenol	10-119
Sur2 = Phenol-d6	20-86	Sur6 = Terphenyl-d14	33-129
Sur3 = Nitrobenzene-d5	27-91		
Sur4 = 2-Fluorobiphenyl	25-97		

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Extracted: 06/08/2009
Date Analyzed: 06/16/2009

Matrix Spike/Duplicate Matrix Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Sample Name: Batch QC
Lab Code: K0905086-001
Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0904879

Analyte Name	Sample Result	Batch QCMS KWG0904879-1 Matrix Spike			Batch QCDMS KWG0904879-2 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Phenol	ND	71.1	132	54	66.4	132	50	15-98	7	40
2-Chlorophenol	ND	69.4	132	52	62.0	132	47	19-92	11	40
1,4-Dichlorobenzene	ND	67.3	132	51	66.4	132	50	11-88	1	40
N-Nitrosodi-n-propylamine	ND	67.2	132	51	66.2	132	50	14-104	2	40
1,2,4-Trichlorobenzene	ND	71.6	132	54	65.9	132	50	18-91	8	40
4-Chloro-3-methylphenol	ND	86.4	132	65	75.9	132	57	12-106	13	40
Acenaphthene	ND	77.2	132	58	70.2	132	53	21-104	10	40
4-Nitrophenol	ND	125	132	95	102	132	77	11-131	21	40
2,4-Dinitrotoluene	ND	96.1	132	73	83.6	132	63	25-114	14	40
Pentachlorophenol	ND	102	132	77	100	132	76	10-123	1	40
Pyrene	1.8	94.0	132	70	79.9	132	59	17-129	16	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Extracted: 06/08/2009
Date Analyzed: 06/12/2009

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0904879

Analyte Name	Lab Control Sample KWG0904879-3 Lab Control Spike			Duplicate Lab Control Sample KWG0904879-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Bis(2-chloroethyl) Ether	127	250	51	119	250	48	29-86	6	40
Phenol	129	250	51	117	250	47	28-91	9	40
2-Chlorophenol	129	250	52	115	250	46	31-83	11	40
1,3-Dichlorobenzene	127	250	51	120	250	48	27-82	6	40
1,4-Dichlorobenzene	128	250	51	117	250	47	27-82	9	40
1,2-Dichlorobenzene	131	250	52	118	250	47	29-83	10	40
Benzyl Alcohol	135	250	54	128	250	51	27-88	5	40
Bis(2-chloroisopropyl) Ether	127	250	51	116	250	46	23-88	9	40
2-Methylphenol	118	250	47	114	250	46	14-79	3	40
Hexachloroethane	134	250	54	125	250	50	25-84	7	40
N-Nitrosodi-n-propylamine	138	250	55	121	250	49	24-89	13	40
4-Methylphenol	129	250	51	118	250	47	14-82	8	40
Nitrobenzene	132	250	53	126	250	50	29-87	5	40
Isophorone	129	250	52	132	250	53	33-83	2	40
2-Nitrophenol	131	250	52	126	250	51	33-89	4	40
2,4-Dimethylphenol	70.9	250	28	96.8	250	39	10-63	31	40
Bis(2-chloroethoxy)methane	132	250	53	124	250	49	33-85	7	40
2,4-Dichlorophenol	121	250	48	122	250	49	33-83	1	40
Benzoic Acid	ND	750	0 *	ND	750	0 *	10-48		40
1,2,4-Trichlorobenzene	124	250	50	125	250	50	31-83	1	40
Naphthalene	128	250	51	126	250	51	32-84	1	40
4-Chloroaniline	127	250	51	127	250	51	19-78	0	40
Hexachlorobutadiene	127	250	51	123	250	49	28-87	3	40
4-Chloro-3-methylphenol	131	250	53	128	250	51	28-87	3	40
2-Methylnaphthalene	126	250	50	128	250	51	33-85	1	40
Hexachlorocyclopentadiene	123	250	49	122	250	49	10-66	1	40
2,4,6-Trichlorophenol	139	250	56	132	250	53	31-86	5	40
2,4,5-Trichlorophenol	142	250	57	135	250	54	34-89	5	40
2-Chloronaphthalene	135	250	54	125	250	50	31-86	8	40
2-Nitroaniline	142	250	57	142	250	57	32-97	1	40
Acenaphthylene	152	250	61	142	250	57	33-87	7	40
Dimethyl Phthalate	152	250	61	143	250	57	38-91	6	40
2,6-Dinitrotoluene	158	250	63	141	250	57	36-94	11	40
Acenaphthene	137	250	55	131	250	52	35-83	4	40
3-Nitroaniline	153	250	61	142	250	57	31-91	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Misc. solid

Service Request: K0905065
Date Extracted: 06/08/2009
Date Analyzed: 06/12/2009

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0904879

Analyte Name	Lab Control Sample KWG0904879-3 Lab Control Spike			Duplicate Lab Control Sample KWG0904879-4 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
2,4-Dinitrophenol	129	250	52	118	250	47	10-100	9	40
Dibenzofuran	137	250	55	131	250	52	35-85	5	40
4-Nitrophenol	167	250	67	162	250	65	32-110	3	40
2,4-Dinitrotoluene	166	250	66	161	250	64	40-98	3	40
Fluorene	146	250	58	135	250	54	36-87	7	40
4-Chlorophenyl Phenyl Ether	144	250	58	140	250	56	34-87	3	40
Diethyl Phthalate	159	250	63	159	250	64	39-98	0	40
4-Nitroaniline	162	250	65	165	250	66	33-99	2	40
2-Methyl-4,6-dinitrophenol	153	250	61	158	250	63	27-102	3	40
N-Nitrosodiphenylamine	149	250	60	148	250	59	29-92	1	40
4-Bromophenyl Phenyl Ether	154	250	61	143	250	57	38-90	7	40
Hexachlorobenzene	155	250	62	148	250	59	39-90	5	40
Pentachlorophenol	134	250	53	153	250	61	21-97	14	40
Phenanthrene	164	250	66	155	250	62	41-90	6	40
Anthracene	159	250	64	156	250	62	35-93	2	40
Di-n-butyl Phthalate	168	250	67	173	250	69	40-116	2	40
Fluoranthene	171	250	68	177	250	71	42-103	4	40
Pyrene	167	250	67	171	250	68	42-105	2	40
Butyl Benzyl Phthalate	170	250	68	173	250	69	41-114	2	40
3,3'-Dichlorobenzidine	146	250	59	169	250	67	13-98	14	40
Benz(a)anthracene	166	250	66	173	250	69	43-104	4	40
Chrysene	174	250	70	177	250	71	47-104	2	40
Bis(2-ethylhexyl) Phthalate	167	250	67	170	250	68	40-122	2	40
Di-n-octyl Phthalate	172	250	69	172	250	69	43-119	0	40
Benzo(b)fluoranthene	168	250	67	174	250	69	45-106	3	40
Benzo(k)fluoranthene	168	250	67	173	250	69	47-105	3	40
Benzo(a)pyrene	148	250	59	151	250	60	35-109	2	40
Indeno(1,2,3-cd)pyrene	170	250	68	173	250	69	43-111	2	40
Dibenz(a,h)anthracene	164	250	66	170	250	68	44-110	4	40
Benzo(g,h,i)perylene	166	250	67	170	250	68	38-108	2	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Extracted: 06/18/2009
Date Analyzed: 06/24/2009

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905322

Analyte Name	Lab Control Sample KWG0905322-1 Lab Control Spike			Duplicate Lab Control Sample KWG0905322-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
Bis(2-chloroethyl) Ether	120	250	48	127	250	51	29-86	6	40
Phenol	139	250	56	140	250	56	28-91	1	40
2-Chlorophenol	138	250	55	123	250	49	31-83	12	40
1,3-Dichlorobenzene	126	250	50	115	250	46	27-82	9	40
1,4-Dichlorobenzene	121	250	48	118	250	47	27-82	2	40
1,2-Dichlorobenzene	128	250	51	121	250	48	29-83	6	40
Benzyl Alcohol	121	250	48	121	250	48	27-88	0	40
Bis(2-chloroisopropyl) Ether	118	250	47	118	250	47	23-88	1	40
2-Methylphenol	109	250	44	111	250	44	14-79	1	40
Hexachloroethane	160	250	64	143	250	57	25-84	11	40
N-Nitrosodi-n-propylamine	142	250	57	138	250	55	24-89	3	40
4-Methylphenol	122	250	49	111	250	44	14-82	10	40
Nitrobenzene	156	250	62	146	250	58	29-87	7	40
Isophorone	142	250	57	139	250	56	33-83	3	40
2-Nitrophenol	140	250	56	136	250	54	33-89	3	40
2,4-Dimethylphenol	55.8	250	22	38.1	250	15	10-63	38	40
Bis(2-chloroethoxy)methane	132	250	53	133	250	53	33-85	0	40
2,4-Dichlorophenol	132	250	53	126	250	50	33-83	5	40
Benzoic Acid	211	750	28	199	750	27	10-48	6	40
1,2,4-Trichlorobenzene	131	250	52	121	250	48	31-83	8	40
Naphthalene	136	250	54	131	250	52	32-84	4	40
4-Chloroaniline	122	250	49	119	250	47	19-78	3	40
Hexachlorobutadiene	147	250	59	149	250	60	28-87	1	40
4-Chloro-3-methylphenol	141	250	56	137	250	55	28-87	2	40
2-Methylnaphthalene	132	250	53	132	250	53	33-85	0	40
Hexachlorocyclopentadiene	167	250	67 *	166	250	67 *	10-66	0	40
2,4,6-Trichlorophenol	144	250	57	146	250	58	31-86	2	40
2,4,5-Trichlorophenol	148	250	59	150	250	60	34-89	1	40
2-Chloronaphthalene	160	250	64	158	250	63	31-86	2	40
2-Nitroaniline	184	250	74	184	250	73	32-97	0	40
Acenaphthylene	155	250	62	156	250	62	33-87	0	40
Dimethyl Phthalate	167	250	67	159	250	64	38-91	5	40
2,6-Dinitrotoluene	150	250	60	154	250	62	36-94	3	40
Acenaphthene	140	250	56	144	250	58	35-83	3	40
3-Nitroaniline	150	250	60	158	250	63	31-91	5	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Portland, City of
Project: Portland Harbor Inline Samp
Sample Matrix: Sludge, solid

Service Request: K0905065
Date Extracted: 06/18/2009
Date Analyzed: 06/24/2009

**Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS**

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0905322

Analyte Name	Lab Control Sample KWG0905322-1 Lab Control Spike			Duplicate Lab Control Sample KWG0905322-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Expected	%Rec	Result	Expected	%Rec			
2,4-Dinitrophenol	144	250	58	145	250	58	10-100	1	40
Dibenzofuran	142	250	57	142	250	57	35-85	0	40
4-Nitrophenol	260	250	104	239	250	96	32-110	8	40
2,4-Dinitrotoluene	182	250	73	174	250	70	40-98	4	40
Fluorene	147	250	59	145	250	58	36-87	1	40
4-Chlorophenyl Phenyl Ether	149	250	60	148	250	59	34-87	1	40
Diethyl Phthalate	186	250	74	172	250	69	39-98	8	40
4-Nitroaniline	170	250	68	159	250	64	33-99	7	40
2-Methyl-4,6-dinitrophenol	175	250	70	169	250	68	27-102	3	40
N-Nitrosodiphenylamine	148	250	59	141	250	56	29-92	6	40
4-Bromophenyl Phenyl Ether	159	250	64	157	250	63	38-90	1	40
Hexachlorobenzene	166	250	66	160	250	64	39-90	4	40
Pentachlorophenol	174	250	69	151	250	60	21-97	14	40
Phenanthrene	158	250	63	145	250	58	41-90	9	40
Anthracene	152	250	61	144	250	58	35-93	6	40
Di-n-butyl Phthalate	192	250	77	168	250	67	40-116	13	40
Fluoranthene	177	250	71	154	250	62	42-103	14	40
Pyrene	165	250	66	143	250	57	42-105	14	40
Butyl Benzyl Phthalate	185	250	74	158	250	63	41-114	15	40
3,3'-Dichlorobenzidine	151	250	61	123	250	49	13-98	20	40
Benz(a)anthracene	174	250	70	151	250	60	43-104	14	40
Chrysene	177	250	71	153	250	61	47-104	15	40
Bis(2-ethylhexyl) Phthalate	187	250	75	159	250	64	40-122	16	40
Di-n-octyl Phthalate	180	250	72	159	250	64	43-119	12	40
Benzo(b)fluoranthene	169	250	68	152	250	61	45-106	11	40
Benzo(k)fluoranthene	176	250	70	158	250	63	47-105	11	40
Benzo(a)pyrene	148	250	59	133	250	53	35-109	11	40
Indeno(1,2,3-cd)pyrene	174	250	69	151	250	60	43-111	14	40
Dibenz(a,h)anthracene	172	250	69	150	250	60	44-110	13	40
Benzo(g,h,i)perylene	163	250	65	146	250	58	38-108	11	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

July 29, 2009

Jennifer Shackelford
City of Portland Water Pollution Laboratory
6543 N. Burlington Ave.
Portland, OR 97203

RE: Portland Harbor

Enclosed are the results of analyses for samples received by the laboratory on 06/05/09 09:20.
The following list is a summary of the Work Orders contained in this report, generated on 07/29/09 14:55.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
PSF0201	Portland Harbor	36238

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/29/09 14:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO095671	PSF0201-01	Soil	06/04/09 11:45	06/05/09 09:20
FO095672	PSF0201-02	Soil	06/04/09 12:52	06/05/09 09:20

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/29/09 14:55

Chlorinated Herbicides per EPA Method 8151A Modified

TestAmerica Portland

Analyte	Method	Result	MDL *	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PSF0201-01RE1 (FO095671)		Soil		Sampled: 06/04/09 11:45						
2,4-D	8151mod	22.7	3.43	31.3	ug/kg dry	1x	9060702	06/18/09 14:57	06/23/09 22:06	B, J
2,4-DB	"	ND	5.63	31.3	"	"	"	"	"	C
2,4,5-T	"	8.55	4.64	31.3	"	"	"	"	"	B, C, J
2,4,5-TP (Silvex)	"	ND	3.31	31.3	"	"	"	"	"	
Dalapon	"	ND	7.07	31.3	"	"	"	"	"	C
Dicamba	"	ND	3.64	31.3	"	"	"	"	"	C
Dichlorprop	"	ND	3.01	31.3	"	"	"	"	"	
Dinoseb	"	ND	5.31	31.3	"	"	"	"	"	C
MCPA	"	ND	251	3130	"	"	"	"	"	
MCPD	"	ND	255	3130	"	"	"	"	"	
<hr/>										
Surrogate(s): 2,4-Dichlorophenylacetic acid				106%		30 - 140 %	"		"	C

PSF0201-02RE1 (FO095672)		Soil		Sampled: 06/04/09 12:52						
2,4-D	8151mod	1790	33.1	303	ug/kg dry	10x	9060702	06/18/09 14:57	06/24/09 11:59	B
2,4-DB	"	ND	5.43	30.3	"	1x	"	"	06/23/09 22:45	C
2,4,5-T	"	7.66	4.48	30.3	"	"	"	"	"	B, C, J
2,4,5-TP (Silvex)	"	ND	3.19	30.3	"	"	"	"	"	
Dalapon	"	ND	6.82	30.3	"	"	"	"	"	C
Dicamba	"	ND	3.51	30.3	"	"	"	"	"	C
Dichlorprop	"	ND	2.90	30.3	"	"	"	"	"	
Dinoseb	"	ND	5.13	30.3	"	"	"	"	"	C
MCPA	"	ND	242	3030	"	"	"	"	"	
MCPD	"	ND	247	3030	"	"	"	"	"	
<hr/>										
Surrogate(s): 2,4-Dichlorophenylacetic acid				112%		30 - 140 %	"		"	C

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/29/09 14:55

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9060702

Soil Preparation Method: EPA 3510/600 Series

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (9060702-BLK1)							Extracted: 06/18/09 14:57							
2,4-D	8151mod	14.7	2.19	20.0	ug/kg wet	1x	--	--	--	--	--	--	06/23/09 20:09	B, J
2,4-DB	"	ND	3.59	20.0	"	"	--	--	--	--	--	--	"	C
2,4,5-T	"	13.1	2.96	20.0	"	"	--	--	--	--	--	--	"	B, C, J
2,4,5-TP (Silvex)	"	ND	2.11	20.0	"	"	--	--	--	--	--	--	"	
Dalapon	"	ND	4.51	20.0	"	"	--	--	--	--	--	--	"	
Dicamba	"	ND	2.32	20.0	"	"	--	--	--	--	--	--	"	
Dichlorprop	"	ND	1.92	20.0	"	"	--	--	--	--	--	--	"	
Dinoseb	"	ND	3.39	20.0	"	"	--	--	--	--	--	--	"	C
MCPA	"	ND	160	2000	"	"	--	--	--	--	--	--	"	
MCPP	"	ND	163	2000	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid Recovery: 107% Limits: 30-140% " 06/23/09 20:09														

LCS (9060702-BS1)

Extracted: 06/18/09 14:57

2,4-D	8151mod	55.7	2.19	20.0	ug/kg wet	1x	--	80.0	69.6%	(30-120)	--	--	06/23/09 20:48	B
2,4-DB	"	52.1	3.59	20.0	"	"	--	"	65.2%	(30-130)	--	--	"	C8
2,4,5-T	"	48.0	2.96	20.0	"	"	--	"	60.0%	(25-125)	--	--	"	B, C8
2,4,5-TP (Silvex)	"	38.8	2.11	20.0	"	"	--	"	48.5%	(35-100)	--	--	"	
Dalapon	"	32.8	4.51	20.0	"	"	--	"	41.0%	(20-110)	--	--	"	
Dicamba	"	45.1	2.32	20.0	"	"	--	"	56.4%	(30-115)	--	--	"	
Dichlorprop	"	46.0	1.92	20.0	"	"	--	"	57.5%	(50-100)	--	--	"	
Dinoseb	"	41.6	3.39	20.0	"	"	--	"	52.0%	(10-130)	--	--	"	C8
MCPA	"	4590	160	2000	"	"	--	8000	57.4%	(30-105)	--	--	"	
MCPP	"	5500	163	2000	"	"	--	"	68.7%	(15-115)	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid Recovery: 72.1% Limits: 45-125% " 06/23/09 20:48														

Matrix Spike (9060702-MS1)

QC Source: PSF0201-01RE1

Extracted: 06/18/09 14:57

2,4-D	8151mod	131	3.43	31.3	ug/kg dry	1x	22.7	125	86.6%	(15-110)	--	--	06/23/09 23:26	B
2,4-DB	"	106	5.63	31.3	"	"	ND	"	84.5%	(10-135)	--	--	"	C8
2,4,5-T	"	111	4.64	31.3	"	"	8.55	"	81.7%	(15-120)	--	--	"	B, C8
2,4,5-TP (Silvex)	"	84.9	3.31	31.3	"	"	ND	"	67.7%	(20-105)	--	--	"	
Dalapon	"	109	7.07	31.3	"	"	ND	"	87.1%	(15-105)	--	--	"	C8
Dicamba	"	95.9	3.64	31.3	"	"	ND	"	76.5%	"	--	--	"	C8
Dichlorprop	"	103	3.01	31.3	"	"	ND	"	82.4%	(25-105)	--	--	"	
Dinoseb	"	83.7	5.31	31.3	"	"	ND	"	66.7%	(15-125)	--	--	"	C8
MCPA	"	10900	251	3130	"	"	ND	12500	87.1%	(15-105)	--	--	"	
MCPP	"	12800	255	3130	"	"	ND	"	102%	(15-110)	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid Recovery: 103% Limits: 20-125% " 06/23/09 23:26 C8														

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
07/29/09 14:55

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

TestAmerica Portland

QC Batch: 9060702

Soil Preparation Method: EPA 3510/600 Series

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (9060702-MSD1)			QC Source: PSF0201-01RE1					Extracted: 06/18/09 14:57						
2,4-D	8151mod	51.9	3.43	31.3	ug/kg dry	1x	22.7	125	23.2%	(15-110)	86.8%	(30)	06/24/09 08:04	B, R
2,4-DB	"	44.3	5.63	31.3	"	"	ND	"	35.3%	(10-135)	82.0%	(40)	"	R, C8
2,4,5-T	"	44.9	4.64	31.3	"	"	8.55	"	29.0%	(15-120)	84.9%	"	"	B, R, C8
2,4,5-TP (Silvex)	"	26.5	3.31	31.3	"	"	ND	"	21.2%	(20-105)	105%	"	"	R, J
Dalapon	"	67.2	7.07	31.3	"	"	ND	"	53.6%	(15-105)	47.6%	"	"	R, C8
Dicamba	"	38.3	3.64	31.3	"	"	ND	"	30.5%	"	85.9%	"	"	R, C8
Dichlorprop	"	46.9	3.01	31.3	"	"	ND	"	37.4%	(25-105)	75.1%	"	"	R
Dinoseb	"	35.2	5.31	31.3	"	"	ND	"	28.1%	(15-125)	81.5%	"	"	R, C8
MCPA	"	4980	251	3130	"	"	ND	12500	39.7%	(15-105)	74.8%	"	"	R
MCPD	"	6170	255	3130	"	"	ND	"	49.2%	(15-110)	69.6%	"	"	R
Surrogate(s): 2,4-Dichlorophenylacetic acid Recovery: 60.9% Limits: 20-125% " 06/24/09 08:04 C8														

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

07/29/09 14:55

Notes and Definitions

Report Specific Notes:

- B - Analyte was detected in the associated Method Blank.
- C - Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted.
- C8 - Calibration Verification recovery was above the method control limit for this analyte. A high bias may be indicated.
- J - Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.
- R - The RPD exceeded the method control limit due to sample matrix effects. The individual analyte QA/QC recoveries, however, were within acceptance limits.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

Work Order #: PSF0201

* Please use customized MC analytic list. Thanks

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PSFO201 Date/Time Received: 6/5/09 920
Client Name and Project: City of Portland
Portland Harbor

PM to Complete This Section: Yes No
Residual Chlorine Check Required: ☐ ☐ Quarantined: ☐ ☐
Quote #:
Special Instructions:

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☐ PDT/PST ☐ OTHER

Unpacking Checks:

Cooler #(s): 5, 6
Temperatures: 5.6
Digi #1 ☐ Digi #2 ☐ IR Gun ☒
☐ Plastic ☒ Glass

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
Other: _____

N/A Yes No

Initials: jm

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD.
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☒ ☐ ☐ 6. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 7. pH of all samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 9. HF Dilution required?
- ☒ ☐ ☐ 10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 11. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 12. Were VOA/Oil Syringe samples without headspace?
- ☒ ☐ ☐ 13. Were VOA vials preserved? ☐ HCL ☐ Sodium Thiosulfate ☐ Ascorbic Acid
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 17. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
- ☒ ☐ ☐ 18. Are analyses with short holding times received in hold?
- ☒ ☐ ☐ 19. Was Standard Turn Around (TAT) requested?
- ☒ ☐ ☐ 20. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PSF0201

Login Checks:

Initials: BDE

N/A Yes No

- ☒ ☐ 21. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
- ☒ ☐ 22. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
- ☒ ☐ 23. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
- ☐ ☒ 24. Were special log in instructions read and followed?
- ☐ ☒ 25. Were tests logged checked against the COC?
- ☒ ☐ 26. Were rush notices printed and delivered?
- ☒ ☐ 27. Were short hold notices printed and delivered?
- ☐ ☒ 28. Were subcontract COCs printed?
- ☒ ☐ 29. Was HF dilution logged?

Labeling and Storage Checks:

Initials: mm

N/A Yes No

- ☐ ☒ 30. Were the subcontracted samples/containers put in Sx fridge?
- ☒ ☐ 31. Were sample bottles and COC double checked for dissolved/filtered metals?
- ☒ ☐ 32. Did the sample ID, Date, and Time from label match what was logged?
- ☒ ☐ 33. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
- ☒ ☐ 34. Were HF stickers affixed to each container, and containers stored in Sx fridge?
- ☒ ☐ 35. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

Printed on recycled paper.