Final Porewater Characterization Report

River Mile 11 East

Willamette River
Portland, Oregon

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Prepared for

RM11E GROUP

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Abbreviations and Acronyms

µg/kg	microgram(s) per kilogram
µL	microliters
µm	micron
AC	activated carbon
ALS	ALS Environmental
AOPC	Area of Potential Concern
BMC	Ballard Marine Construction
bml	below mudline
^{0}C	degrees Celsius
Cargill	Cargill, Inc.
CHN	carbon, hydrogen, nitrogen
City	City of Portland
cm	centimeters
COC	chain of custody
DCM	dichloromethane
dGPS	differential global positioning system
DM	Data Manager
DOF	Dalton, Olmsted & Fuglevand, Inc.
DVR	data validation report
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
FD	Field Director
FS	feasibility study
Glacier NW	Glacier Northwest, Inc.
GSI	GSI Water Solutions, Inc.
HOC	hydrophobic organic compound
HRGC	high-resolution capillary chromatography
HRMS	high-resolution mass spectrometry
LRMS	low-resolution mass spectrometry
LWG	Lower Willamette Group
MDL	method detection limit
MeOH	methanol
MIT	Massachusetts Institute of Technology
MS	Microsoft
NAD83	North American Datum of 1983

NAVD88	North American Vertical Datum of 1988
ng/L	nanograms per liter
OC	organic carbon
PCB	polychlorinated biphenyl
PE	polyethylene
PED	polyethylene device
Portland Harbor	Portland Harbor Superfund Site
PRC	performance reference compounds
PRG	Preliminary Remediation Goal
Pyron	Pyron Environmental, LLC
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	quality control
RA	risk assessment
RI	remedial investigation
RI/FS	remedial investigation and feasibility study
RM	river mile
RM11E	River Mile 11 East
RM11E Group	Cargill, Inc.; CBS Corporation; City of Portland; DIL Trust; Glacier Northwest, Inc.; and PacifiCorp
RPD	relative percent difference
SAC	Sampling and Analysis Coordinator
SAP	sampling and analysis plan
SEE	Science and Engineering for the Environment, LLC
SIM	selective ion monitoring
SOP	standard operating procedure
SOW	statement of work
TOC	total organic carbon
TS	total solids
USGS	U.S. Geological Survey
Work Plan	RM11E Supplemental Remedial Investigation and Feasibility Study Work Plan

Section 1. Introduction

This Porewater Characterization Report, prepared for the River Mile 11 East (RM11E) Project Area, is submitted by Cargill, Inc. (Cargill); CBS Corporation; City of Portland (City); DIL Trust; Glacier Northwest, Inc. (Glacier NW); and PacifiCorp, collectively referred to as the RM11E Group. This report was prepared on behalf of the RM11E Group by Science and Engineering for the Environment, LLC (SEE); Dalton, Olmstead & Fuglevand, Inc. (DOF); and GSI Water Solutions, Inc. (GSI).

This report is part of the RM11E Supplemental Remedial Investigation and Feasibility Study (Supplemental RI/FS). The Final Supplemental RI/FS Work Plan for RM11E (Work Plan; GSI and DOF, 2013) provides a detailed description of the work being conducted pursuant to the Statement of Work (SOW) contained within the Administrative Settlement Agreement and Order on Consent (Settlement Agreement) (U.S. Environmental Protection Agency [EPA] Region 10, CERCLA Docket No. 10-2013-0087). The RM11E investigation supplements the Portland Harbor Superfund Site (Portland Harbor) Draft Final Remedial Investigation Report (Draft Final RI Report; Integral et al., 2011) and the Draft Feasibility Study Report (Draft FS Report; Anchor QEA et al., 2012) to inform selection and design of a final remedy at the RM11E Project Area[1].

The RM11E Project Area is shown in Figure 1-1. The RM11E Project Area lies between approximately RM 10.9 and RM 11.6 along the east bank of the Willamette River and includes Area of Potential Concern (AOPC) 25 (from the Draft FS Report for Portland Harbor) and the riverbank area to the top of the bank.

The RM11E Group submitted a Final Porewater Sampling and Analysis Plan (SAP) to EPA in May 2014 in response to EPA's September 2013 communications requiring the performance of a passive porewater investigation as part of the Work Plan (SEE, DOF, and GSI, 2014). The field data described in this report were collected in accordance with the EPA-approved SAP, as well as with the Quality Assurance Project Plan (QAPP) Addendum submitted as Appendix A of the Supplemental RI/FS Work Plan[2].

A major observation from this study is that there were analytical challenges in the implementation at the commercial laboratory that limited the usability of the reported data from the commercial laboratory for estimating and reporting polychlorinated biphenyl (PCB) porewater concentrations.

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[1] The revised Draft FS Report for the PHSS is currently being prepared by EPA. The findings of the Final PHSS RI/FS will be incorporated during remedial design for the RM11E Project Area.

[2] The QAPP describes the quality assurance/quality control (QA/QC) procedures that were used to determine concentrations of selected chemicals in environmental media that were collected as part of the RM11E Supplemental RI/FS investigations. Modifications to QA/QC procedures used in the porewater characterization are described in the SAP.

Passive porewater sampling for hydrophobic organic compounds (HOCs), such as PCBs, is an evolving method that has recently begun to move out of the research institutes where it is still being developed. The method employed in this study uses polyethylene (PE) and reference compounds to evaluate interactions with hydrophobic contaminants of concern. To estimate porewater and surface water PCB concentrations from concentrations of PCBs measured in PE, the passive porewater method requires the ability to determine the relative state of equilibrium between the PE and the surrounding medium. This is done using performance reference compounds (PRCs), which, for this study, were PCBs 28, 47, 54, 97, 111, 153, and 178.

The passive porewater model is dependent on an expected depletion of the PRC compounds from the PE media to the contacted water (i.e., flux of PRCs from the PE into the surrounding environmental media) over the time of deployment. It is expected that compounds with higher aqueous solubility will migrate from the PE faster and there will be higher losses for the low-chlorinated PRCs (28, 47, and 54) and less or no equilibration with the higher-chlorinated PRCs (97, 111, 153, and 178). As discussed in Sections 4 and 6, for the sediment-exposed PE samples analyzed by ALS Environmental (ALS), the PRC data did not show the expected relative depletion of PRCs (i.e., equilibration), and thus are unusable for the estimation of porewater PCB concentrations from the concentrations of PCBs in the PE. Sediment-exposed PE samples from the two stations analyzed at the Massachusetts Institute of Technology (MIT) showed the expected relative equilibration for the PRCs and will be discussed further in Section 7.

In spite of the limitations noted herein, the data collected provide useful information by establishing that using standard model assumptions for estimating porewater concentrations is consistent with other sites in the peer-review literature regarding porewater and is likely to result in porewater concentrations greater than or similar to porewater concentrations estimated from sediment-exposed PE. Therefore, partitioning models can be used with available data to approximate porewater concentrations that will be usable for remedial planning, including input into sediment cap isolation models in the Recontamination Assessment Report.

1.1 Purpose and Objectives

The purpose of the work detailed in this report was to meet a specific data collection need identified in Section 2.4 of the SOW:

> *Porewater and Empirical Data to Inform Cap Design: Porewater quality, hydraulic gradients, sediment texture, and other empirical data will be collected and evaluated for input into a sediment cap isolation (advection/diffusion) model in order to inform cap design.*

Passive PE samples and adjacent sediment data in the RM11E Project Area were collected in accordance with the SAP to measure PCB concentrations in sediment and estimate porewater and surface water concentrations from sediment-exposed PE and surface water-exposed PE, respectively. Additional sediment physicochemical properties were also measured to evaluate the influence of total organic carbon (TOC) and black carbon, on predictions of partitioning behavior from sediment to porewater.

1.2 Document Content and Organization

This report is prepared in accordance with requirements set forth in Section 9.4 (Reporting) of the SAP (SEE, DOF, and GSI, 2014).

The Phase 1 Porewater Characterization, described in the Work Plan, required the evaluation of existing and new information to inform locations for porewater sampling. The Phase 1 evaluations considered potential capping locations and existing sediment data to identify locations for collection of empirical porewater data. This information was presented in Section 2 of the SAP.

As the project approach evolved following EPA approval of the Work Plan and the SAP, it became apparent that some of the information originally intended for inclusion in this Porewater Characterization Report fits more logically in the companion Recontamination Assessment and Implementability Study Reports. This includes the following information:

- All groundwater-related information will be presented in the Recontamination Assessment Report as part of the groundwater pathway evaluation. This includes groundwater flux estimates and identification of areas where contaminated groundwater may be discharging to the in-water project area, including discussion of the Tarr plume (Oregon Environmental Cleanup Site Information [ECSI] Site ID 1139).
- The sediment cap isolation model results will be presented in the Recontamination Assessment Report because the model relies on groundwater information that will be developed in the groundwater pathway evaluation in that report. That assessment will integrate the usable results from the porewater investigation, as described in this report.
- A description of physical properties that may impact cap placement will be presented in the Implementability Study Report. That report and associated appendices will describe underwater debris and pilings, geotechnical properties of the slope, navigation requirements, and over-water structures.
- Estimated porewater concentrations in the RM11E Project Area, derived from paired sediment-water partitioning coefficients from other Portland Harbor sites, will be evaluated, as necessary, for sediment cap isolation modeling in the Recontamination Assessment Report.

This report is organized into the following sections:

Section 1 – Introduction to the project and objectives.

Sections 2 and 3 – Field activities and laboratory methods used to collect and analyze the porewater investigation data, and deviations from the SAP.

Section 4 – Data validation and management procedures and discussion on data usability.

Section 5 – Bulk sediment data, re-occupied station results, and data comparison between ALS and MIT.

Section 6 – PE sample analytical data, partitioning coefficients, and estimated porewater and surface water results calculated on the basis of the PE values.

Section 7 – Compares estimated porewater data from this study with calculated porewater values from existing equilibrium partitioning models.

Section 8 – Presents limitations and uncertainties of the data.

Section 9 – Summarizes the findings of the study.

Section 10 – Lists references.

Supporting information, including field documentation, photographs, laboratory reports, the data validation report (DVR), and data calculations, is provided in Appendices A through M.

Section 2. Field Methods

The RM11E porewater characterization employed passive samplers containing inert sheets of PE that are capable of sorbing HOCs. The PCB concentrations in the PE may then be used to quantify PCB congener concentrations in porewater based on literature-based partitioning of PCBs from PE to porewater. Documentation of the method(s) selected is provided in Section 2.2 of the SAP. This section summarizes the procedures used to prepare, deploy, retrieve, and process the passive samplers and associated PE samples used to estimate PCB congener concentrations in porewater. Sediment samples were collected adjacent to the deployed passive samplers and methods for collecting those samples also are presented in this section.

Generally, the methods employed were those described in the SAP, with exceptions as discussed below. Figure 2-1 shows the proposed and actual sampling locations, while Table 2-1 provides the proposed and actual field sampling coordinates.

2.1 Field Reconnaissance Survey

A pre-deployment field reconnaissance and initial trial placement of the passive samplers equipped with PE sheets were conducted on May 2, 2014. The objective of the reconnaissance survey was to determine whether the gravel, sand, and anthropogenic materials found during the 2009 sediment grab sampling and coring field work would either prevent effective sampler insertion or, alternatively, damage the passive samplers and PE sheets during placement and retrieval.

Placement and retrieval of the passive samplers were tested at the three nearshore stations where anthropogenic debris was observed during the 2009 sampling: RM11E-PW002, RM11E-PW003, and RM11E-PW006. Successful insertion and retrieval were achieved at all three locations, with no tears or other visible stress in the PE sheets. A detailed description of the work performed is presented in Attachment 4 of the SAP. The results of the reconnaissance survey demonstrated that the methods defined in the SAP were suitable for successful deployment and retrieval of the passive samplers in the RM11E Project Area.

2.2 Passive Sampler Preparation and Installation

Six paired passive samplers and a single passive sampler at the upriver location were installed as shown in Figure 2-1 and Table 2-1. The samplers were prepared and assembled on August 17, 2014, at the ALS laboratory in Kelso, Washington, and deployed on August 18, 2014, in the RM11E Project Area.

2.2.1 Loading and Assembly of PE Samplers

PRCs were impregnated into the PE as described in Section 2.2 and in Attachment 5 of the SAP. Thirteen passive sampler PE sheets impregnated with PRCs were fixed into the sampler frame[3] the day before deployment. PRC loading and confirmation sampling at ALS are discussed further in Section 3.1 and in the Passive Sampler Loading Report (Appendix B). A brief description is provided below.

In accordance with ALS's standard operating procedure (SOP) for preparing PE passive samplers and PCB congener PRC loading (Attachment 5 of the SAP), ALS prepared 20 jars of PRCs with 15 x 70-centimeter (cm) PE sheets that are 25 micron (µm) thick. While the exposure area in the sampler frames is approximately 10 x 50 cm, a larger piece was impregnated with PRCs to fit the sampler frame and to allow for an additional 15 x 20 cm of trim to be analyzed to quantify the initial PRC loading. As further discussed in Section 3.1, PRC loading was dependent on the previous sediment Aroclor analyses at the target locations. In consultation with MIT and ALS, two levels of PRC loading were required: "high" and "low." Following MIT's SOPs for passive sampling, described in Section 3.2 of the SAP, the PRC loading level (high or low) was selected for each proposed location based on the calculated equilibrium concentration associated with the previous bulk sediment estimates. Locations with relatively higher estimated maximum porewater PCB concentrations were designated for "high" PRC loading and locations with relatively lower maximum porewater PCB concentrations were designated for "low" PRC loading (Table 2-2).

Before placing the PE sheets into the sampler frames, the following information was recorded in the field log: the sample location, sampler frame numbers, ALS PRC loading identification, and initial PRC sample identification (Table 2-3 and Appendix B). For each sampler frame, the PRC-labeled PE sheet initially was rinsed briefly with laboratory-grade deionized water to minimize potential laboratory and field exposure of field staff to the PCBs in the PRC solution. The PE sheet then was laid out across one half of the sampler frame and trimmed to the frame. The approximately 15 x 20-cm trim piece was placed into a labeled sample jar for analysis of the initial PRC loading or "time zero" (T_0). The second half of the sampler frame was placed over top, and then the two frame pieces were fastened together using stainless-steel nuts, washers, and bolts. The assembled sampler frames were then double-wrapped in aluminum foil, fixed with a station label, wrapped in plastic to minimize evaporative loss, and placed in an ice chest with ice for holding and transport to the field.

For each station, the assembled passive samplers were marked with either an "A" or "B" designation (e.g., RM11E-PW001 A). "A" samples were intended for analysis, while "B" samples served as the backup and/or archived samples.

2.2.2 Deployment of PE Samplers at RM11E

Sampling locations for the passive samplers include six onsite RM11E locations and one upriver location, as shown in Figure 1-1. Consistent with the SAP, the samplers were deployed during a period of low Willamette River stage (Figure 2-2). For the period of PE exposure, the river stage

[3] A sampler frame consists of two pieces of cut aluminum that are bolted together. Each piece of the sampler frame has a unique number etched into the head.

was below the mean high water mark, and generally at or below an elevation of 11 feet North American Vertical Datum of 1988 (NAVD88).

The passive samplers were installed at RM11E by Ballard Marine Construction (BMC) divers (BMC, 2014) under the direction of GSI and SEE on August 18, 2014. The installation followed the procedures listed in the SAP, with exceptions as noted below. A detailed description of the passive sampler installation is provided in Appendix C, which also includes video clips of the installation process and anchoring system, where underwater visibility permitted. A complete set of the diver camera videos is available in the project files.

Deployment of the passive samplers followed the procedures listed in the SOP for *Diver-Placement and Retrieval of Passive Samplers and Co-located Sediment Samples*, which is Attachment 4 to the SAP. Generally, the process at each station was to:

- Locate the target coordinates using the Trimble GeoXH – GeoExplorer 2008 Series – differential global positioning system (dGPS). Two dGPS units were on board the sampling vessel and used to confirm the target coordinates.
- Drop an anchor with a tether line as close as practicable on the target coordinates, and measure the depth with a lead line. Exceptions to this step were for stations RM11E-PW001 and RM11E-PW006, which are discussed below in more detail.
- Confirm the actual sampler deployment location with the diver positioned at the anchor point. Confirmation was made in consultation with GSI and SEE via the diver helmet camera (dive cam) and voice communications.
- Place the passive samplers in the drive frames and insert the stainless-steel protective covers over the PE sheeting as described in Attachment 4 to the SAP.
- Deploy two passive samplers at each sampling location approximately 8 inches apart (two fist widths). The offshore passive sampler was designated as the "A" sampler; the shoreward passive sampler was designated as the "B" sampler. Divers drove the samplers to the target depth of 30 cm below mudline (bml), leaving 20 cm of the PE sheet extending above the mudline in the overlying surface water.
- Anchor the samplers to adjacent pilings by rope (RM11E-PW002 and RM11E-PW006) or screw anchors (RM11E-PW001, RM11E-PW003, RM11E-PW004, RM11E-PW005, and RM11E-PW007). Where screw anchors were required, a pinger (underwater locator beacon) was attached to one of the two samplers.
- Remove the protective stainless-steel plate covers after the samplers were driven into place, after which the diver returned to the surface.

Sample locations were established by dGPS, using the standard projection system of North American Datum of 1983 (NAD83). During placement, the coordinates were recorded as latitude and longitude, but were subsequently converted to the Oregon North Zone State Plane Coordinate System for map projection. Target and actual deployment locations are presented in Table 2-1.

Vertical positioning was established using either a lead line or the pneumofathometer attached to the diver (see Table 2-1). When the diver was at depth at the sampling location, the dive supervisor instructed the diver to hold position, applied air to the hose, and the differential pressure was read through the on-board manifold gauge. The pressure readings then were converted into depth readings using standard pressure/depth correction tables. As required by Association of Diving Contractors International standards, BMC calibrates all of its gauges every 6 months, and retains certification documents. Where the sample location was accessible from the sampling platform, a lead line measurement also was taken for comparison.

Site physical conditions required the following variances to the procedures described in the SAP:

- **RM11E-PW001.** Target coordinates for RM11E-PW001 were located underneath a docked commercial vessel at the Glacier NW dock, approximately 15 feet under the outboard hull. Dive safety protocol required that the diver not go under the commercial vessel, so it was necessary to relocate as close as safely practicable to the target location. Identifying an alternate nearby location was impeded further because it was not possible to get a good satellite reading for the dGPS when the sampling vessel was next to the commercial vessel. This required moving offshore of the commercial vessel until accurate satellite coverage could be obtained. Using the navigation function, it was determined that, by moving the station location approximately 15 feet offshore of the target station, the diver would not be under the commercial vessel.

- **RM11E-PW006**. The target sample location fell within the nearshore piling field downriver of the Cargill dock. The presence of the pilings combined with the low river stage prohibited access of the sampling vessel to the sampling station. The dGPS indicated the target location was 15 feet shoreward of the coordinates recorded at the sampling vessel. The diver then moved approximately 15 feet shoreward from the sampling vessel to deploy the passive sampling device near the target station. The samplers were anchored to the pilings; a pinger was not necessary.

- **RM11E-PW007.** The upstream reference location RM11E-PW007 posed several challenges, and ultimately required requesting a field change from EPA. It was not possible to drive the sampler into the rock/cobble substrate at the target coordinates. Even after sustained driving with the installation hammer, the maximum penetration was approximately 10 cm. In an effort to identify a sediment location where the samplers could be placed, the diver was instructed to proceed first toward the shoreline up to 30 feet, and then in an arc around the target location to determine whether there was a sediment location where the samplers could be driven. After approximately 25 minutes, no sediment was identified; all substrate was the same as was observed at the target coordinates. At that point, SEE and GSI elected to call EPA to discuss potential alternatives. The result of the discussion with EPA is documented in the Field Change Request form dated August 21, 2014; the approved request is included in Appendix A.

  The upstream reference station was intended to provide a measure of the PCB levels in surface water. Accordingly, in consultation with EPA, it was determined that there was still utility in having those data, even though a co-located sediment sample would not be feasible to obtain in this area. The diver was re-deployed at the target coordinates to make one more attempt to drive the sampler at the target location. Driving with the

hammer assembly again was unsuccessful. The diver then was instructed to remove rocks to create a void in the riverbed for sampler installation. The diver was able to create a hole approximately 8 inches deep (20 cm of the target 30 cm). The rocks/gravel were then pushed back into the hole around the sampler. Because the diver was approaching his dive time limit, only one sampler with two anchor points and a pinger was placed.

Also at this location, the diver did not return to the surface with the stainless-steel, protective sampler covers. The diver indicated he had lost the sampler covers, however, the covers were still in place when the RM11E-PW007 sampler was retrieved 68 days later. This deviation from the SAP is discussed in the following section.

2.3 Passive Sampler Retrieval and Sediment Sample Collection

Passive samplers were retrieved and adjacent sediment samples were collected on October 20, 2014, 68 days after deployment. All samples remained on ice in the custody of the Field Director (FD), and were transported to ALS for processing on October 21, 2014. A detailed description of the passive sampler retrieval and sediment sample collection is provided in Appendix D.

The diver team navigated using the dGPS to each station location and anchored the dive vessel. For stations RM11E-PW002 and RM11E-PW006, the diver descended along the pilings to which the passive sampler had been tied. For the remaining stations, passive samplers were located successfully using a hand-held pinger (Benthos DPL-275).

Except as noted below for RM11E-PW002 and RM11E-PW007, the process for collecting the passive samplers and sediment cores was as follows:

- The diver first reported the approximate measure from the top of the passive sampler to the mudline. That measure was rerecorded by the FD in the field log.
- The diver cut the lines to the anchor points, retaining all rope for return to the surface.
- The sediment core sampler was lowered to the diver and positioned between passive sampler "A" and passive sampler "B." The sediment core was driven into place after removal of the passive samplers. This change to the SOP occurred due to concern in the field that driving the core tubes might damage the PE in the passive sampler. Based upon observations made by viewing the diver camera during the pulling of the PE samplers at RM11E-PW002 (see below), the net disturbance to the sediment at the time of collection was negligible and not likely to impact the bulk sediment sampling results. This was later confirmed during sediment core sample processing (see Section 2.5 and Appendix E).
- The passive samplers were removed and transported to the surface. On board the sampling vessel, the sampling devices (frames and PE) were photographed, and large particles were removed from the frame with a dry Kimwipe®, (Attachment 3 of the SAP) labeled, wrapped in foil, and placed in an ice chest with ice for transport to ALS.
- The diver then proceeded to drive the sediment core tube into the sediment. While 30 cm was the target depth, the diver was instructed to drive to the full core tube length of

approximately 80 cm. The core tube was pulled from the sediment, and lifted to the surface where the recovered depth of the sediment core was measured.

- The diver remained on the bottom of the river until the appropriate amount of sediment collected was confirmed. Sufficient amounts of sediment were obtained at all stations, except RM11E-PW001, where a second collection, adjacent to the first, was needed to obtain sufficient material.
- Upon confirmation of sufficient sediment sample collection, the cores were removed from the drive hammer, capped, sealed with duct tape, and labeled. Core tubes were stored vertically and on ice for transport to ALS.

The following exceptions are noted:

- At station RM11E-PW002, the diver removed the passive samplers before positioning the sediment sampler. This was the first station collected. This was noted and corrected for all subsequent stations. The purpose of positioning the sediment sampler before removal of the passive samplers was to ensure that the sediment core was collected between the two passive samplers. Any effect to data integrity would be that the sediment sampler was not exactly positioned between the passive samplers, but somewhat offset. Given that the diver indicated he was able to maintain the sampling position, it is not likely that this will have any significant effect on data quality.
- Collecting a sediment sample was not possible at upriver station RM11E-PW007. This was expected. The rocky conditions at that site were noted to EPA in the Field Change Request form (Appendix A).
- Also at station RM11E-PW007, when the diver brought the passive sampler to the surface, the protective stainless-steel cover plates were still in place, and not lost as previously reported by the diver installing the sampler. The FD discussed this deviation with MIT and it was decided that the passive sampler still would likely provide useful information because it was clear that river water was reaching the film even though the cover was in place. Confirmation that river water had contacted the PE was indicated by the presence of the same reddish discoloration as was observed on the water-exposed site samplers at all other stations (see the photo in Appendix E, RM11E-PW007 PE Processing Log). Therefore, a PE sample from RM11E-PW007 was retrieved for processing and analysis. This deviation was reported to EPA on October 28, 2014, and EPA agreed with the decision to analyze the PE sheets (Appendix A). Limitations to using the RM11E-PW007 PE data are further discussed in Section 6.5.1.

2.4 PE Sample Processing

Processing of the PE samples at ALS followed the procedures described in Section 4.6 of the SAP. As cited in the SAP, those procedures were consistent with MIT's SOP for polyethylene device (PED) deployment and retrieval (Gschwend et al., 2012b) and those used in a similar study on the Lower Duwamish Waterway (Gschwend et al., 2013). All samples were held on ice, and transported to ALS for processing on October 21, 2014. A detailed description of the PE and sediment sample processing is provided in Appendix E, which also includes a complete description of samples retained.

Each PE sample was individually processed at ALS by SEE and GSI. The passive sampler was unwrapped from the foil and photographed, and then the PE sheet was rinsed and wiped and cut from the frame. On all PE sheets, there was a distinct reddish coloring on the water-exposed segment of the PE, whereas the portion that was in the sediment was white and not-discolored. The observed line between the discolored portion and the white portion of the PE was measured to document the water versus the sediment exposure areas, and to cut the PE into the respective segments (samples) for analysis. Following the SOP in Attachment 3 of the SAP, the PE surface was wiped with a new Kimwipe® and rinsed with deionized water to be visibly free of surface particles and coatings. As there was no visible oil or tarry exterior staining, wiping with a hexane-soaked Kimwipe® was not required.

After the PE sheet was wiped and rinsed, the sheet was cut with a clean razor blade into an upper segment and a lower segment representing the surface water and sediment exposed portions, respectively. As mentioned above, the distinction between the media was clear, based on the accumulation of suspended sediment and discoloration on the surface water segment, which provided a visible line across which the sheet was cut horizontally and the exposed depths were recorded, as shown in Table 2-4. For stations designated with an "A," the exposed sediment and surface water segments were cut in half longitudinally (into approximately 5-cm widths) for analysis. For most of the "B" passive samplers, the full 10-cm-wide exposed sediment and surface water sections were submitted for archival (and the longitudinal dissection was unnecessary). All PE sample aliquots were individually wrapped in aluminum foil and placed in separate labeled sample jars for PCB congener analysis and/or frozen archival. A complete list of PE samples for analysis and archival is provided in Table 2-4. After processing all of the PE samples, a chain of custody (COC) form was completed and the samples were assigned to ALS that same day. ALS then sent designated split samples to MIT (RM11E-PW001 and RM11E-PW004) as indicated on the COC form.

2.5 Sediment Sample Processing

The sediment cores also were processed at ALS on October 21, 2014. For each station, the sediment was extruded onto a clean sheet of aluminum foil, photographed, and the lithology logged. After logging, the top 30 cm of material were placed into a decontaminated stainless-steel bowl for homogenization before being placed into the allocated sampling containers. Two exceptions were RM11E-PW001, where there were only 25.4 cm of sediment, and RM11E-PW003, where there were 24.4 cm of material. In both cases, all of the sediment was processed. The physical characteristics of the sediment are included in Appendix E.

All homogenized sediment samples were divided into the appropriate laboratory-provided sample jars for PCB Aroclors, PCB congeners, black carbon, TOC and grain size analysis, as shown in Table 2-5. Aliquots from two stations, RM11E-PW001 and RM11E-PW004, were sent to MIT for analysis of PCB congeners, black carbon, and TOC. Sufficient sediment remained for a separate 8-ounce archive jar for stations RM11E-PW001, RM11E-PW002, and RM11E-PW006. ALS was instructed to archive any remaining sediment following analysis at the other stations.

Section 3. Laboratory Methods

This section summarizes the chemical and physical analyses that were performed on the PE and sediment samples. Procedures for chemical analysis and laboratory quality assurance (QA) and quality control (QC) conform to the approved SAP, except as noted below. The laboratory QC and data validation protocols were followed to evaluate whether data quality and representation are in accordance with method requirements and that data usability is appropriately assessed for project objectives.

The analytical approach for this sampling event corresponds to the project objectives stated in Section 2 of the SAP. The analytical parameters include:

- Porewater and surface water (estimated from direct measurements of PCB congener concentrations in the PE)
    - PCB congeners pre-loaded as PRCs from time zero (T_0) PE samples
    - PCB congeners (including PCB PRCs) extracted from deployed PE samples
- Sediment
    - Total solids (TS) (ALS only)
    - Grain size (ALS only)
    - TOC and black carbon
    - PCB congeners
    - PCB Aroclors (ALS only)

The following analyses were performed at the following ALS facilities: PCB Aroclors, TS, TOC, and grain size in Kelso, Washington; all PCB congeners (PE and sediment) in Houston, Texas; and black carbon in Tucson, Arizona. Split samples from RM11E-PW001 and RM11E-PW004 were sent to MIT for analysis of PCB congeners, TOC, and black carbon in sediment, and PCB congeners in PE. For ALS, laboratory QA/QC was maintained through the use of standard EPA methods and other accepted methods and standard analytical procedures for target analytes as described in the project QAPP Addendum (Appendix A of the Work Plan). MIT followed the QA/QC procedures found in its SOPs, as referenced in Section 5 of the SAP.

3.1 PRC Loading and Confirmation Sampling

PRC loading to the PE followed the methods described by Gschwend et al. (2012a) and employed the same PCB congeners that were used by MIT on the Lower Duwamish Waterway (Gschwend et al., 2013). One difference is that MIT used ^{13}C-labeled PRCs for the Lower Duwamish Waterway, whereas in the RM11E study non-labeled PRCs were loaded onto the PE sheets (see discussion below). The PRC congeners and each of their PCB homolog groups are listed in Table 3-1.

The PRC load rates for the seven target stations were based on the expected range of PCB congener concentrations in porewater at those locations (Table 3-2). Porewater concentrations were estimated using the one-carbon partitioning model[4] from the previously measured PCB Aroclor and TOC results in sediment (see Table 2-3 in the SAP). The PRC loading was determined on the basis of the maximum estimated single congener concentration (Table 2-2) by the formula:

$$PRC\ Load\ [\frac{\mu g}{kgPE}] = \left(\frac{C_{pw}\left[\frac{ng}{L}\right]\ x\ K_{pew}\ [\frac{L}{kgPE}]}{1000\ \frac{ng}{\mu g}} \right)$$

Where,

C_{pw} is the estimated concentration in the porewater

K_{pew} is the PE-water partitioning coefficient

The intent of the PRC estimate was to provide a loading that would be within a factor of 3 to 4 (maximum 10) of the expected concentrations rather than match them exactly. With the estimated porewater concentrations, and the maximum estimated individual congener porewater concentrations (Table 2-2), it was determined that two sets of PRC loads were needed: a "high" load (RM11E-PW001, RM11E-PW003, and RM11E-PW006) and a "low" load (RM11E-PW002, RM11E-PW004, RM11E-PW005, and RM11E-PW007).

MIT, ALS, and SEE conferred to develop, test, and confirm the PRC loading rates before initiating the loading of passive samplers for field deployment (Table 3-1). The following PRCs were identified in the SAP: PCBs 28, 47, 54, 97, 111, 153, and 178. A deviation from the SAP is that ALS used non-labeled research-grade congeners (purchased from Cambridge Isotope at 98 percent+ pure) instead of using ^{13}C-labeled PRCs. ALS's rationale for proceeding without using ^{13}C-labeled PRCs was that the planned PRCs were the same as those used by its laboratory as isotopic standards for high-resolution PCB congener analysis using EPA Method 1668c. Use of the ^{13}C-labeled PRC would either require ALS to develop new isotopic standards, or require additional effort by the RM11E Group to identify and confirm performance of alternate ^{13}C-labeled PRCs. Given that (1) ALS was already underway with the PRC loading when this issue was identified to the RM11E Group, (2) this would have resulted in an added delay to the schedule required by the SAP, and (3) the additional resources required to identify and use alternate ^{13}C-labeled PRCs, the potential impact to the project of using the non-labeled PRCs was evaluated.

The most common Aroclor detected at the site to date has been Aroclor 1260, and the respective reported percentages of PRC compounds in Aroclor 1260, by mass, are as follows: PCB 28 (0.03 percent), PCB 47 (zero percent), PCB 54 (0.41 percent), PCB 97 (0.09 percent), PCB 111 (zero percent), PCB 153 (9.39 percent), and PCB 178 (0.83 percent)[5]. With the potential exception of

[4] In this report, the term "one-carbon partitioning model" is used to represent the model that is referred to in the SAP as the "equilibrium partitioning model."
[5] Values from Frame et al. (1996).

PCB 153, these non-labeled PRCs were not expected to be present at RM11E. While labeled PRCs would be preferable, non-labeled PRCs have been used in other studies and would serve the overall purpose and objective of the SAP. Potential impacts to the study objectives are further discussed in Section 6.

To initiate the loading experiments, ALS prepared the "high" and "low" stocking solutions with PCBs 28, 47, 54, , 97, 111, and 153, and individually loaded (i.e., one PE sheet per jar) three 15 x 70-cm x 25-µm-thick pre-cleaned PE sheets. ALS inadvertently omitted PCB 178 from this initial test. The trial loading occurred for 45 days; at the end of loading, each exposed PE sheet was rinsed, patted dry, weighed, and analyzed at ALS's Houston, Texas, laboratory by EPA Method 1668c. The results, reported as micrograms of PCB congener per kilogram (µg/kg) PE sheet, were then converted to an estimated water concentration using PE-water partition coefficients (K_{pew})[6]. The test results, compared to the target loads, are presented in Table 3-1. For both the "high" and "low" loading rates, the measured loads were generally within a factor of 1.3±0.2.

Upon confirmation of the PE loading method, the loading of the PE sheets for the field-deployment was initiated. For each sampler deployed, a piece of the PE was retained for analysis and/or archival. These initial time measurements (T_0), presented in Table 3-2, were within a factor of 1.5±0.3 of the target levels. These measurements are used to determine fractional equilibration in Section 4 and estimate porewater and surface water concentrations in Section 6.

3.2 PE Sample Analysis – PCB Congeners in PE

3.2.1 PE Analysis at MIT

MIT followed the extraction and analysis procedures of Gschwend et al. (2012c), with the exception that MIT evaluated all 209 congeners, instead of a subset as described in that document. PE samples were extracted with dichloromethane (DCM) with surrogate (recovery) standards added for solvent extract. The extractions were repeated three times, the combined extracts were concentrated by solvent evaporation, injection standards were added, and PCBs were analyzed by high-resolution gas chromatography/low-resolution magnetic sector mass spectrometry with selective ion monitoring (HRGC/LRMS SIM).

3.2.2 PE Analysis at ALS

PCB congeners were extracted from the PE samples using DCM and analyzed by EPA Method 1668c at the ALS laboratory in Houston, Texas. This method differs from MIT in that it is an HRGC with high-resolution mass spectrometry (HRGC/HRMS) and includes the addition of known ^{13}C-labeled standards ("isotope dilution"), the recoveries of which are used to adjust the chromatographic signals from the target PCB congeners. Laboratory QA/QC was maintained through the use of appropriate standards, method blanks and continuing calibration verification, duplicates, surrogate spikes, matrix spike, and matrix spike duplicates (for sediment Aroclors) according to the methods cited in the SAP.

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[6] PE-water partitioning coefficients are derived from the octanol-water partitioning coefficients (K_{ow}) published by Hawker and Connell (1988) using the formula $\log K_{pew} = 1.00 * \log K_{ow} - 0.287$ (Fernandez et al., 2009b; Gschwend et al., 2011).

The initial data packages from ALS were received in November 2014. During the data validation process, several problems were identified by the RM11E consulting team, and vetted with ALS. The problems identified with the PE data included:

- Method blank contamination
- High analyte concentration relative to the concentration of the added internal standards
- High relative percent difference (RPD) between the field replicates
- Higher PRC concentrations after recovery in the field (T_{final}) than the initial T_0 samples
- Higher PCB congener PE samples results than those reported by MIT

After review with the RM11E Group and additional ALS internal reviews, ALS voluntarily re-called the November 2014 PE and sediment data packages, acknowledging that those data did not meet the QA/QC requirements for the project. The November 2014 data packages were rejected, with a requirement to re-extract and re-analyze the PE and the sediments. A letter from ALS to SEE dated January 7, 2015, detailing the inaccuracies with the data, is provided in Appendix A.

Corrective actions for the re-analyses are also detailed in the January 7, 2015, letter from ALS. The principal changes were to the extraction and reduction procedures, and are shown in a flow-diagram in Figure 3-1. The changes from the ALS SOP in the SAP included:

- Extracting and analyzing the "high" PRC load PE samples separately from the "low" PRC load PE samples. This was done to minimize potential cross-contamination between the two types of "loaded" samples.

- Additional decontamination of common laboratory equipment was implemented as a precautionary step in the process, knowing that these samples contained concentrations atypical of routine EPA Method 1668c applications.

- The labeled internal standards were added at higher concentrations to allow subsequent dilutions, as needed, to bring high concentration analytes into a reasonable range of the "209 Congener" standard.

- The extraction formulation was adjusted to produce reporting limits in line with the requirements of the SAP rather than attempting to push the limits too low relative to analyte concentrations.

The re-analyzed PE data were provided by ALS in February 2015. For stations RM11E-PW002, RM11E-PW003, RM11E-PW005, and RM11E-PW006, there was sufficient archived PE from the "A" field replicate to re-run the second analyses. While the initial review of the data indicated that the problems identified with the November 2014 analyses had been corrected, there were still gaps in data completeness that had to be addressed. These adjustments included the following:

- For RM11E-PW001, it was necessary to use the field "B" replicate because the "A" replicate had been exhaustively extracted at ALS and MIT. For comparative purposes, ALS was instructed to extract and analyze the T_0 samples for RM11E-PWP001 B (sediment exposure) and RM11E-PWW001 B (water exposure) as part of a separate batch. While the archived samples had been frozen, the freezing would not introduce

any artifacts that would compromise the PCB analyses (Gschwend, 2015, personal communication).

- For RM11E-PW004, it was necessary to use the field "B" replicate because the "A" replicate had been exhaustively extracted at ALS and MIT. For comparative purposes, ALS was instructed to extract and analyze the T_0 samples for RM11E-PWP004 B (sediment exposure) and RM11E-PWW004 B (water exposure) as part of a separate batch. While the archived samples had been frozen, the freezing would not introduce any artifacts that would compromise the PCB analyses (Gschwend, 2015, personal communication).
- RM11E-PW504 was the designated blind field replicate for RM11E-PW004. Both the RM11E-PW504-A and RM11E-PW004-A PE samples were exhaustively extracted. This necessitated requesting that ALS take one of the RM11E-PWW004-B (water exposure) and RM11E- PWP004-B (sediment exposure) PE strips to extract and analyze as field replicates as a separate batch. While the archived samples had been frozen, the freezing would not introduce any artifacts that would compromise the PCB analyses (Gschwend, 2015, personal communication).
- ALS exhaustively sampled the archived PE sheet for upriver station RM11E-PWW007. As noted in Section 2, that station was analyzed only for the surface water-exposed segment (RM11E-PWW007). RM11E-PWW007 was archived and logged on the COC form as a single sheet, pending the decision by EPA if analyzing that sample could inform the process. Although instructed to analyze a portion of archived RM11E-PW007, the ALS laboratory in Houston, Texas, inadvertently extracted the entire sample. The November 2014 results for RM11E-PWW007 are reported in Section 6, with a discussion of the usability of those data.

PE analyses are summarized by station and data package in Table 3-3. Data validation is discussed further in Section 4. The results of the PE analyses are presented in Section 6.

3.3 Sediment Sample Analysis

3.3.1 MIT TOC, Black Carbon, and PCB Congener Analyses

Sediment samples were analyzed for TOC and black carbon via MIT's CTO-375 method (Gustafsson et al., 1997). Briefly, this involves drying the sample, grinding it to make a fine powder, combusting split samples of the ground sample (powder) for black carbon measurements in ceramic crucibles at 375^0C (degrees Celsius) under air for 24 hours, transferring weighed aliquots of the heat-treated (for black carbon) and untreated (for TOC) samples to silver capsules, acidifying to remove any carbonate minerals, and finally analyzing the carbon contents using a high-temperature, elemental carbon, hydrogen, nitrogen (CHN) analyzer.

Sediment samples were analyzed for PCB congeners by HRGC/LRMS. This was done by adding surrogate (recovery) standards, extracting with solvents (DCM/methanol (MeOH)) using an accelerated solvent extractor, removing sulfur from the extracts using copper, reducing the solvent volumes, and analyzing via HRGC/LRMS. Sediment concentrations were recovery-corrected using the results of like-chlorinated surrogate standards; surrogate recoveries ranged from 86 to 106 percent.

3.3.2 ALS Sediment Conventional Analyses, PCB Congeners, and PCB Aroclors

Sediment conventional analyses included TS, grain size, TOC, and black carbon. TS, grain size, and TOC were analyzed at the ALS laboratory in Kelso, Washington. Sediment analyses are summarized by station and data package in Table 3-4. The methods followed those defined in the SAP. Sediment black carbon analyses were conducted at the ALS laboratory in Tucson, Arizona. All of the conventional analyses met QA/QC requirements. One unusual result was an elevated level of black carbon at station RM11E-PW003 of 4.7 percent. The range of black carbon at all the other stations was less than 0.2 percent. By request, ALS re-analyzed RM11E-PW003 in replicate with similar results ranging from 4.3 to 6.2 percent. These results are discussed further in Section 5. Sediment PCB congeners were analyzed by EPA Method 1668c at the ALS laboratory in Houston, Texas, while Aroclors were analyzed by EPA Method 8082 at the ALS laboratory in Kelso, Washington.

Problems were also noted in the review of the November 2014 sediment data in both the Aroclor and congener data. These problems included significantly different RPDs between the blind field replicates (14 to 149 percent), method blank contamination, and differences between reported congener concentrations between ALS and MIT. In the January 7, 2015, letter, ALS also agreed to recall all of the November 2014 sediment data and conduct re-analyses. ALS provided the re-issued PCB congener data in February 2015 and Aroclor data in March 2015.

Section 4. Data Validation and Management

Data generated as part of the porewater characterization were validated and managed as described in previous sections and in accordance with the methods described in the QAPP Addendum (Appendix A of the Work Plan) and Section 6 of the SAP. These techniques incorporate data management protocols used for the Portland Harbor RI/FS and were implemented to provide consistent, accurate, and defensible documentation of data quality. Data validation and management procedures and any significant deviations from the SAP and QAPP Addendum are described in this section.

4.1 Data Validation

Analytical data from ALS were subjected to a formal verification and validation in accordance with EPA guidance documents as described in the QAPP Addendum and the SAP. The validation evaluated the laboratory reports against method requirements, QA/QC criteria set forth in the QAPP, and the project objectives.

During the data validation process, the RM11E Group's contractors identified significant issues with the validity of data from the PE and sediment samples analyzed by ALS as reported in the November 2014 data packages. As described in its letter dated January 7, 2015, ALS recalled the PE and sediment data packages it had submitted to the RM11E Group because the data did not meet the project's QA/QC requirements (ALS, 2015). ALS then re-extracted and re-analyzed the PE and sediment samples and submitted the results for validation, as noted in Sections 3.2.2 and 3.3.2.

Pyron Environmental (Pyron) in Olympia, Washington performed the third-party data validation. A Stage 2B validation (as defined in EPA, 2009) was performed on inorganic data (i.e., TOC and black carbon); a Stage 4 validation was performed on PCB Aroclors and congener data. Data qualifiers were determined and assigned during data validation when QA/QC limits were not met and the qualification was warranted following guidance specified by EPA (2009, 2011, 2014a, 2014b, and 2014c), QC requirements specified in the SAP, and method-specific QC requirements, as applicable.

The revised ALS sediment results, including PCB Aroclor, PCB congener, TOC, black carbon, TS, and grain size were determined to be valid for EPA SW-846 requirements, and to meet the Portland Harbor CERCLA data quality criteria. The revised ALS sediment-exposed PE and surface water-exposed PE were also determined to be valid for EPA SW-846 requirements. A data validation report (DVR) summarizing the data validation procedures and findings for both the sediment and the PE data was prepared and is provided in Appendix F of this report.

Data reported by the MIT laboratory were intended as a comparative measure to those reported by ALS. While MIT's methods are scientifically accepted, those methods are not in strict adherence with EPA SW-846 and have not undergone third-party data validation. Accordingly, those data do not conform to the CERCLA requirements and thus will not be uploaded into the project database or files. Only detected analytes are shown in the report tables of MIT data.

Additional information provided by MIT is included in Appendix I. Appendix I also includes specific congeners used by MIT as spike standards, percent recoveries, and correction calculations.

Three reported congener values in the PE for RM11E-PW001, for PCB 29, 38, and 129, were qualified as rejected (R) by MIT. While initially reported as a detected compounds in both the sediment-exposed and water-exposed PE, after further review with MIT it was determined that the detections were suspect because those three congeners very closely eluted to PCB 54, 47, and 153. Because PCB 47, 54, and 153 were used as PRCs, the actual signals attributed to PCB 29, 38, and 129 cannot be confidently measured and the true values were likely near or equal to zero (i.e., non-detect). The high concentrations of the PRC congeners were found to have created a spectral artifact that created a false measure for the three non-PRC congeners.

It should be noted that the final PE results from ALS, though passing initial validation for EPA SW-846, may require additional qualification for similar reasons. For some congeners at locations RM11E-PW001, RM11E-PW003, and RM11E-PW006, the reported values may have been biased high by the "high-load" PRCs.

4.2 Data Usability to Meet Project Objectives

4.2.1 Sediment Data

All ALS sediment PCB Aroclor, PCB congeners, grain size, and TOC are valid and useable for the project objectives. With one exception, the black carbon data are useable for project objectives. The elevated level of black carbon at station RM11E-PW003 of 4.7 percent is anomalous. Generally, black carbon values are a fraction of the TOC, but in this case, the value was greater than the TOC value. Replicate analyses were conducted on this sample, but the results were still elevated above the TOC levels. There is not a clear explanation for the black carbon level being elevated above the associated TOC result (e.g., elevated levels of calcium carbonate that were not digested in the acid treatment).

The MIT sediment PCB congeners, TOC, and black carbon data are useable for the project objectives. While the MIT data cannot be validated relative to EPA SW-846, similar data generated by MIT for other Superfund sites, including the Lower Duwamish Waterway (Gschwend et al. 2011), United Heckathorn (SEA Engineering, 2014), and Palos Verde Shelf (Fernandez et al. 2012), have been accepted for use by EPA.

4.2.2 PE Data

The ALS PCB data in sediment-exposed PE are valid, but are not useable for the project objective (discussed below). The ALS surface water-exposed PE data are valid and useable for the project objectives. All MIT PCB data in PE, while not validated by SW-846, are useable for the project objectives.

Passive porewater sampling is an evolving method that has just begun to move out of the research institutes, where it is being developed. To estimate porewater and surface water concentrations from concentrations measured in PE, the passive porewater method requires the ability to determine the relative state of equilibrium between the PE and the surrounding environment.

PRCs are used in the passive porewater measurement method to estimate concentrations of PCB congeners in porewater and surface water from concentrations measured in PE. The passive porewater method is dependent on achieving the depletion of PRC compounds from the PE consistent with kinetically based trends. It is expected that the observed losses would be inversely related to the K_{pew} associated with each PRC. For example, greater losses would be anticipated from the lower-chlorinated PRCs (54, 28, and 47, in order of increasing hydrophobicity [K_{pew}]) than the more hydrophobic, higher-chlorinated PRCs (97, 111, 153, and 178), which are anticipated to be much further from equilibrium (i.e., show less loss of PRC mass).

ALS sediment-exposed PE data (reported in Section 6) did not show the required depletion of PRCs and, in many cases, the results displayed greater losses by the more hydrophobic higher-chlorinated PRCs than by the lower-chlorinated PRCs, indicating that the equilibrium relationship necessary for calculating porewater concentrations could not be established. The ALS PRC results for sediment-exposed PE are presented as a bar chart in the left side of Figure 4-1, as the degree of equilibration observed between the T_0 and T_{final}. The PRCs are arrayed on the x-axis in order of increasing hydrophobicity (low K_{pew} to high K_{pew})[7]. The y-axis shows the degree of equilibration, which is expressed as:

$$Fractional\ \ Equilibration = 1 - \frac{\left(C_{PRC,Tfinal}\right)}{C_{PRC,T0}}$$

Where,

$C_{PRC,Tfinal}$ is the PRC concentration in PE post-retrieval.
$C_{PRC,T0}$ is the PRC concentration in PE at the time of deployment.

The more PRC lost, the higher the fractional equilibration. In cases where there is higher recovered PRC at T_{final} than T_0, the fractional equilibration is a negative number.

This apparent lack of equilibration of PRCs in sediment-exposed PE was observed across all six ALS PE samples. Given the uncharacteristic responses, porewater concentrations cannot be estimated from ALS-analyzed sediment-exposed PE samples, and, by extension, site-specific partitioning coefficients between sediment and porewater cannot be established. The ALS data for sediment-exposed PE have therefore been deemed unusable in meeting project porewater objectives. The inability to use the ALS-analyzed PRC data for the sediment-exposed PE is further discussed in Section 6.

For the two sediment-exposed PE samples analyzed by MIT (right side of Figure 4-1), and the surface water-exposed PE reported by both the MIT and ALS laboratories (left side of Figure 4-2), the expected equilibration of the PRCs was observed in all samples. Porewater concentrations can be estimated from the MIT sediment-exposed PE results, as presented in Section 6. Surface water concentrations can also be estimated from the surface water-exposed PE data submitted by both MIT and ALS and are presented in Section 6.

[7] Congener number does not equate to the degree of hydrophobicity. PCB 54 has the lowest K_{pew} of the seven PRCs.

4.3 Data Management

Data management protocols are described in Section 6 of the SAP and in Section 7 of the Work Plan. Protocols for both field data and electronic data were consistent with those used throughout the Supplemental RI/FS and the previous RM11E Focused Sediment Characterization (GSI, 2009a, 2009b, and 2010a). The objective of the protocols is to provide consistent, accurate, and defensible documentation of data quality.

Field observations were transcribed, and QA reviewed by the Sampling and Analysis Coordinator (SAC) or FD and are provided in Appendices C through E. Copies of the COC forms are provided with the laboratory reports in Appendix H.

Report tables containing the sediment and PE results from ALS were generated by GSI in Microsoft (MS) Access using laboratory-provided electronic data deliverables (EDDs) and the data qualifiers assigned during data validation. The results were checked against the hard copy laboratory reports for consistency. All tabulated MIT results and calculations were transcribed into the report tables by SEE, and reviewed again by MIT for consistency with the original data deliverable.

Validated electronic sediment data obtained from ALS have been incorporated into the project database by the Data Manager (DM) and are provided as an Excel Data File in Appendix G. Because the porewater and surface water calculations presented in Section 6 are values that have been derived from the PE results only for detected constituents, and given the usability concerns discussed in Section 4.2, those estimated concentrations and the retained PE results are presented in report tables and figures, but are not considered to conform to existing Portland Harbor data guidelines and will not be included in the internal project database or the Excel flat file that is provided with this report.

4.4 Data Reduction and Handling

Data reduction and handling were conducted according to the data management rules described in Section 7 of the Work Plan and are based on procedures followed in Portland Harbor RI sediment investigations (Integral et al., 2011; Integral, 2008; Kennedy/Jenks, 2004).

4.4.1 Data Summation Rules

Two sets of rules for summing data and retaining or modifying qualifiers are provided in the Portland Harbor RI/FS: (1) RI data set summation rules (RI Calc) and (2) risk assessment (RA)/background data rules used in the FS (FS Calc). The summation rules, which are described in detail in Section 7 of the Work Plan, apply to select analytical groups, such as PCB Aroclors and PCB congeners. The "RI data rules (RI Calc)" are intended for site characterization and generally use zero to represent non-detect values, while the "RA/background data rules (FS Calc)" are intended for RA and determination of background preliminary remediation goals (PRGs) and generally use one-half the method detection limit (MDL) to represent non-detect values. The FS Calc rules result in higher values than do the RI Calc rules, especially for low-concentration samples where many of the PCB congeners are non-detect and, therefore, the FS Calc approach is adding multiple "0.5 MDLs" to the calculation.

The RI data set summation rules are applied to analyte group totals (e.g., PCB congeners and PCB Aroclors) and are as follows:

- Calculated totals are the sum of all detected concentrations, with non-detected concentrations treated as zero.
- If all analytes for a total are not detected, then the highest MDL is used for the summation.

The RA and background data set summation rules for the FS are applied to analyte group totals (e.g., PCB congeners and PCB Aroclors) and are as follows:

- Calculated totals are the sum of all detected concentrations, with non-detected results included in the summation at one-half the MDL.
- If all analytes for a total are not detected, then the highest MDL is used for the summation.

Total PCB congener and PCB Aroclor results in sediment (Section 5) are presented using both the RI Calc and FS Calc rules. Data qualifiers were carried through the summation procedure. If all of the analytes were not detected, a "U" qualifier was carried through to indicate that all results were reported as undetected. If one "J" qualifier (estimate concentration) was reported in a sum group, it was carried through to the summation qualifier. All calculated totals were flagged with a "T" indicating they were mathematically derived values. Because only the detected PCB concentrations in PE can be converted to estimated PCB concentrations in porewater and surface water, only the RI Calc rules were applied to the total PCB congener and PCB Aroclor results in Section 6 and the non-detected constituents in the calculated data tables (or the MIT tables where the non-detected levels were not calculated) are represented as "ND," signifying "non-detect."

4.4.2 Data Averaging and Field Split Samples

Analytical results for the two field QC split samples are presented in Appendix J. The parent and duplicate results for sediment station RM11E-PW004-SED are provided in Table J-1 (Appendix J), and only the averaged values of field splits are used in the data analysis and presented in the Section 5 tables and figures and in the data file provided as Appendix G.

The averaging rules that were applied are consistent with those used in the Portland Harbor RI/FS when addressing these three general combinations of detected and non-detected results:

- If the analyte was detected in two or more samples, only the detected results were averaged (the non-detected results are not included).
- If the analyte was detected in only one sample, the detected value was reported as the average (the non-detected results are not included).
- If the analyte was not detected in any samples, the lowest MDL was reported as the average.

Data validation qualifiers also were assigned in accordance with the guidelines used on the Portland Harbor RI/FS. If all results, including the calculated average, have the same qualifier,

then that qualifier was applied to the calculated average. If one or more of the results was qualified as estimated (J - flagged), then the calculated average was similarly qualified with a "J." A "T" qualifier was added to results that are mathematically derived, including averaged and summed results.

The field split results for the sediment-exposed and surface water-exposed PE are provided in Table J-2 (Appendix J) for the parent and duplicate sample stations RM11E-PWP004B and RM11E-PWW004B, respectively. Averages were not calculated for the PE field splits for the following reasons: (1) the duplicate samples were extracted separately from the parent PE samples and analyzed in a separate batch from corresponding parent samples; (2) individual versus co-eluting congener reporting was inconsistent and special averaging rules would need to be developed to avoid double counting congeners, which would lead to inconsistency with the data guidelines used in the Portland Harbor RI/FS; and (3) the PE data require subsequent post-processing and calculations that would be more reliably conducted on a single set of results (rather than a calculated average). Thus, only the parent sample results are used in the data analysis and presented in the Section 6 tables and figures.

4.4.3 Re-Occupied Stations

As described in Section 2 of the SAP, the sampling stations targeted in this porewater characterization were placed at the same coordinates as previous sample locations that contained elevated surface and/or subsurface sample results to assess any changes in PCB concentrations relative to previous rounds of sampling. The existing surface sediment sampling locations that were re-occupied during this porewater characterization are: LW3-UG02/RM11E-G079, RM11E-G022, RM11E-G026, RM11E-G027, RM11E-G028, and RM11E-G033.

A tabular comparison of the analytical results for the re-occupied stations is provided in Section 5 and both sets of data are included in the data file provided as Appendix G.

Section 5. Bulk Sediment Results

Analytical results reported by ALS have been tabulated for the RM11E bulk sediment samples. Table 5-1 presents results of the surface sediment samples following reduction of the field QC split (RM11E-PW004-SED).

Figure 5-1 shows re-occupied sample collection locations compared to prior sample collection locations. A tabular comparison of the common analytical results for the resampled stations is provided in Table 5-2. Figure 5-2 was prepared to help visualize the distribution of total surface sediment PCB concentrations within the RM11E Project Area. Individual results are shown as color-coded symbols and the RAL footprints were interpolated using the natural neighbor interpolation technique (in ArcGIS) of individual surface sediment concentrations in a manner consistent with the Draft FS for the PHSS. The upper panel of Figure 5-2 is an updated version of Figure 10-2 from the RM11E Field Sampling and Data Report (GSI, 2014) which replaces prior results for re-occupied sediment stations with more recent results collected by the RM11E Group. The lower panel presents the PCB RAL footprints using all existing RI/FS data, including individual results (both current and historical) from re-occupied stations. For consistency with the Portland Harbor RI/FS, total PCB concentrations shown in Figure 5-2 use the FS Calc and rely on total PCB congener data, where available, and total PCB Aroclor data, where congener analysis was not conducted.

Table 5-3 is a summary comparison table of ALS and MIT surface sediment data for conventional analytes, PCB homologs, and total PCB congeners summed according to RI Calc rules. A comparison of the laboratory results for the PCB homologs shows that for these stations the ALS measurements report a higher relative percentage of 'tetra' and 'penta' PCB congeners as compared to MIT. There are too few data (two stations) to evaluate whether there is a systematic pattern in the discrepancy between ALS and MIT laboratories. Furthermore, there are differences between the labs in reporting co-eluting PCB congeners that would make those evaluations difficult. The reason for this difference may well be due to variations in laboratory methodology and is not resolvable within the scope of this study. Complete MIT data are presented in Appendix I.

The data in Tables 5-1, 5-2, and 5-3 exhibit congener distributions that indicate the presence of lighter congeners than those generally associated with Aroclor 1260, the only Aroclor that was reported as detected by ALS. Earlier-eluting peaks in the Aroclor chromatograms were present, but did not meet ALS's qualitative criteria for identification (i.e., pattern matching). Because the presence of the earlier-eluting Aroclors could be neither confirmed nor ruled out, ALS elevated the associated detection limits to the level of the interferences for those Aroclors.

Section 6. Porewater and Surface Water Results and Data Evaluation

This section provides the results of the analyses of PCB congeners as measured in the sediment-exposed and surface water-exposed PE sheets. The results, as reported by ALS and MIT, are included for comparison. This section also describes the process for estimating the PCB concentrations in porewater and surface water based on the PE measurements.

6.1 PE Results

Analytical results for the measurements of the time final (T_{final}) congeners by ALS for sediment-exposed and surface water-exposed PE are presented in Table 6-1. Table 6-2 provides the PE measurements for the two stations, RM11E-PW001 and RM11E-PW004, which were analyzed by both ALS and MIT. The laboratory reports containing the PE measurements by ALS are provided in Appendix H and the MIT data are provided in Appendix I.

The congener results in these tables do not include a correction for what the levels of the seven PRC congeners (PCB 28, 47, 54, 97, 111, 153, and 178) reported in the sediment would have been in the PE if they had not been loaded onto the PE prior to deployment.

6.2 Estimating Porewater and Surface Water Concentrations from PE Measurements

Calculating water concentrations from the PE measurements followed the procedures of Fernandez et al. (2009a), as cited in Section 2.2 of the SAP, as well as EPA and SERDP/ESTCP (in press) and Gschwend et al. (2011). The methods herein are consistent with those used by Gschwend et al. (2013) for the Lower Duwamish Waterway. Briefly, for porewater, concentrations of PCB congeners measured in the PE were first corrected for the relative fractional equilibration (equilibrium concentration in the PE), and then divided by the PE-water partitioning coefficient. Correcting for the relative fractional equilibration, and then the estimation of the porewater or surface water concentration from the equilibrated values, are discussed below.

6.2.1 Correcting for the Relative Fractional Equilibration

Critical to the application of the model is the relative fractional equilibration of the PCB congener measurement in the PE. If exposed in the environment for a sufficiently long period of time, the PE would accumulate PCBs until equilibration has been achieved between the various environmental phases (EPA, 2012). Fernandez et al. (2009) demonstrated that the PE can be deployed for shorter time frames by the use of PRCs. The concentration of the PRCs in the sampler after it is retrieved are then used to gauge the system's compound-dependent tendency toward equilibrium and hence to extrapolate the contaminant concentrations measured in PE to their estimated equilibrium values in porewater and surface water.

Thus, the C_{PE} for each congener needs to be adjusted (i.e., corrected) for how close to equilibrium the PE and water are to accurately estimate the porewater/surface water concentrations. For example, a measurement made in PE of PCB 1 would be expected to equilibrate quickly and after 60 days could be as high as 80 percent equilibrated. The C_{PE} would then be the reported PE concentration divided by 0.8 to adjust the measured PE concentration upward to the equilibrium concentration.

The PRCs impregnated in the PE before deployment are the compounds used to determine the fractional equilibration and determine the correction for the samplers' incomplete equilibration with the sediments (Fernandez et al., 2009a; Ghosh et al., 2014; Gschwend et al., 2011 and 2014). For sediment PE, MIT developed a computer program using the equations from Fernandez et al. (2009a) that is used to take the fractional losses from the PRCs and output the estimated equilibration fraction for each of the 209 PCB congeners. The program, called PRC Calculator and the accompanying User's Guide are available online (Gschwend et al., 2014), calculates a linear regression and an equation for that line that is used to provide the equilibrium correction factor to the PE-measured concentration. PRC Calculator requires a relatively consistent loss: higher losses for the low K_{pew} PRCs (54, 28, and 47), to lower or no loss for the higher K_{pew} PRCs (97, 111, 153, and 178). One additional consideration is that losses of less than 20 percent from T_0 are not input to the model, given the relative analytical uncertainty with the measurement. PRC calculations are further discussed in the following section.

It should be noted that the PRC calculator assumes that the PRCs used are not present in the sediments. Because PRCs were detected in the sediments collected as part of this study, an evaluation was completed by MIT to estimate the impact on the fractional equilibrium predicted by the PRC calculator. MIT has estimated that the impact for results at location RM11E-PW004 would be minimal and the impact at location RM11E-PW001 may over-report the equilibrium-corrected concentrations by approximately 10 percent. The results have not been amended to adjust for this because the estimated error is within the uncertainty of the analytical results.

For surface water, a regression of the fractional loss of the PRCs against the K_{pew} may be used to establish a linear regression equation that may be applied to estimate the fractional equilibration (Gschwend et al., 2014; Lohman et al., 2005). The regression equation may be used where the correlation is reasonably strong ($r^2 > 0.75$; Gschwend, 2015, personal communication). Where the linear regression is not statistically supported, best professional judgment was exercised in averaging and applying the fractional loss for the tri- and tetra-chlorinated PRCs, and then separately the penta- through octa-chlorinated PRCs. The regression equations and/or supporting averaging calculations and associated assumptions are provided in Appendix K.

6.2.2 Estimation of Water Concentrations from Equilibration-Corrected PE Measures

The estimated concentration of PCB congeners in porewater or surface water is calculated by dividing the equilibration-corrected value by the congener-specific PE-water partitioning coefficient. Mathematically, this is expressed as:

$$C_w\left[\frac{ng}{L}\right] = \left(\frac{C_{PE}\left[\frac{\mu g}{kgPE}\right]}{K_{pew}\left[\frac{L}{kgPE}\right]}\right) \times 1000\ \frac{ng}{\mu g}$$

Where,

C_w (ng/L) is the concentration of the congener in porewater or surface water (EPA and SERDP/ESTCP, in press);

C_{PE} (µg/kg) PE is the equilibration-corrected concentration in the PE; and

K_{pew} (L/kg PE) is the equilibrium PE-water partition coefficient.

The parameters/equations used to derive the water concentrations from the PE measurements are presented in Table 6-3.

6.3 Results for the PRCs

6.3.1 Sediment-Exposed PRCs in PE

Results for the T_0 and T_{final} measurements for ALS-measured PRCs are presented in Table 6-4, and the fractional equilibration percentages are provided in Figures 4-1 and 4-2 for all sediment and surface water stations, respectively. The PRC results for the MIT PRCs are presented in Table 6-5, and the fractional equilibration percentages are also provided in Figures 4-1 and 4-2. As discussed previously in Section 4.2, the ALS-reported PRC losses were either (1) not linear (RM11E-PW002, RM11E-PW005), (2) linear with increasing equilibration with the higher K_{pew} PRCs (e.g., RM11E-PW003, RM11E-PW006), or (3) linear, but with most values below the 20 percent loss threshold needed to run the PRC Calculator (RM11E-PW001, RM11E-PW004). The departure from expectations and method needs for measured PRC losses from the PE does not allow for calculating sediment porewater concentrations from the ALS-analyzed PE sample results.

For the two stations (RM11E-PW001 and RM11E-PW004) analyzed by MIT (Table 6-5), the fractional equilibration is generally consistent with expectations and method needs. The lower-chlorinated and low K_{pew} PRCs exhibit a higher fractional equilibration than that measured for the higher-chlorinated and higher K_{pew} PRCs (Figures 4-1 and 4-2).

There are two apparent anomalies for the PRCs in the MIT-reported PRC congeners at RM11E-PW004, PCB 47, and 178, which were evaluated before running the PRC Calculator. PRC 47 was not used in the evaluation of PRC loss and fractional equilibration calculations. PCB 47 only exhibited 10 percent equilibration. Examination of the PCB sediment congener data showed relatively high concentrations of PCB 47 in the sediments at RM11E-PW004, as reported by both MIT and ALS. The PE for RM11E-PW004 was a "low" PRC load sample, the concentrations in sediment were higher than those in the PE. Collectively, these data suggest that PCB 47 migrated into the PE. Because PCB 47 showed less than 20 percent equilibration, the PRC Calculator was run without PCB 47 as provided in the method.

PCB 178 exhibited higher than expected equilibration (higher loss from the PE); greater than that of PCBs 97, 111 and 153. The PRC Calculator was calibrated by running the model with,

and then without, PCB 178. The output of the PRC Calculator-predicted equilibration of the PRCs was then compared against the observed equilibration. Because the model output more closely resembled the measured PRC values when PCB 178 was omitted, it was not used in subsequent application of the PRC Calculator. The model output relative to the observed PRC equilibrations is in Appendix K.

6.3.2 Surface Water-Exposed PRCs in PE

Results for the T_0 and T_{final} measurements for ALS-measured PRCs in the surface water-exposed PE are presented in Table 6-4, and the PRC equilibration percentages are shown graphically in Figure 4-2. For the ALS data, the graphics are shown separately for the "high" PRC load and the "low" PRC load stations. The PRC results for the MIT PRCs are presented in Table 6-5, and the PRC equilibration percentages are also shown in Figure 4-2. For the ALS and MIT reported PRCs in the surface water-exposed PE, the PRC losses are more consistent with the expected ranges and method needs. These data can be used to calculate the surface water concentrations from the PE sample results. Both the ALS and MIT estimated surface water concentrations are calculated and presented in Section 6.5.

6.4 Estimated PCB Concentrations in Porewater

Porewater concentrations estimated from the MIT data for RM11E-PWP001 and RM11E-PWP004 are presented in Table 6-6. Supporting calculation for the MIT data are presented in Appendix K. As noted in Section 6.1, these results do not include any estimates for the congeners used as PRCs that were also observed in native sediments.

Figure 6-1 shows a graphical distribution of the congeners measured in sediments, and the estimated porewater and surface water concentrations of those same congeners. Figure 6-1 also includes the reported total Aroclor concentrations in the sediments (from ALS, Table 5-1), and the sum of the sediment congeners as reported by MIT (Table 5-3).

As shown in Table 6-6, the estimated concentrations of individual detected congeners in porewater from station RM11E-PW001 are equal to or less than 4.2 nanograms per liter (ng/L), with a sum of the detected congeners in porewater at 18.7 ng/L. The distribution of congeners in sediments is dominated principally by the higher chlorinated congeners (PCB 151 and above), with relatively smaller concentrations in mid- to lower chlorinated congeners. The estimated porewater concentrations exhibited the opposite trend, with higher concentrations in the lower chlorinated congeners (PCB 53 and below), and lower concentrations in the same higher chlorinated congeners that dominated the sediment congener pattern.

For RM11E-PW004, estimated concentrations of individual detected congeners are equal to or less than 10.3 ng/L, with a sum of the congeners in porewater at 34.7 ng/L (Table 6-6). The congener distribution pattern is more evenly spread among the low- to higher-chlorinated congeners. As noted previously, PCB 47 (co-eluting with PCB 48 and 75) had the highest concentration measured in the sediment. The estimated porewater concentrations for RM11E-PW004 are also represented as higher concentrations in the lower chlorinated congeners (PCB 53 and below).

An observation on the data that appears to be counterintuitive is that RM11E-PW001 and RM11E-PW004 have different concentrations of total PCB congeners in sediment (256 versus 1,271 µg/kg as reported by MIT, respectively) while the sum of the total PCB congeners in

porewater is estimated to be within a factor of two (18.7 and 34.7 ng/L, respectively). While both stations have approximately the same concentration of TOC in sediment (0.4 and 0.64 percent as reported by MIT, respectively), the black carbon levels reported by MIT differ by nearly an order-of-magnitude (0.03 and 0.25 percent, respectively). Levels of pyrogenic carbon ("black carbon") in sediments show a high affinity for sequestering HOCs. The difference in the relative amounts of pyrogenic carbon may account for the additional sequestration of the PCBs that otherwise would have diffused into the PE.

6.5 Estimated PCB Concentrations in Surface Water

6.5.1 ALS Surface Water Estimates

Surface water concentrations estimated from the ALS data are presented in Table 6-7. Supporting calculations for the values in Table 6-7 are presented in Appendix L. Figures 6-2 and 6-3 show a graphical distribution of the congeners measured in sediments by ALS, and the estimated surface water concentrations of those same congeners, for low- and high-load samples, respectively. As noted in Section 4, the final PE results from ALS, though passing initial validation for EPA SW-846, may require additional qualification. For some congeners at locations RM11E-PW001, RM11E-PW003, and RM11E-PW006, the reported values may have been biased high by the "high-load" PRCs.

Individual congener concentrations for stations RM11E-PW001, RM11E-PW002, RM11E-PW003, RM11E-PW004, and RM11E-PW005 in surface water are estimated to be equal to or less than 0.2 ng/L. The sum of estimated congeners in the surface water at these stations ranged from 0.29 ng/L at RM11E-PW005 to 3.47 ng/L at RM11E-PW006.

Station RM11E-PW007 (Figure 6-2) represents an estimate of PCB congeners upstream of the RM11E Project Area. While the failure to remove the protective cover immediately post-placement is a caveat when considering these data, sufficient PRC was lost during the exposure period to warrant discussion. Only 18 congeners were reported as detected in the upstream surface water; all at very low levels, with the sum of the detected congeners estimated to be 0.66 ng/L. With one exception, all of the estimated congener concentrations were below 0.05 ng/L. PCB 159 was the exception, which was estimated to have a concentration of 0.5 ng/L.

6.5.2 MIT Surface Water Estimates

Surface water concentrations estimated from the MIT PE data are presented in Table 6-6; the supporting calculations are included in Appendix K. Figure 6-1 shows the distribution of measured concentrations of PCB congeners in sediment, and the estimated concentrations in the porewater and surface water. For RM11E-PW001, the estimated individual congener concentration is at or below 0.21 ng/L, with a total sum of the congeners in water at 0.97 ng/L. For RM11E-PW004, the estimated individual congener concentrations are at or below 0.66 ng/L, with a total sum of the congeners in water equaling 1.9 ng/L

Section 7. Evaluation of Site-Specific Partitioning

The design of the porewater sampling program at RM11E was intended to provide a basis for empirical estimates of the freely dissolved PCBs in sediment porewater and in the surface water immediately above the mudline (Section 2.1 of the SAP). The goal was to develop site-specific sediment-water partitioning coefficients that could be used to inform the Recontamination Assessment and future remedial design.

The lack of usability of the ALS-reported concentrations of PCB congeners in the sediment-exposed PE to estimate porewater concentrations limits the dataset available to evaluate site-specific partitioning coefficients for PCBs. However, the MIT-reported data for sediment-exposed PE from stations RM11E-PW001 and RM11E-PW004 can be used to estimate porewater and surface water PCB concentrations (Section 6.3) and site-specific partitioning coefficients.

These estimated sediment porewater data from RM11E-PW001 and RM11E-PW004 will be used in this section to evaluate equilibrium partitioning models to calculate PCB porewater concentrations from sediment PCB concentrations (Aroclors and sum of PCB congeners). Those results are compared to the estimated porewater concentration from the MIT sediment-exposed PE results. Secondly, these data will be used to calculate site-specific sediment-water partitioning coefficients for PCBs at RM11E.

The partitioning of PCBs from sediments to the porewater will be evaluated in the Recontamination Assessment Report, along with other considerations, such as groundwater flux and surface water, for potential impacts to a sediment cap.

7.1 Partitioning Models to Predict Freely Dissolved PCBs

Partitioning models can be used in sediment evaluation programs to calculate the "freely dissolved" HOCs. These models are based on the theory that HOCs in the sediment generally exist in equilibrium between sediment organic matter and water in the interstitial spaces between the sediment particles (i.e., porewater). Estimates made from passive PE samples have been demonstrated to predict freely dissolved HOCs in porewater with an accuracy of $^{+}/_{-}$ 30 percent (EPA, 2013; EPA and SERDP/ESTCP, in press; Gschwend et al., 2011, 2013). Passive sampling results have also been used to develop site-specific models for predicting freely dissolved concentrations (Ghosh et al., 2014). As discussed below, the two most-frequently used equilibrium partitioning models are the commonly named the "one-carbon" and "two-carbon" partitioning models.

7.1.1 One-Carbon Partitioning Model

The one-carbon partitioning model is based on the assumption that HOCs always partition between two phases: sediment organic matter and porewater (EPA, 2012). The one-carbon partitioning model has been used in Appendix E of the Draft Final RI Report for the Portland Harbor to calculate flux of PCBs (and other organic contaminants) from sediments into the

overlying river water, and was used in the Bioaccumulation Modeling Report (Windward, 2009). These calculations were based on theoretical calculations of dissolved PCBs in porewater using the bulk sediment PCB concentration, compound-specific sediment organic carbon (OC)-water partitioning coefficients, and the concentration of TOC.

The one-carbon partitioning model is mathematically expressed as:

$$C_{pw} \approx C_{sed}/(f_{toc} * K_{oc})$$

Where,

C_{pw} is the estimated concentration of the freely dissolved PCBs in porewater,

C_{sed} is the measured PCB concentration in sediment,

f_{toc} is the fraction of TOC, and

K_{oc} is the sediment OC-water partitioning coefficient.

While C_{sed} and f_{toc} are measured values in the sediment, the OC partitioning coefficients (K_{oc}) are most-often laboratory-derived values. The values published by Hansen et al., (1999) for K_{oc} were used in the model.

7.1.2 Two-Carbon Partitioning Model

Recent advances in the understanding of sediment partitioning have identified that the biological availability of hydrophobic contaminants in sediments, including PCBs, are affected by the nature of binding to native sediment organic matter types, especially to strongly sorbing black carbon, such as soot, coke, and charcoal (EPA, 2012; Ghosh et al., 2000, 2011).

The "two-carbon" partitioning model was developed to better predict freely dissolved HOCs in sediment porewater. This model requires measuring both the TOC fraction and the pyrogenic carbon ("black carbon") in the sediments. The "two-carbon" partitioning model applied to activated carbon (AC)-amended sediments has been demonstrated with site data to show that the higher chlorinated PCBs are more tightly sorbed (i.e., lower PCBs in porewater) with the addition of the black (activated) carbon (Beckingham and Ghosh, 2011; Werner et al., 2006; Gschwend et al., 2011, 2013).

The two-carbon partitioning model is expressed as (Koelmans et al., 2006):

$$C_{pw} \approx C_{sed} / (f_{oc} * K_{oc} + f_{bc} * K_{bc} * C_{pw}^{n-1})$$

Where,

C_{pw} is the estimated concentration of individual freely dissolved PCB congeners in porewater,

C_{sed} is the individual PCB congener concentration in sediment,

f_{oc} is the fraction in dry sediment of OC,

K_{oc} is the sediment OC-water partitioning coefficient,

f_{oc} is the fraction in dry sediment of OC, defined as fraction TOC – fraction black carbon (BC),

K_{bc} is the black carbon-normalized sorption coefficient for PCBs, and

n is the Freundlich exponent (assumed to be 0.7 after Lohmann et al. [2005] and Koelmans et al. [2006]) that captures the nonlinear dependency of the K_d values on the dissolved concentrations, C_{pw}, of the individual PCB congeners (Gschwend et al., 2013).

Specific parameters, data, and methods to run these calculations are listed in Section 7.2.

7.2 Parameters Used in the Partitioning Models

Total PCB congener concentrations were calculated using both the one-carbon and two-carbon partitioning models with two different PCB analytical methods used for input: Total PCB Aroclors via EPA Method 8082 and individual PCB congeners via EPA Method 1668c. The sources for the one-carbon and two-carbon partitioning models for the parameters listed above are presented in Table 7-1. The specific calculations and associated values are presented in Appendix M.

To evaluate impacts of PCB Aroclor detection limits on the calculated porewater and surface water concentrations, the one-carbon and two-carbon partitioning models were applied using both the RI Calc and FS Calc PCB data summation rules described in Section 4. The following combinations of data sets/model runs were conducted on sediment data reported by ALS (OC, PCB Aroclors, and PCB congeners in Table 5-1) and the MIT sediment data (OC and PCB congeners in Table 5-3):

1. ALS-measured Sediment Total PCB Aroclors Data (RI Calc) – Porewater concentration calculated using the one-carbon partitioning model
2. ALS-measured Sediment Total PCB Aroclors Data (FS Calc) – Porewater concentration calculated using the one-carbon partitioning model
3. ALS-measured Sediment Total PCB Aroclors Data (RI Calc) – Porewater concentration calculated using the two-carbon partitioning model
4. ALS-measured Sediment Total PCB Aroclors Data (FS Calc) – Concentration calculated using the two-carbon partitioning model
5. ALS-measured Sediment PCB Congener Data – (individual detected congeners only) – Porewater concentration calculated using the one-carbon partitioning model[8]
6. ALS-measured Sediment PCB Congener Data – (individual detected congeners only) – Porewater concentration calculated using the two-carbon partitioning model[9]
7. MIT-measured Sediment PCB Congener Data – (individual detected congeners only) – Porewater concentration calculated using the one-carbon partitioning model

[8] The Total PCB concentration in porewater was calculated by summing the calculated C_{pw} for each detected PCB congener using the one-carbon partitioning model.
[9] The total PCB concentration in porewater was calculated by summing the calculated C_{pw} for each detected PCB congener using the two-carbon partitioning model.

8. MIT-measured Sediment PCB Congener Data – (individual detected congeners only) – Porewater concentration calculated using the two-carbon partitioning model

7.3 Results from the Partitioning Model Calculations

The objective of this evaluation was to determine whether the partitioning models as applied to site sediment data could be used to predict PCB porewater concentrations in a way that could be used in the Recontamination Assessment and potentially applied during remedial design. Those modeling results are compared to the observed porewater concentration estimated from the MIT measure of sediment-exposed PE. These findings can only be used in a generalized way because there are only two measured data points against which to compare the model results.

The comparative results of calculated total PCBs in porewater based on PCBs measured in sediment are presented in Table 7-2, with supporting model inputs and outputs presented in Appendix M.

Table 7-2 shows three groups of measurements:

1. The sediment concentrations of total PCB Aroclors and total PCB congeners as reported by ALS and MIT (Table 5-1 and 5-3, respectively)
2. The calculated porewater total PCB concentrations by station in the combinations described above (Section 7.2)
3. The estimated porewater concentrations based on measured concentrations in sediment-exposed PE as reported by MIT for stations RM11E-PW001 and RM11E-PW004 (Section 6.2)

Table 7-2 provides the sediment PCB measures as Aroclors and congeners from the two laboratories for RM11E-PW001 and RM11E-PW004, and the one-carbon and two-carbon partitioning model predictions. The following observations are made on these limited data:

- RM11E-PW001
    - The total PCB porewater calculations made using the ALS-reported Aroclors (RI Calcs and FS Calcs) in the one-carbon partitioning model were 10 and 19 ng/L, respectively; relatively comparable to the estimated porewater concentration of 19 ng/L.
    - Using the same data in the two-carbon partitioning model, the modeled results were 1.6 and 2.9 ng/L, respectively; approximately an order of magnitude lower than the estimated porewater concentration (19 ng/L).
    - Using the individual detected congener data from ALS and MIT in the one-carbon partitioning model generated values of 217 and 138 ng/L; approximately 11 and 7.3 times, respectively, the estimated porewater concentration of 19 ng/L).
    - Using those same data in the two-carbon partitioning model, the modeled results were 35 and 41 ng/L, respectively, relatively comparable to the estimated porewater concentration of 19 ng/L.

- RM11E-PW004
    - The total PCB porewater calculations made using the ALS-reported Aroclors (RI Calcs and FS Calcs) in the one-carbon partitioning model were 58 and 169 ng/L; approximately 1.6 and 4.8 times, respectively, the estimated porewater concentration (35 ng/L).
    - Using the same data in the two-carbon partitioning model, the results were 38.8 and 115 ng/L; approximately 1.1 and 3.3 times, respectively, the estimated porewater concentration (35 ng/L).
    - For the individual detected congener data from ALS and MIT, the one-carbon partitioning model generated values of 746 and 838 ng/L; approximately 21 and 24 times, respectively, the estimated porewater concentration (35 ng/L).
    - Using those same data in the two-carbon partitioning model, the modeled results were 307 and 151 ng/L; approximately 8.8 and 4.3 times, respectively, the estimated concentration (35 ng/L).

The results show that no single equilibrium model consistently predicts porewater concentrations that match the estimated porewater concentrations from the sediment-exposed PE samples. Acknowledging that these are limited data, partitioning models can be used with available data to approximate porewater concentrations that may be usable for remedial planning, and the data from this study provide a preliminary understanding of the uncertainties with these calculated concentrations.

7.4 Derivation of Site-Specific Partitioning Coefficients

The modeled porewater concentrations of PCBs generated in the previous section were all calculated using literature-derived partitioning coefficients, specifically the sediment-OC (K_{oc}) values from Hansen et al. (1999). From the MIT data for sediment PCB congeners, OC, and PE-estimated porewater concentrations, site-specific K_{oc} values can be calculated for RM11E-PW001 and RM11E-PW004 using the one-carbon partitioning model equation, but solving for K_{oc} as follows:

$$K_{oc} = C_{sed} / (C_{pw} * f_{toc})$$

The site-specific Koc values were derived for all the detected congeners in the sediment PE-estimated porewater. These results are plotted in Figure 7-1 by congener with the literature-derived Log K_{oc} values from Hansen et al. (1999), as compared to the measured Log K_{oc} values for RM11E-PW001 and RM11E-PW004.

The results demonstrate that both RM11E-PW001 and RM11E-PW004 have higher site-specific K_{oc} values than noted in the literature. For the lower-chlorinated congeners, the site-specific values are approximately ½ to 1order-of-magnitude greater (the Y-axis is a log-scale), while for the higher-chlorinated congeners, the values are as much as 2 ½ orders-of-magnitude higher. These site-specific, measured K_{oc} values indicate a greater affinity for PCBs to stay sorbed to the sediment matrix as opposed to partitioning into porewater. These results also show that using

the literature, K_{oc} values for the model calculations made in Table 7-2 generally over-predict what was observed in the PE-estimated porewater concentrations.

One additional observation from Figure 7-1 is that the sediments at RM11E-PW004 have even a higher affinity to sorb and retain the PCBs than at RM11E-PW001. This increase in K_{oc} may be explained by the differences in black carbon at the two sites. The black carbon at RM11E-PW004 is an order-of-magnitude higher than that reported at RM11E-PW001 (Table 5-2); the site-specific K_{oc} values for the highest chlorinated PCB congeners at RM11E-PW004 are an order-of-magnitude greater than at RM11E- PW001.

Section 8. Limitations and Uncertainties

Passive porewater sampling is an evolving method that has just begun to move out of the major research institutes, where it is being developed. As described by EPA (2012), the method still has scientific challenges that limit its widespread acceptance including: understanding when equilibrium is reached, interpreting the meaning of contaminant accumulation in the samplers, and compiling scientifically sound partitioning values for a range of passive samplers. As yet, there are no commonly accepted standard methods for this sampling and analysis. The RM11E Group conducted this porewater study consistent with the methods in the SAP, the MIT SOPs, direct input from Dr. Gschwend, and with EPA's forthcoming Passive Sampler User's Manual (EPA and SERDP/ESTCP, in press). The one modification that was made to the method was the use of non-^{13}C labelled PRCs. Several key problems were encountered in the commercial laboratory that limited the reliability and usability of some of the reported data. These problems included:

- **Laboratory QA/QC.** The initial analysis performed by ALS did not meet the project's QA/QC requirements and was recalled by ALS, as described in letter from ALS to SEE dated January 7, 2015 (Appendix A). Laboratory issues identified by ALS included (1) method blank contamination, (2) high analyte concentration relative to the concentration of the added internal standards, and (3) co-extractable material from the field-exposed PE became significant after concentrating to 20 microliters (µL) and negatively impacted the performance of the HRMS instrument. Additional issues identified were: (1) the high RPD between field replicates, (2) higher PRC concentrations after recovery in the field (T_{final}) than the initial T_0 samples, and (3) higher PCB congener PE results than those reported by MIT. To address these issues, ALS developed a corrective action plan as discussed in Section 3.2.2 and re-analyzed the samples under this plan. As noted in Section 4, the ALS surface water-exposed PE results may receive further qualification in the final report.

- **PRC Recovery and Equilibrium**. The re-analyzed PE data were provided by ALS in February 2015. Although the data were considered valid by a third-party data validator in adherence with EPA SW-846 requirements, the PRC recoveries reported in the T_0 versus T_{final} ALS data from sediment-exposed PE showed uncharacteristic responses, including PRC concentrations that were higher in the T_{final} than the T_0 PE. To estimate porewater and surface water concentrations from concentrations measured in PE, the passive porewater method requires the ability to determine the relative state of equilibrium between the PE and the surrounding environment. As discussed in Sections 4 and 6, the sediment-exposed PE PRC data reported by ALS did not show the required depletion of PRCs (i.e., equilibration), and thus are unusable for estimating concentrations of PCB congeners in porewater. However, the ALS measurement results of PRCs in surface water–exposed PRCs and the split sample MIT measurements from two stations did show the required equilibration and those data

are usable for estimating concentrations of PCB congeners in surface water.

Given the uncharacteristic responses of the PRC recovery observed in the ALS sediment-exposed PE data, site-specific partitioning coefficients could only be established using the sediment-exposed PE results reported by MIT for stations RM11E-PW001 and RM11E-PW004. The conclusions in this report for porewater, therefore, are limited to data from two stations.

Section 9. Summary of Findings

Sampling of sediment, porewater, and surface water was conducted in accordance with the SAP. This sampling was designed to collect data on the potential migration of PCBs from sediment to porewater and porewater to surface water to inform future sediment cap modeling for the site, and potential groundwater recontamination pathway evaluations in the Recontamination Assessment. The principal objective of the sampling and analysis program was to develop site-specific sediment-water partitioning coefficients that could be used to inform remedial design.

As described in Section 4.2, difficulties were encountered with the porewater analytical methods that limited the usability of data to meet all of the outlined objectives for the study. The porewater and surface water sampling was performed using methodologies for passive sampling of HOCs that have recently been developed through university research and are only beginning to be implemented by commercial laboratories. The data collected provides some useful information for future evaluations of sediment cap and chemical transport models within the RM11E Project Area. A summary of the key findings from this study is provided below.

9.1 Estimation of Porewater and Surface Water Concentrations

The MIT measurements of the PRCs at RM11E-PW001 and RM11E-PW004 in both the sediment-exposed PE and the surface water-exposed PE show fractional losses that are consistent with the PRC Calculator; both the sediment-exposed PE and the surface water-exposed PE were used to estimate porewater and surface water PCB congener concentrations, as discussed in Sections 6.4 and 6.5.2.

The ALS measurements of the PRCs in the sediment-exposed PE showed fractional losses that were inconsistent with expectations and did not allow application of the PRC Calculator. As discussed in Sections 4.2 and 6.3, the ALS measurements of PCB congeners in the sediment-exposed PE could not be used to estimate porewater PCB congener concentrations. The ALS measurements of the PRCs in the surface water-exposed PE showed a fractional loss consistent with the PRC Calculator; estimates of PCB congeners in the surface water-exposed PE were used to estimate the dissolved-phase PCB congener concentrations, as presented in Section 6.5.1.

9.2 Site-Specific Partitioning Coefficients

As discussed in Sections 4 and 6, the MIT PE data were determined to be useable for the estimation of porewater and surface water PCB concentrations, and the resulting site-specific partitioning coefficients. It should be recognized that MIT analyzed only two samples (RM11E-PW001 and RM11E-PW004), and any conclusions drawn from these analyses should be interpreted and applied accordingly. The two MIT samples effectively bracketed the RM11E study site in that the sediment PCB concentrations at RM11E-PW001 were at the lower end of PCB Aroclor concentrations detected in sediment (82 µg/kg), while RM11E-PW004 had the

highest reported PCB Aroclors in sediment (1,260 µg/kg) among the seven porewater study stations.

The MIT data were considered to be sufficient to provide an estimate of site-specific partitioning coefficients for comparison to literature values. In Figure 7-1, the calculated equilibrium sediment-porewater partitioning coefficients (i.e., K_{oc}) for PCB congeners at these two RM11E-specific locations are up to 2 orders of magnitude higher than the commonly referenced literature values. The empirical data provides an indication that PCBs found in the bedded sediments have a much higher affinity to remain sorbed to site sediments than predicted using literature-based partitioning coefficients for congeners. These findings suggest that using literature-based partitioning coefficients for congeners to predict porewater concentrations from bedded sediment will overestimate actual porewater concentrations. This finding is consistent with results of other peer-reviewed literature on porewater investigations for HOCs at other sediment sites (Gschwend et al., 2011, 2013; SEA Engineering 2014; Fernandez et al., 2012; Ghosh et al., 2014; Tomaszweski and Luthy, 2008).

Acknowledging that the findings of this study are based on limited data, the estimated porewater concentrations are less than or similar to concentrations predicted by the standard model assumptions. Therefore, it is concluded that partitioning models can be used with available data to approximate porewater concentrations that will be usable for remedial planning, including input into sediment cap isolation models in the Recontamination Assessment Report.

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Table 2-1
Coordinates: Proposed and Actual Sample Locations

Passive Sampling Station ID	Proposed Station Coordinates[1]		Actual Station Coordinates[1]		Approximate Mudline Elevation[2,3]	Depth Measurement Method	Distance from Proposed to Actual Sample Location (ft)
	Northing	Easting	Northing	Easting			
RM11E-PW001	689302.7	7643999.7	689314.6	7644008.7	-39.8	Pneumofathometer	15.0
RM11E-PW002	689344.3	7644176.0	689353.1	7644175.4	-6.8	Lead line	8.8
RM11E-PW003	689248.6	7644329.2	689248.6	7644329.2	-4.5	Lead line	0.0
RM11E-PW004	689168.3	7644261.4	689168.3	7644261.4	-27.2	Lead line	0.0
RM11E-PW005	689072.9	7644163.4	689072.9	7644163.4	-35.6	Lead line	0.0
RM11E-PW006	689004.6	7644579.4	689006.2	7644584.6	-16.7	Lead line	5.4
RM11E-PW007	687388.4	7645488.7	687388.5	7645474.3	-40.2	Lead line	14.4

Notes:

[1] Northing and easting coordinates exist in the following coordinate system: North American Datum of 1983 (NAD83), Oregon State Plane North Zone, International Feet.

[2] Elevations exist in the following coordinate system: North American Vertical Datum of 1988 (NAVD88) in units of feet.

[3] Mudline elevations were calculated by subtracting the water depth measured in the field from the Willamette River stage elevation, which is recorded on a 15-minute basis from U.S. Geological Survey (USGS) station number 14211720 (USGS, 2014). This USGS station is located on the upstream side of the Morrison Bridge (RM 12.8). River stage elevation data reported by USGS are corrected to NAVD88 at RM 11 by adding 5.05 feet to the USGS reading.

Table 2-2
Performance Reference Compound Loading Designation Based on Estimated Porewater Concentration

Passive Sampling Station ID	Existing Sediment Sample ID	Measured Total PCB Aroclors (µg/kg)	Estimated Max Porewater PCB Congener Concentration[1] (ng/L)	PRC Loading Designation
RM11E-PW001	LW3-UG02	5,900	341.2	High
RM11E-PW002	RM11E-G022	133	1.6	Low
RM11E-PW003	RM11E-G026	1,400	25.1	High
RM11E-PW004	RM11E-G027	133	4.8	Low
RM11E-PW005	RM11E-G028	373	4.2	Low
RM11E-PW006	RM11E-G033	2,000	105.0	High
RM11E-PW007	RM11E-C043	1.7 U	not calculated	Low

Notes:

PCB = Polychlorinated Biphenyl

PRC = Performance Reference Compound

[1] Using the Frame et al. (1996) table of PCB congener compositions in weight percent of PCB Aroclors, the individual congener concentrations in sediment were estimated. From each estimated congener concentration, the estimate in porewater was determined using the standard equilibrium partitioning equation (C_{sed} *1000/fraction t_{oc}*K_{oc}). The estimated highest single PCB congener is reported in this table.

Table 2-3
Passive Sampler Loading and Time Zero (T_0) Polyethylene Sample Inventory

Passive Sampler Loading and Identification					Polyethylene (PE) Time Zero (T_0) Sample Inventory					
Passive Sampling Station ID	PRC Loading Designation	Sampler	Sampler Frames	PRC Load ID	Sample Date	Sample Time	Sample ID	Number of Containers	PCB Congeners	Frozen Archival
RM11E-PW001	High	A	A0, A1	062314-H1	08/17/14	10:38	RM11E-PW001 A T_0	1	✓	
		B	A2,A4	062314-H2			RM11E-PW001 B T_0	1		✓
RM11E-PW002	Low	A	A5, A6	062314-L1	08/17/14	11:08	RM11E-PW002 A T_0	1	✓	
		B	A7, A8	062314-L2			RM11E-PW002 B T_0	1		✓
RM11E-PW003	High	A	A9, A10	062314-H4	08/17/14	11:33	RM11E-PW003 A T_0	1	✓	
		B	A11, A12	062314-H5			RM11E-PW003 B T_0	1		✓
RM11E-PW004	Low	A	A13, A14	062314-L3	08/17/14	12:02	RM11E-PW004 A T_0	1	✓	
		B	A15, A16	062314-L4			RM11E-PW004 B T_0	1		✓
RM11E-PW005	Low	A	A17, A18	062314-L5	08/17/14	12:26	RM11E-PW005 A T_0	1	✓	
		B	A19, A20	062314-L6			RM11E-PW005 B T_0	1		✓
RM11E-PW006	High	A	A21, A22	062314-H6	08/17/14	12:40	RM11E-PW006 A T_0	1	✓	
		B	A23, A24	062314-H7			RM11E-PW006 B T_0	1		✓
RM11E-PW007	Low	A	A25, A26	062314-L7	08/17/14	13:02	RM11E-PW007 A T_0	1	✓	
		B	A27, A28	062314-L8			RM11E-PW007 B T_0	1		✓

Notes:

PCB = Polychlorinated Biphenyl

PRC = Performance Reference Compound

Table 2-4
Passive Sampler Processing and Sample Inventory

Passive Sampling Station ID	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample Date	Sample Time	Sample ID	Number of Containers	PCB Congeners	Frozen Archival	MIT
RM11E-PW001	A	30	15	10/20/2014	11:35	Sediment - RM11E-PWP001 A	2	✓		✓
						Water – RM11E-PWW001 A	2	✓		✓
	B	30	15			Sediment - RM11E-PWP001 B	2		✓	
						Water – RM11E-PWW001 B	2		✓	
RM11E-PW002	A	28	17	10/20/2014	10:18	Sediment - RM11E-PWP002 A	2	✓	✓	
						Water – RM11E-PWW002 A	2	✓	✓	
	B	27	19			Sediment - RM11E-PWP002 B	1		✓	
						Water – RM11E-PWW002 B	1		✓	
RM11E-PW003	A	28	17	10/20/2014	18:14	Sediment - RM11E-PWP003 A	2	✓	✓	
						Water – RM11E-PWW003 A	2	✓	✓	
	B	25	20			Sediment - RM11E-PWP003 B	1		✓	
						Water – RM11E-PWW003 B	1		✓	
RM11E-PW004	A	29.5	15.5	10/20/2014	13:05	Sediment - RM11E-PWP004 A	2	✓		✓
						Water – RM11E-PWW004 A	2	✓		✓
	B	29	16			Sediment - RM11E-PWP004 B	1		✓	
						Water – RM11E-PWW004 B	1		✓	
RM11E-PW005	A	32	13	10/20/2014	15:08	Sediment - RM11E-PWP005 A	2	✓	✓	
						Water – RM11E-PWW005 A	2	✓	✓	
	B	31	14			Sediment - RM11E-PWP005 B	1		✓	
						Water – RM11E-PWW005 B	1		✓	
RM11E-PW006	A	30	15	10/20/2014	10:12	Sediment - RM11E-PWP006 A	2	✓	✓	
						Water – RM11E-PWW006 A	2	✓	✓	
	B	29	16			Sediment - RM11E-PWP006 B	1		✓	
						Water – RM11E-PWW006 B	1		✓	
RM11E-PW007	A	8-17 [1]	37 - 28 [1]	10/20/2014	16:40	Sediment - RM11E-PWP007 A	1		✓	
						Water – RM11E-PWW007 A	1	✓	✓	
	B	***No Sample***								
RM11E-PW504[2]	Field Replicate			10/20/14	13:05	Sediment - RM11E-PWP504	1	✓		
						Water – RM11E-PWW504	1	✓		

Notes:
MIT = Massachusetts Institute of Technology
PCB = Polychlorinated Biphenyl
PRC = Performance Reference Compound
[1] Sampler was placed into the river bottom at a sharp angle and thus a range of exposure depths are listed. The polyethylene (PE) was cut at an angle along the visible interface.
[2] Field duplicate of RM11E-PW004.

Table 2-5
Sediment Sample Inventory

Passive Sampling Station ID	Sediment Sample ID	Sample Date	Sample Time	Sample Start Depth (cm)	Sample End Depth (cm)	Number of Containers	PCB Congeners	PCB Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
RM11E-PW001	RM11E PW001 - SED	10/20/2014	11:35	0	25.4	5	✓	✓	✓	✓	✓	✓	✓
RM11E-PW002	RM11E PW002 - SED	10/20/2014	10:18	0	30.5	6	✓	✓	✓	✓	✓	✓	
RM11E-PW003	RM11E PW003 - SED	10/20/2014	18:14	0	24.4	4	✓	✓	✓	✓	✓		
RM11E-PW004	RM11E PW004 - SED	10/20/2014	13:05	0	30.5	6	✓	✓	✓	✓	✓		✓
RM11E-PW005	RM11E PW005 - SED	10/20/2014	15:08	0	30.5	4	✓	✓	✓	✓	✓		
RM11E-PW006	RM11E PW006 - SED	10/20/2014	10:12	0	30.5	4	✓	✓	✓	✓	✓	✓	
RM11E-PW504[1]	RM11E PW504 - SED	10/20/2014	13:05	0	30.5	7	✓	✓	✓	✓	✓		

Notes:
MIT = Massachusetts Institute of Technology
PCB = Polychlorinated Biphenyl
[1] Field duplicate of RM11E-PW004.

Table 3-1
Performance Reference Compound Loading Calibration Test

Measured Mass PRC Compounds after 45 Days Loadings

PRC Congener	Homolog Group		PRC High Load (µg/kg PE)				PRC Low Load (µg/kg PE)			
			Target Load	Measured-Load			Target Load	Measured-Load		
				Test 1	Test 2	Test 3		Test 1	Test 2	Test 3
PCB 28	3-Cl		28,378	24,800	27,200	24,400	946	918	999	977
PCB 47	4-Cl		28,378	18,500	21,600	19,200	946	768	742	795
PCB 54	4-Cl		28,378	25,300	25,600	24,600	946	1,070	1,090	1,070
PCB 97	5-Cl		28,378	17,100	20,900	18,300	946	655	636	884
PCB 111	5-Cl		28,378	20,800	26,800	22,500	946	719	726	1,220
PCB 153	6-Cl		28,378	21,300	25,600	22,100	946	695	724	1,300

Estimated PRCs in Porewater[2] based on 45 Days Loadings

PRC Congener	Homolog Group	K_{pew} [1]	PRC High Load (ng/L)				PCB - Low Load (ng/L)			
			Target Load	Test 1	Test 2	Test 3	Target Load	Test 1	Test 2	Test 3
PCB 28	3-Cl	5.383	117.48	102.67	112.61	101.02	3.92	3.80	4.14	4.04
PCB 47	4-Cl	5.563	77.62	50.60	59.08	52.52	2.59	2.10	2.03	2.17
PCB 54	4-Cl	4.923	338.83	302.08	305.66	293.72	11.29	12.78	13.01	12.78
PCB 97	5-Cl	6.003	28.18	16.98	20.76	18.17	0.94	0.65	0.63	0.88
PCB 111	5-Cl	6.473	9.55	7.00	9.02	7.57	0.32	0.24	0.24	0.41
PCB 153	6-Cl	6.633	6.61	4.96	5.96	5.15	0.22	0.16	0.17	0.30
Target/Load Sum PRC PCB Congeners			**578.27**	**484.29**	**513.09**	**478.14**	**19.28**	**19.73**	**20.22**	**20.59**

Notes:

PCB = Polychlorinated Biphenyl

PE = Polyethylene

PRC = Performance Reference Compound

[1] K_{pew} = Polyethylene-water partitioning coefficient

[2] Porewater concentration estimated as follows: $C_{pw}\left[\frac{ng}{L}\right] = \left(\frac{PRC\ Load\ [\frac{\mu g}{kgPE}]}{K_{pe}\ [\frac{L}{kgPE}]}\right) \times 1000\ \frac{ng}{\mu g}$

Table 3-2
Initial Performance Reference Compound Concentration by Test Location

Measured PRC Compounds at T_0

PRC Congener	Homolog Group		Measured Initial High Load in PE (µg/kg)					Measured Initial Low Load in PE (µg/kg)					
			PRC High Load (µg/kg PE)					PRC Low Load (µg/kg PE)					
			Target Load	RM11E-PW001-A	RM11E-PW001-B[2]	RM11E-PW003-A	RM11E-PW006-A	Target Load	RM11E-PW002-A	RM11E-PW004-A	RM11E-PW004-B[2,3]	RM11E-PW005-A	RM11E-PW007-A
PCB 28	3-Cl		28,378	16,100	19,900	17,800	17,700	946	717	613	655	669	618
PCB 47	4-Cl		28,378	15,100	15,200	15,800	16,200	946	660	557	536	607	556
PCB 54	4-Cl		28,378	13,500	23,200	14,800	15,300	946	564	548	782	515	522
PCB 97	5-Cl		28,378	17,700	18,300	20,600	20,600	946	890	690	621	834	729
PCB 111	5-Cl		28,378	22,600	22,900	28,900	30,200	946	1,190	810	794	1,060	987
PCB 153	6-Cl		28,378	20,000	20,200	29,500	31,800	946	1,210	776	795	1,030	1,020
PCB 178	7-Cl		28,378	18,500	17,800	30,000	32,000	946	1,210	732	759	966	966

Estimated PRCs in Porewater Based on T_0 Loadings

PRC Congener	Homolog Group	K_{pew}[1]	PCB - High Load (ng/L)					PCB - Low Load (ng/L)					
			Target Load	RM11E-PW001-A	RM11E-PW001-B[2]	RM11E-PW003-A	RM11E-PW006-A	Target Load	RM11E-PW002-A	RM11E-PW004-A	RM11E-PW004-B[2,3]	RM11E-PW005-A	RM11E-PW007-A
PCB 28	3-Cl	5.383	117.48	66.65	82.39	73.69	73.28	3.92	2.97	2.54	2.71	2.77	2.56
PCB 47	4-Cl	5.563	77.62	41.30	41.58	43.22	44.31	2.59	1.81	1.52	1.47	1.66	1.52
PCB 54	4-Cl	4.923	338.83	161.19	277.01	176.71	182.68	11.29	6.73	6.54	9.34	6.15	6.23
PCB 97	5-Cl	6.003	28.18	17.58	18.17	20.46	20.46	0.94	0.88	0.69	0.62	0.83	0.72
PCB 111	5-Cl	6.473	9.55	7.61	7.71	9.73	10.16	0.32	0.40	0.27	0.27	0.36	0.33
PCB 153	6-Cl	6.633	6.61	4.66	4.70	6.87	7.40	0.22	0.28	0.18	0.19	0.24	0.24
PCB 178	7-Cl	6.853	3.98	2.60	2.50	4.21	4.49	0.13	0.17	0.10	0.11	0.14	0.14
Target/Load Sum PRC PCB Congeners (ng/L)			**582.25**	**301.58**	**434.05**	**334.88**	**342.78**	**19.41**	**13.24**	**11.85**	**14.69**	**12.14**	**11.74**

Notes:
PCB = Polychlorinated Biphenyl
PE = Polyethylene
PRC = Performance Reference Compound
[1]K_{pew} = Polyethylene-water partitioning coefficient
[2]PW001 and PW004 were analyzed for both the "A" and "B" replicates. The "B" replicate T_0 result will be used for comparison to the T_{final} results for those stations
[3]T_0 for PW004 will also be used to compare to the T_{final} field duplicate sample PW504 B.

Table 3-3
Polyethylene Analysis by Station and Data Package

Passive Sampling Station ID	Lab	Field Rep	T_0 PE	T_{final} Porewater	T_{final} Surface Water	Data Package(s)	Analysis Date[1]	Comments
RM11E-PW001	ALS	B	✓	✓	✓	T_0 data K1501568 T_{final} data K1411748.02	T_0 data 2/2015 T_{final} data 2/2015	---
	MIT	A	NA	✓	✓	PCB PE Data MIT 6931411	T_{final} data 11/2014	---
RM11E-PW002	ALS	A	✓	✓	✓	T_0 data K1408725.01 T_{final} data K1411748.02	T_0 data 9/2014 T_{final} data 2/2015	---
RM11E-PW003	ALS	A	✓	✓	✓	T_0 data K1408725.01 T_{final} data K1411748.02	T_0 data 9/2014 T_{final} data 2/2015	---
RM11E-PW004	ALS	B	✓	✓	✓	T_0 data K1501568 T_{final} data K1411748.02	T_0 data 2/2015 T_{final} data 2/2015	---
	MIT	A	NA	✓	✓	PCB PE Data MIT 6931411	T_{final} data 11/2014	---
RM11E-PW005	ALS	A	✓	✓	✓	T_0 data K1408725.01 T_{final} data K1411748.02	T_0 data 9/2014 T_{final} data 2/2015	---
RM11E-PW006	ALS	A	✓	✓	✓	T_0 data K1408725.01 T_{final} data K1411748.02	T_0 data 9/2014 T_{final} data 2/2015	---
RM11E-PW007	ALS	A	✓	NA	✓	T_0 data K1408725.01 T_{final} data K1411748.01	T_0 data 9/2014 T_{final} data 11/2014	---
RM11E- PW504	ALS	B	✓	NA	✓	T_0 data K1408725.01 T_{final} data K1411748.01	T_0 data 2/2015 T_{final} data 2/2015	Duplicate of RM11E-PW004

Notes:

NA = Not Analyzed

PE = Polyethylene

[1]Analysis date is for validated data.

T_0 = Time Zero (Time of Deployment)

T_{final} = Time Final (Time of Retrieval)

Table 3-4
Sediment Analyses by Station and Data Package

Passive Sampling Station ID	Lab	TS	TOC	Black Carbon	PCB Congeners	PCB Aroclors	Data Package(s)
RM11E-PW001	ALS	✓	✓	✓	✓	✓	K1411753.02
	MIT	✓	✓	✓	✓	✓	Sediment Data MIT 6931411
RM11E-PW002	ALS	✓	✓	✓	✓	NA	K1411753.02
RM11E-PW003	ALS	✓	✓	✓	✓	✓	K1411753.02
RM11E-PW004	ALS	✓	✓	✓	✓	✓	K1411753.02
	MIT	✓	✓	NA	✓	NA	Sediment Data MIT 6931411
RM11E-PW005	ALS	✓	✓	✓	✓	✓	K1411753.02
RM11E-PW006	ALS	✓	✓	✓	✓	✓	K1411753.02
RM11E-PW504	ALS	✓	✓	✓	✓	✓	K1411753.02

Note:

NA = Not Analyzed

TS = Total Solids

PCB = Polychlorinated Biphenyl

TOC = Total organic carbon

Table 5-1
Bulk Sediment Results

Analyte	Sample ID / Unit	RM11E-PW001-SED	RM11E-PW002-SED	RM11E-PW003-SED	RM11E-PW004-SED	RM11E-PW005-SED	RM11E-PW006-SED
Conventionals							
Total solids	percent	76.5	60.6	60.7	74.4 T	70.5	66.5
Total organic carbon	percent	0.385	2.51	2.63	1.16 T	0.954	0.924
Black carbon	percent	0.18 U	0.17 J	4.66	0.16 UT	0.18 U	0.18 U
Grain Size							
Clay	percent	0.97	7.84	14.91	1.55 T	5.3	12.16
Silt	percent	3.29	18.09	37.26	4.01 T	10.2	44.43
Very fine sand	percent	5.2	22.56	9.54	8.73 T	5.55	30.55
Fine sand	percent	19.94	24.99	5.7	31.05 T	13.81	12.88
Medium sand	percent	39.47	10.84	3.26	27.22 T	10.61	0.26
Coarse sand	percent	16.1	2.19	1.55	7.75 T	8.6	0.06
Very coarse sand	percent	5.16	1.46	1.69	3.29 T	3.84	0
Gravel	percent	8.03	7.46	34.41	18.31 T	49.83	0
Aroclors							
Aroclor 1016	µg/kg	7.4 UJ	22 U	25 U	38 UT	17 U	2.1 U
Aroclor 1221	µg/kg	2.1 U	7.2 U	12 U	15 UT	6.5 U	2.1 U
Aroclor 1232	µg/kg	9.8 U	130 U	87 U	55 UT	20 U	2.1 U
Aroclor 1242	µg/kg	5.4 U	60 U	62 U	97 UT	23 U	2.1 U
Aroclor 1248	µg/kg	6.9 U	62 U	37 U	280 UT	14 U	2.1 U
Aroclor 1254	µg/kg	6.6 U	27 U	48 U	44 UT	28 U	2.1 U
Aroclor 1260	µg/kg	82 J	170	120	1260 T	55	2.1 U
RI Calc Total PCB Aroclors	µg/kg	82 JT	170 T	120 T	1260 T	55 T	2.1 UT
FS Calc Total PCB Aroclors	µg/kg	101 JT	324 T	256 T	1520 T	109 T	2.1 UT
PCB Congeners							
PCB 1	µg/kg	0.0126 U	0.1 J	0.178	0.178 T	0.0439 U	0.0573 U
PCB 2	µg/kg	0.0133 U	0.0331 J	0.044 U	0.0143 UT	0.0339 U	0.038 U
PCB 3	µg/kg	0.0143 U	0.0494 J	0.185	0.0378 JT	0.0932	0.0206 U
PCB 4	µg/kg	0.259 U	3.87	0.645 U	30.5 T	0.458 U	0.752 U
PCB 5	µg/kg	0.0709 U	0.0988 U	0.151 U	0.0679 UT	0.13 U	0.117 U
PCB 6	µg/kg	0.0704 U	0.191	0.346	0.313 T	0.13 U	0.117 U
PCB 7	µg/kg	0.0654 U	0.0912 U	0.139 U	0.164 T	0.12 U	0.108 U
PCB 8	µg/kg	0.0667 U	0.46	1.21	0.731 T	0.298	0.111 U
PCB 9	µg/kg	0.0717 U	0.1 U	0.153 U	0.0687 UT	0.132 U	0.119 U
PCB 10	µg/kg	0.166 U	0.171 U	0.29 U	0.451 T	0.208 U	0.29 U
PCB 11	µg/kg	0.0746 U	0.104 U	0.402	1.14 T	0.137 U	0.242
PCBs 12 + 13	µg/kg	0.0716 U	0.0999 U	0.153 U	0.0687 UT	0.132 U	0.119 U
PCB 14	µg/kg	0.0723 U	0.101 U	0.154 U	0.0694 UT	0.133 U	0.12 U
PCB 15	µg/kg	0.0787 U	0.255	0.833	0.221 T	0.223	0.0743 U
PCB 16	µg/kg	0.0487 U	0.286	0.541	0.257 JT	0.226	0.0455 U
PCB 17	µg/kg	0.632	3.74	1.15	43.8 T	0.36 J	0.0395 U
PCB 18	µg/kg	0.0303 U	0.0337 U	0.0565 U	0.0239 UT	0.0382 U	0.0283 U
PCB 19	µg/kg	2.79	10.7	0.827	106 JT	0.255	0.0659 J
PCBs 20 + 28	µg/kg	0.549	6.5	8.65	12.3 T	3.17	0.0332 U
PCBs 21 + 33	µg/kg	0.235	1.44	3.37	3.82 JT	1.21	0.0272 U
PCB 22	µg/kg	0.0212 U	0.298	0.775	0.138 T	0.434	0.0186 U
PCB 23	µg/kg	0.0202 U	0.0691 U	0.0344 U	0.0437 UT	0.0281 U	0.0177 U
PCB 24	µg/kg	0.0284 U	0.0316 U	0.0531 U	0.0224 UT	0.0358 U	0.0266 U
PCB 25	µg/kg	0.128	0.624	0.428 J	1.35 T	0.158 J	0.0142 U
PCBs 26 + 29	µg/kg	0.0835	0.785	0.764	2.14 T	0.462	0.0189 U
PCB 27	µg/kg	0.291	1.25	0.362 J	9.57 T	0.0785 J	0.0297 U
PCB 30	µg/kg	0.162	1.47	1.81	4.36 T	0.792	0.0385 U
PCB 31	µg/kg	0.103	1.54	2.73	2.63 T	1.38	0.0174 U
PCB 32	µg/kg	0.462	5.44	3.18	13.1 T	0.387	0.0267 U
PCB 34	µg/kg	0.0233 U	0.0796 U	0.0396 U	0.0503 UT	0.0324 U	0.0204 U
PCB 35	µg/kg	0.0228 U	0.078 U	0.0388 U	0.0493 UT	0.0317 U	0.02 U
PCB 36	µg/kg	0.0211 U	0.0719 U	0.0358 U	1.15 T	0.0293 U	0.0185 U
PCB 37	µg/kg	0.0268 U	0.294 J	0.927	0.117 T	0.371	0.0238 U
PCB 38	µg/kg	0.0234 U	0.08 U	0.0398 U	0.0506 UT	0.0326 U	0.0205 U
PCB 39	µg/kg	0.0199 U	0.068 U	0.137	0.043 UT	0.0277 U	0.0175 U
PCBs 40 + 71	µg/kg	1.57	4.41	4.55	12.5 T	1.35	0.0244 U
PCB 41	µg/kg	0.591	1.7	0.0592 U	0.0319 UT	0.263 J	0.0333 U
PCB 42	µg/kg	0.289 J	0.907	1.15	1.7 T	0.455	0.0233 U
PCBs 43 + 73	µg/kg	0.0348 U	0.0336 U	0.0412 U	0.0222 UT	0.0346 U	0.0232 U
PCBs 44 + 47 + 65	µg/kg	21.6	53	33.8	145 T	5.45	0.0671 U
PCBs 45 + 51	µg/kg	10.4	37	21.6	106 T	2.13	0.0315 J
PCB 46	µg/kg	0.211 J	1.49	0.862	3.46 T	0.205 J	0.0323 U
PCB 48	µg/kg	0.0385 U	0.0372 U	0.0456 U	0.0246 UT	0.316 J	0.0256 U
PCB 49	µg/kg	10.2	32.8	26.9	69.7 T	6.94	0.0255 U
PCBs 50 + 53	µg/kg	7.22	26.8	15	77.7 T	2.62	0.026 U
PCB 52	µg/kg	8.25	25.7	22.7	79 T	9.78	0.0324 U
PCB 54	µg/kg	1.64	6.78	4.1	26.1 T	0.249	0.0354 U

Table 5-1
Bulk Sediment Results

Analyte	Sample ID / Unit	RM11E-PW001-SED	RM11E-PW002-SED	RM11E-PW003-SED	RM11E-PW004-SED	RM11E-PW005-SED	RM11E-PW006-SED
PCB 55	µg/kg	0.0443 U	0.0429 U	0.0525 U	0.0283 UT	0.0441 U	0.0295 U
PCB 56	µg/kg	0.126 J	0.346	2.14	0.221 T	1.12	0.0167 U
PCB 57	µg/kg	0.0328 U	0.0317 U	0.0389 U	0.0209 UT	0.0326 U	0.0219 U
PCB 58	µg/kg	0.0314 U	0.0304 U	0.0372 U	0.02 UT	0.0312 U	0.0209 U
PCBs 59 + 62 + 75	µg/kg	0.389 J	1.24	1.25	3.58 T	0.321	0.0198 U
PCB 60	µg/kg	0.0411 J	0.0744	0.272	0.0422 UT	0.202 J	0.0161 U
PCB 61	µg/kg	0.0339 U	0.0328 U	0.0402 U	0.0217 UT	0.0338 U	0.0226 U
PCB 63	µg/kg	0.0324 U	0.282	0.249	0.22 T	0.101	0.0216 U
PCB 64	µg/kg	0.202	0.534	1.25	0.827 T	0.674	0.0149 U
PCB 66	µg/kg	1.33	2.61	7.42	3.1 T	3.13	0.0272 U
PCB 67	µg/kg	0.0286 U	0.0277 U	0.0339 U	0.0183 UT	0.0628	0.0191 U
PCB 68	µg/kg	0.11	0.554 J	0.896	0.69 JT	0.0918 J	0.0186 U
PCB 69	µg/kg	0.0241 U	0.0233 U	0.0285 U	0.0154 UT	0.0239 U	0.016 U
PCBs 70 + 74 + 76	µg/kg	1.24	2.34	8.08	2.54 T	3.65	0.0183 U
PCB 72	µg/kg	0.0299 U	0.185 J	0.485	0.198 JT	0.0743 J	0.0199 U
PCB 77	µg/kg	0.0832 J	0.117 J	0.317 J	0.08 JT	0.167	0.015 U
PCB 78	µg/kg	0.0237 U	0.0417 U	0.0562 U	0.0452 UT	0.0274 U	0.0172 U
PCB 79	µg/kg	0.0453	0.0721 J	0.218	0.04 UT	0.0584 J	0.0152 U
PCB 80	µg/kg	0.0195 U	0.0343 U	0.0462 U	0.0372 UT	0.0226 U	0.0142 U
PCB 81	µg/kg	0.0215 U	0.0383 U	0.0546 U	0.0846 JT	0.0312 U	0.0175 U
PCB 82	µg/kg	0.723 J	0.16	0.749	0.116 UT	0.297 J	0.0439 U
PCBs 83 + 99	µg/kg	6.71	5.85	11.5	10.91 T	4.58	0.0337 U
PCB 84	µg/kg	1.79	1.08	2.19 J	1.52 JT	0.85	0.0331 U
PCB 85	µg/kg	3.66 J	1.65	2.26	1.65 JT	0.793	0.0369 U
PCBs 86 + 87 + 97 + 109 + 119 + 125	µg/kg	7.04	4.48	7.62	8.03 T	3.06	0.0284 U
PCB 88	µg/kg	0.0266 U	0.0431 U	0.0431 U	0.0276 UT	0.0371 U	0.0305 U
PCB 89	µg/kg	0.114 U	0.0655 U	0.159 U	0.0982 UT	0.0415 U	0.0374 U
PCBs 90 + 101 + 113	µg/kg	14	15	24.7	18.5 T	8.1	0.03 U
PCB 91	µg/kg	8.52	11.6	8.83	22.1 T	2.26	0.0261 U
PCB 92	µg/kg	2.69	4.01	6.46	4.69 T	2.15	0.0351 U
PCB 93	µg/kg	0.0268 U	0.0434 U	0.0435 U	0.0278 UT	0.0373 U	0.0307 U
PCB 94	µg/kg	0.699 J	1.86	1.2	2.67 T	0.0974 J	0.0285 U
PCBs 95 + 100	µg/kg	13.7	17	17.8	33 T	6.41	0.0259 U
PCB 96	µg/kg	1.39 J	2.44	1.33	4.98 T	0.273	0.0215 U
PCBs 98 + 102	µg/kg	0.624 J	1.04	0.685	1.97 T	0.228 J	0.0244 U
PCB 103	µg/kg	1.57	3.28	2.01	5.71 T	0.834	0.0262 U
PCB 104	µg/kg	0.471	1.13	1.13 J	3.14 T	0.104	0.0355 U
PCB 105	µg/kg	2.52	0.684	2.14	0.51 JT	1.05	0.0175 U
PCB 106	µg/kg	0.0378 U	0.0518 U	0.118 U	0.0212 UT	0.0583 U	0.0189 U
PCB 107	µg/kg	0.565	0.536	1.24 J	0.738 T	0.539	0.0197 U
PCBs 108 + 124	µg/kg	0.351	0.0487 U	0.111 U	0.0593 JT	0.0548 U	0.0178 U
PCBs 110 + 115	µg/kg	8.41	4.93	12.5	5.47 T	4.36	0.0215 U
PCB 111	µg/kg	0.0726 U	0.0599 J	0.102 U	0.139 T	0.0266 U	0.024 U
PCB 112	µg/kg	0.0767 U	0.0444 U	0.108 U	0.0665 UT	0.0281 U	0.0254 U
PCB 114	µg/kg	0.143	0.0459 U	0.11 U	0.109 T	0.0493 U	0.0162 U
PCBs 116 + 117	µg/kg	0.978	1.32	0.827	2.25 T	0.122 J	0.0251 U
PCB 118	µg/kg	6.46	2.48	8.41	2.13 T	3.49	0.0156 U
PCB 120	µg/kg	0.0725 U	0.0419 U	0.102 U	0.369 T	0.0266 U	0.024 U
PCB 121	µg/kg	0.116 J	0.286	0.267	0.792 T	0.0674	0.0234 U
PCB 122	µg/kg	0.0909	0.0578 U	0.132 U	0.0549 JT	0.0651 U	0.0211 U
PCB 123	µg/kg	0.0876	0.0452 U	0.121 U	0.0211 UT	0.0632 U	0.0211 U
PCB 126	µg/kg	0.173 J	0.172 J	0.648 J	0.523 JT	0.143 J	0.0175 U
PCB 127	µg/kg	0.0382 U	0.0523 U	0.119 U	0.0229 JT	0.0589 U	0.0191 U
PCB 128	µg/kg	1.83	0.715	2.97	0.698 T	0.647	0.0264 U
PCBs 129 + 138 + 163	µg/kg	21.1	17.1	46.2	22 T	6.89	0.0307 U
PCB 130	µg/kg	0.855	0.437	1.6 J	0.476 T	0.428	0.0336 U
PCB 131	µg/kg	0.126	0.0472 U	0.119 U	0.0422 UT	0.0397 U	0.0247 U
PCB 132	µg/kg	5.02	3.78	11.7	4.05 T	2.35	0.0292 U
PCB 133	µg/kg	0.436	0.914	2.27	1.9 T	0.521	0.0294 U
PCB 134	µg/kg	0.633	0.52	1.27	0.843 T	0.313	0.025 U
PCBs 135 + 154	µg/kg	1.6	2.43	5.8	5.1 JT	1.65	0.0232 U
PCB 136	µg/kg	3.54	4.34	5.66	6.41 T	1.62	0.0205 U
PCB 137	µg/kg	0.659	0.0488 U	0.509 J	0.415 JT	0.125 J	0.0256 U
PCBs 139 + 140	µg/kg	0.281	0.0482 U	0.558	0.56 T	0.262	0.0253 U
PCB 141	µg/kg	2.78	2.33	9	2.99 T	0.943	0.0274 U
PCB 142	µg/kg	0.0707 U	0.0563 U	0.142 U	0.0503 UT	0.0473 U	0.0295 U
PCB 143	µg/kg	0.0676 U	0.0538 U	0.135 U	0.0481 UT	0.0452 U	0.0282 U
PCB 144	µg/kg	0.372 J	0.383 J	1.36	0.5 JT	0.153 J	0.0254 U
PCB 145	µg/kg	0.0199 U	0.0199 U	0.0354 U	0.017 UT	0.0345 U	0.0191 U
PCB 146	µg/kg	2.91	4.2	12.3	5.63 T	2.95	0.0264 U

Table 5-1
Bulk Sediment Results

Analyte	Sample ID / Unit	RM11E-PW001-SED	RM11E-PW002-SED	RM11E-PW003-SED	RM11E-PW004-SED	RM11E-PW005-SED	RM11E-PW006-SED
PCBs 147 + 149	µg/kg	17.7	20.8	44.5	37.5 T	9.16	0.025 U
PCB 148	µg/kg	0.207	0.425	0.82 J	0.719 JT	0.113	0.0268 U
PCB 150	µg/kg	0.394	0.558	0.573	1.2 JT	0.221 J	0.0174 U
PCB 151	µg/kg	6.12	7.16	13.8	9.45 T	2.37	0.0294 U
PCB 152	µg/kg	0.563	0.663	0.44	1.72 T	0.0382 U	0.0212 U
PCBs 153 + 168	µg/kg	14.9	15.6	47.8	21.8 T	7.7	0.0212 U
PCB 155	µg/kg	0.0715	0.149	0.237	0.6 JT	0.0598 U	0.0339 U
PCBs 156 + 157	µg/kg	1.25	0.636	2.67	0.837 T	0.533	0.0374 U
PCB 158	µg/kg	1.38	0.771	2.57	1.01 T	0.394	0.019 U
PCB 159	µg/kg	0.133 J	0.134 J	0.709	0.32 JT	0.0766 J	0.0273 U
PCB 160	µg/kg	0.0286 U	0.0227 U	0.057 U	0.0203 UT	0.0191 U	0.0119 U
PCB 161	µg/kg	0.0488 U	0.0389 U	0.0975 U	0.0348 UT	0.0327 U	0.0204 U
PCB 162	µg/kg	0.0462 U	0.0849 U	0.292 U	0.0655 UT	0.0275 U	0.0247 U
PCB 164	µg/kg	0.906	0.77 J	2.89	1.14 T	0.476	0.0211 U
PCB 165	µg/kg	0.0504 U	0.0401 U	0.101 U	0.4 JT	0.0486 J	0.021 U
PCB 166	µg/kg	0.0509 U	0.0405 U	0.102 U	0.0363 UT	0.0341 U	0.0213 U
PCB 167	µg/kg	0.419 J	0.245	0.796	0.35 T	0.179	0.0198 U
PCB 169	µg/kg	0.0402 U	0.0736 U	0.271 U	0.303 JT	0.0251 U	0.023 U
PCB 170	µg/kg	6.98	6.69	26.5	12 T	2.32	0.057 U
PCBs 171 + 173	µg/kg	2.06	2.03	7.76	3.9 T	0.801	0.0551 U
PCB 172	µg/kg	1.29 J	1.3	4.69	2.39 T	0.472	0.0571 U
PCB 174	µg/kg	5.63	6.48	27.6	12.2 T	2.6	0.05 U
PCB 175	µg/kg	0.0261 U	0.208	0.689 J	0.346 JT	0.0602 J	0.0303 U
PCB 176	µg/kg	0.669	0.803	3.04	1.48 T	0.353	0.0231 U
PCB 177	µg/kg	3.95	4.76	18.6	8.5 T	2.41	0.0545 U
PCB 178	µg/kg	1.32	1.98	5.77	3.89 T	0.795	0.0303 U
PCB 179	µg/kg	2.72	3.38	10.7	7.49 T	1.39	0.0225 U
PCBs 180 + 193	µg/kg	14.3	14.6	57.9	27.4 T	4.84	0.0382 U
PCB 181	µg/kg	0.0407 U	0.0734 U	0.0797 U	0.163 JT	0.0834 U	0.0454 U
PCB 182	µg/kg	0.026 U	0.0301 U	0.0541 U	0.0312 UT	0.0484 U	0.0301 U
PCB 183	µg/kg	4.32	4.38	17.3	9.3 T	1.57	0.0494 U
PCB 184	µg/kg	0.017 U	0.0197 U	0.0353 U	0.0377 JT	0.0316 U	0.0197 U
PCB 185	µg/kg	0.89 J	0.84	3.66	1.59 T	0.279 J	0.0458 U
PCB 186	µg/kg	0.0188 U	0.0218 U	0.0391 U	0.0225 UT	0.035 U	0.0218 U
PCB 187	µg/kg	7.4	8.74	30	16.1 T	3.62	0.027 U
PCB 188	µg/kg	0.163	0.25 J	0.505	1.11 T	0.0481 U	0.0306 U
PCB 189	µg/kg	0.2	0.198	0.598 J	0.315 T	0.0514 U	0.0273 U
PCB 190	µg/kg	1.52	1.58	5.83	2.72 T	0.509	0.0388 U
PCB 191	µg/kg	0.315	0.299	0.937	0.52 T	0.0974 J	0.0415 U
PCB 192	µg/kg	0.0358 U	0.0645 U	0.0701 U	0.0438 UT	0.0733 U	0.0399 U
PCB 194	µg/kg	4.11	3.71	13.1	7.9 T	1.14	0.042 U
PCB 195	µg/kg	1.74	1.59	5.51	3.2 T	0.443	0.0442 U
PCB 196	µg/kg	2.25	2.21	7.47	4.53 T	0.621	0.0419 U
PCB 197	µg/kg	0.164 J	0.157	0.581	0.389 T	0.0539 J	0.0271 U
PCBs 198 + 199	µg/kg	3.48	3.48	12.8	7.61 T	1.23	0.0398 U
PCB 200	µg/kg	0.394	0.455	1.51	0.97 T	0.17 J	0.0301 U
PCB 201	µg/kg	0.49	0.47	1.76	1.14 T	0.163	0.0294 U
PCB 202	µg/kg	0.648	0.688	2.28	1.9 T	0.274	0.0314 U
PCB 203	µg/kg	2.07	1.92	7.29	4.49 T	0.669	0.0344 U
PCB 204	µg/kg	0.0197 U	0.0258 U	0.0435 U	0.0273 UT	0.0349 U	0.0296 U
PCB 205	µg/kg	0.201	0.198	0.636	0.399 T	0.0532	0.0303 U
PCB 206	µg/kg	0.794	0.976	3.59	2.31 T	0.428 J	0.0457 U
PCB 207	µg/kg	0.109 J	0.13	0.482	0.312 JT	0.0511 U	0.0438 U
PCB 208	µg/kg	0.126	0.141 J	0.567	0.4 T	0.123	0.0499 U
PCB 209	µg/kg	0.0199 U	0.14	0.461	0.138 JT	0.182	0.0318 U
RI Calc Total PCB Congeners	µg/kg	311 JT	479 JT	796 JT	1180 JT	157 JT	0.339 JT
FS Calc Total PCB Congeners	µg/kg	312 JT	481 JT	798 JT	1180 JT	159 JT	3.53 JT
PCB Congeners Homologs							
MonoCBTOT	µg/kg	0.0126 U	0.183	0.363	0.216 T	0.0932	0.0206 U
DiCBTOT	µg/kg	0.0654 U	4.78	2.79	33 T	0.522	0.242
TriCBTOT	µg/kg	5.44	34.3	25.6	200 T	9.29	0.0659
TetraCBTOT	µg/kg	65.6	199	153	532 T	39.4	0.131 U
PentaCBTOT	µg/kg	83.5	81.1	114	131 T	39.8	0.0156 U
HexaCBTOT	µg/kg	86.2	85.1	219	129 T	40.1	0.0119 U
HeptaCBTOT	µg/kg	53.8	58.5	222	111 T	22.1	0.0197 U
OctaCBTOT	µg/kg	15.5	14.9	52.9	32.6 T	4.82	0.0271 U
NonaCBTOT	µg/kg	1.03	1.25	4.64	3.02 T	0.551	0.0438 U

Table 5-1
Bulk Sediment Results

Notes:

All sample results are reported on a dry-weight basis by ALS Environmental Laboratory.

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

FS Calc = This result was calculated using the Feasibility Study (FS) data rules for the Portland Harbor, which are consistent with the risk assessment and background data set data rules, as described in Section 7.3 of the Final Supplemental RI/FS Work Plan (GSI and DOF, 2013).

Definition of data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

T = The associated numerical value was mathematically derived (e.g., from summing multiple analyte results such as Aroclors, or calculating the average of multiple results for a single analyte).

Table 5-2
Comparison of Re-Occupied Sediment Sample Locations

Analyte	Sample ID / Unit / Sample Date	Re-occupied Stations			Re-occupied Stations		Re-occupied Stations		Re-occupied Stations		Re-occupied Stations		Re-occupied Stations	
	Sample ID	LW3-UG02	RM11E-G079	RM11E-PW001-SED	RM11E-G022	RM11E-PW002-SED	RM11E-G026	RM11E-PW003-SED	RM11E-G027	RM11E-PW004-SED	RM11E-G028	RM11E-PW005-SED	RM11E-G033	RM11E-PW006-SED
	Unit													
	Sample Date	1/31/2007	10/31/2013	10/20/2014	5/7/2009	10/20/2014	5/8/2009	10/20/2014	5/8/2009	10/20/2014	5/8/2009	10/20/2014	5/13/2009	10/20/2014
Conventionals														
Total solids	percent	79.5	73.4 T	76.5	60.8	60.6	56.5	60.7	67	74.4 T	65.3 T	70.5	67.1	66.5
Total organic carbon	percent	0.36	0.484 T	0.385	2.03	2.51	1.35	2.63	0.4	1.16 T	1.4 T	0.954	0.46	0.924
Black carbon	percent	--	--	0.18 U	--	0.17 J	--	4.66	--	0.16 UT	--	0.18 U	--	0.18 U
Grain Size														
Clay	percent	--	1.8 T	0.97	7.8	7.84	7.55	14.91	--	1.55 T	4.81 T	5.3	1.02	12.16
Silt	percent	--	5.16 T	3.29	29.7	18.09	26.2	37.26	--	4.01 T	13 T	10.2	7.56	44.43
Very fine sand	percent	1.22	1.32 T	5.2	8.5	22.56	4.64	9.54	--	8.73 T	2.7 T	5.55	3.75	30.55
Fine sand	percent	4.58	9.63 T	19.94	33.4	24.99	17.4	5.7	--	31.05 T	16.4 T	13.81	36.1	12.88
Medium sand	percent	14	15.03 T	39.47	8.96	10.84	8.4	3.26	--	27.22 T	9.2 T	10.61	36.4	0.26
Coarse sand	percent	11	13.65 T	16.1	3.28	2.19	5.28	1.55	--	7.75 T	10 T	8.6	13.4	0.06
Very coarse sand	percent	6.8	5.1 T	5.16	3.1	1.46	5.76	1.69	--	3.29 T	6.1 T	3.84	3.15	0
Gravel	percent	50.6	49.58 T	8.03	1.89	7.46	19.9	34.41	--	18.31 T	35.4 T	49.83	0.94	0
Aroclors														
Aroclor 1016	µg/kg	22 U	2.1 UT	7.4 UJ	1 U	22 U	10 U	25 U	1 U	38 UT	1 U	17 U	5 U	2.1 U
Aroclor 1221	µg/kg	22 U	2.1 UT	2.1 U	1 U	7.2 U	10 U	12 U	1 U	15 UT	1 U	6.5 U	5 U	2.1 U
Aroclor 1232	µg/kg	22 U	2.1 UT	9.8 U	1 U	130 U	10 U	87 U	1 U	55 UT	1 U	20 U	5 U	2.1 U
Aroclor 1242	µg/kg	22 U	2.1 UT	5.4 U	1 U	60 U	10 U	62 U	23 J	97 UT	43 J	23 U	5 U	2.1 U
Aroclor 1248	µg/kg	22 U	2.1 UT	6.9 U	1 U	62 U	10 U	37 U	1 U	280 UT	1 U	14 U	5 U	2.1 U
Aroclor 1254	µg/kg	1300 J	2.1 UT	6.6 U	68 J	27 U	10 U	48 U	48 J	44 UT	140 J	28 U	5 U	2.1 U
Aroclor 1260	µg/kg	4600 J	1405 JT	82 J	110 J	170	1400 J	120	62 J	1260 T	190 J	55	2000 J	2.1 U
Aroclor 1262	µg/kg	22 U	2.1 UT	--	1 U	--	10 U	--	1 U	--	1 U	--	5 U	--
Aroclor 1268	µg/kg	22 U	2.1 UT	--	1 U	--	10 U	--	1 U	--	1 U	--	5 U	--
RI Calc Total PCB Aroclors	µg/kg	5900 JT	1405 JT	82 JT	178 JT	170 T	1400 JT	120 T	133 JT	1260 T	373 JT	55 T	2000 JT	2.1 UT
FS Calc Total PCB Aroclors	µg/kg	6000 JT	1400 JT	101 JT	182 JT	324 T	1440 JT	256 T	136 JT	1520 T	376 JT	109 T	2020 JT	2.1 UT
PCB Congeners														
RI Calc Total PCB Congeners	µg/kg	--	--	311 JT	--	479 JT	--	796 JT	--	1180 JT	--	157 JT	--	0.339 JT
FS Calc Total PCB Congeners	µg/kg	--	--	312 JT	--	481 JT	--	798 JT	--	1180 JT	--	159 JT	--	3.53 JT

Notes:

The data for re-occupied stations are shown side by side, with the original result in the left column(s) and newer reoccupied result in the right column. For reference, the data retained for mapping in the upper panel of Figure 5-2 is highlighted in pink.

All sample results are reported on a dry-weight basis by ALS Environmental Laboratory.

-- = Not Analyzed

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

FS Calc = This result was calculated using the Feasibility Study (FS) data rules for the Portland Harbor, which are consistent with the risk assessment and background data set data rules, as described in Section 7.3 of the Final Supplemental RI/FS Work Plan (GSI and DOF, 2013).

Definition of data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

T = The associated numerical value was mathematically derived (e.g., from summing multiple analyte results such as Aroclors, or calculating the average of multiple results for a single analyte).

Table 5-3
Comparison of MIT and ALS Sediment Data

ALS				MIT[1]		
Analyte	Sample ID / Unit	RM11E-PW001	RM11E-PW004	Analyte	RM11E-PW001	RM11E-PW004
Conventionals						
Solids, Total	percent	76.5	74.4 T	Solids, Total	--	--
Total organic carbon	percent	0.385	1.16 T	Total organic carbon	0.40	0.64
Black Carbon	percent	0.18 U	0.16 UT	Black Carbon	0.03	0.25
PCB Congeners						
PCB 1	µg/kg	0.0126 U	0.178 T	PCB 1	ND	ND
PCB 2	µg/kg	0.0133 U	0.0143 UT	PCB 2	ND	ND
PCB 3	µg/kg	0.0143 U	0.0378 JT	PCB 3	ND	ND
PCB 4	µg/kg	0.259 U	30.5 T	PCBs 4 + 10	0.70	14.32
PCB 5	µg/kg	0.0709 U	0.0679 UT	PCBs 5 + 8	ND	1.77
PCB 6	µg/kg	0.0704 U	0.313 T	PCB 6	ND	ND
PCB 7	µg/kg	0.0654 U	0.164 T	PCBs 7 + 9	ND	1.57
PCB 8	µg/kg	0.0667 U	0.731 T	--	--	--
PCB 9	µg/kg	0.0717 U	0.0687 UT	--	--	--
PCB 10	µg/kg	0.166 U	0.451 T	--	--	--
PCB 11	µg/kg	0.0746 U	1.14 T	PCB 11	ND	ND
PCBs 12 + 13	µg/kg	0.0716 U	0.0687 UT	PCB 12	ND	ND
--	µg/kg	--	--	PCB 13	ND	ND
PCB 14	µg/kg	0.0723 U	0.0694 UT	PCB 14	1.10	ND
PCB 15	µg/kg	0.0787 U	0.221 T	PCB 15	ND	ND
PCB 16	µg/kg	0.0487 U	0.257 JT	PCBs 16 + 32	0.71	11.67
PCB 17	µg/kg	0.632	43.8 T	PCB 17	0.64	31.11
PCB 18	µg/kg	0.0303 U	0.0239 UT	PCB 18	ND	3.05
PCB 19	µg/kg	2.79	106 JT	PCB 19	1.66	48.82
PCBs 20 + 28	µg/kg	0.549	12.3 T	PCBs 20+21+33	0.98	3.64
PCBs 21 + 33	µg/kg	0.235	3.82 JT	--	--	--
PCB 22	µg/kg	0.0212 U	0.138 T	PCB 22	ND	ND
PCB 23	µg/kg	0.0202 U	0.0437 UT	PCBs 23 + 34	ND	ND
PCB 24	µg/kg	0.0284 U	0.0224 UT	PCBs 24+27	0.41	6.93
PCB 25	µg/kg	0.128	1.35 T	PCBs 25+26	ND	2.98
PCBs 26 + 29	µg/kg	0.0835	2.14 T	--	--	--
PCB 27	µg/kg	0.291	9.57 T	--	--	--
--	µg/kg	--	--	PCBs 28+31	0.38	7.39
--	µg/kg	--	--	PCB 29	ND	ND
PCB 30	µg/kg	0.162	4.36 T	PCB 30	ND	ND
PCB 31	µg/kg	0.103	2.63 T	--	--	--
PCB 32	µg/kg	0.462	13.1 T	--	--	--
PCB 34	µg/kg	0.0233 U	0.0503 UT	--	--	--
PCB 35	µg/kg	0.0228 U	0.0493 UT	PCB 35	ND	ND
PCB 36	µg/kg	0.0211 U	1.15 T	PCB 36	1.84	2.38
PCB 37	µg/kg	0.0268 U	0.117 T	PCB 37	ND	ND
PCB 38	µg/kg	0.0234 U	0.0506 UT	PCB 38	ND	6.26
PCB 39	µg/kg	0.0199 U	0.043 UT	PCB 39	Injection standard	
PCBs 40 + 71	µg/kg	1.57	12.5 T	PCB 40	ND	ND
PCB 41	µg/kg	0.591	0.0319 UT	PCBs 41+64+68	ND	2.74
PCB 42	µg/kg	0.289 J	1.7 T	PCB 42	ND	ND
PCBs 43 + 73	µg/kg	0.0348 U	0.0222 UT	PCB 43	ND	ND
PCBs 44 + 47 + 65	µg/kg	21.6	145 T	PCB 44	ND	1.60
PCBs 45 + 51	µg/kg	10.4	106 T	PCB 45	ND	ND
PCB 46	µg/kg	0.211 J	3.46 T	PCB 46	ND	2.35
--	µg/kg	--	--	PCBs 47+48+75	3.69	143.32
PCB 48	µg/kg	0.0385 U	0.0246 UT	--	--	--
PCB 49	µg/kg	10.2	69.7 T	PCB 49	2.33	37.57
PCBs 50 + 53	µg/kg	7.22	77.7 T	PCB 50	ND	6.38
--	µg/kg	--	--	PCB 51	1.81	64.04
PCB 52	µg/kg	8.25	79 T	PCB 52	2.89	28.81
--	µg/kg	--	--	PCB 53	2.03	36.06
PCB 54	µg/kg	1.64	26.1 T	PCB 54	0.49	17.75
PCB 55	µg/kg	0.0443 U	0.0283 UT	PCB 55	Injection standard	
PCB 56	µg/kg	0.126 J	0.221 T	PCBs 56+60	ND	ND
PCB 57	µg/kg	0.0328 U	0.0209 UT	PCB 57	ND	ND
PCB 58	µg/kg	0.0314 U	0.02 UT	PCB 58	ND	ND
PCBs 59 + 62 + 75	µg/kg	0.389 J	3.58 T	PCB 59	ND	ND
PCB 60	µg/kg	0.0411 J	0.0422 UT	--	--	--
PCB 61	µg/kg	0.0339 U	0.0217 UT	PCB 61	ND	ND
--	µg/kg	--	--	PCB 62	ND	ND
PCB 63	µg/kg	0.0324 U	0.22 T	PCB 63	1.21	1.64
PCB 64	µg/kg	0.202	0.827 T	--	--	--
--	µg/kg	--	--	PCB 65	ND	ND
PCB 66	µg/kg	1.33	3.1 T	PCBs 66+80	0.58	2.23
PCB 67	µg/kg	0.0286 U	0.0183 UT	PCB 67	ND	ND
PCB 68	µg/kg	0.11	0.69 JT	--	--	--

Table 5-3
Comparison of MIT and ALS Sediment Data

ALS				MIT[1]		
Analyte	Sample ID / Unit	RM11E-PW001	RM11E-PW004	Analyte	RM11E-PW001	RM11E-PW004
PCB 69	µg/kg	0.0241 U	0.0154 UT	PCB 69	ND	3.39
PCBs 70 + 74 + 76	µg/kg	1.24	2.54 T	PCB 70	0.46	2.22
--	µg/kg	--	--	PCBs 71+72	0.50	6.60
PCB 72	µg/kg	0.0299 U	0.198 JT	--	--	--
--	µg/kg	--	--	PCB 73	0.41	3.59
--	µg/kg	--	--	PCB 74	ND	ND
--	µg/kg	--	--	PCB 76	ND	ND
PCB 77	µg/kg	0.0832 J	0.08 JT	PCB 77	ND	ND
PCB 78	µg/kg	0.0237 U	0.0452 UT	PCB 78	ND	ND
PCB 79	µg/kg	0.0453	0.04 UT	PCB 79	0.59	ND
PCB 80	µg/kg	0.0195 U	0.0372 UT	--	--	--
PCB 81	µg/kg	0.0215 U	0.0846 JT	PCBs 81+148	2.31	2.72
PCB 82	µg/kg	0.723 J	0.116 UT	PCB 82	0.59	1.95
PCBs 83 + 99	µg/kg	6.71	10.91 T	PCBs 83+109	ND	ND
PCB 84	µg/kg	1.79	1.52 JT	PCB 84	0.54	2.69
PCB 85	µg/kg	3.66 J	1.65 JT	PCBs 85+120	ND	ND
PCBs 86 + 87 + 97 + 109 + 119 + 125	µg/kg	7.04	8.03 T	PCBs 87+115	0.85	3.00
PCB 88	µg/kg	0.0266 U	0.0276 UT	PCB 88	ND	ND
PCB 89	µg/kg	0.114 U	0.0982 UT	PCBs 89+90+101	6.77	32.70
PCBs 90 + 101 + 113	µg/kg	14	18.5 T	--	--	--
PCB 91	µg/kg	8.52	22.1 T	PCB 91	2.07	21.96
PCB 92	µg/kg	2.69	4.69 T	PCB 92	0.93	5.12
PCB 93	µg/kg	0.0268 U	0.0278 UT	PCB 93	ND	ND
PCB 94	µg/kg	0.699 J	2.67 T	PCB 94	ND	3.93
PCBs 95 + 100	µg/kg	13.7	33 T	PCBs 95+121	4.36	21.20
PCB 96	µg/kg	1.39 J	4.98 T	PCB 96	0.34	5.07
--	µg/kg	--	--	PCBs 97+86+125	0.47	2.90
PCBs 98 + 102	µg/kg	0.624 J	1.97 T	PCBs 98+102	ND	4.79
--	µg/kg	--	--	PCB 99	1.43	8.82
--	µg/kg	--	--	PCB 100	1.64	27.34
PCB 103	µg/kg	1.57	5.71 T	PCB 103	0.56	6.30
PCB 104	µg/kg	0.471	3.14 T	PCB 104	Injection standard	
PCB 105	µg/kg	2.52	0.51 JT	PCB 105	0.62	ND
PCB 106	µg/kg	0.0378 U	0.0212 UT	PCBs 106+118	1.74	5.04
PCB 107	µg/kg	0.565	0.738 T	PCBs 107+108+123	0.96	3.26
PCBs 108 + 124	µg/kg	0.351	0.0593 JT	--	--	--
PCBs 110 + 115	µg/kg	8.41	5.47 T	PCB 110	3.06	11.13
PCB 111	µg/kg	0.0726 U	0.139 T	PCBs 111+116+117	ND	2.07
PCB 112	µg/kg	0.0767 U	0.0665 UT	PCB 112	ND	ND
--	µg/kg	--	--	PCB 113	ND	ND
PCB 114	µg/kg	0.143	0.109 T	PCB 114	ND	ND
PCBs 117 + 116	µg/kg	0.978	2.25 T	--	--	--
PCB 118	µg/kg	6.46	2.13 T	--	--	--
--	µg/kg	--	--	PCB 119	2.22	6.22
PCB 120	µg/kg	0.0725 U	0.369 T	--	--	--
PCB 121	µg/kg	0.116 J	0.792 T	--	--	--
PCB 122	µg/kg	0.0909	0.0549 JT	PCB 122	ND	ND
PCB 123	µg/kg	0.0876	0.0211 UT	--	--	--
--	µg/kg	--	--	PCB 124	ND	ND
PCB 126	µg/kg	0.173 J	0.523 JT	PCB 126	ND	ND
PCB 127	µg/kg	0.0382 U	0.0229 JT	PCB 127	ND	ND
PCB 128	µg/kg	1.83	0.698 T	PCB 128	1.11	3.93
PCBs 129 + 138 + 163	µg/kg	21.1	22 T	PCB 129	ND	ND
PCB 130	µg/kg	0.855	0.476 T	PCB 130	0.59	ND
PCB 131	µg/kg	0.126	0.0422 UT	PCB 131	ND	ND
PCB 132	µg/kg	5.02	4.05 T	--	--	--
PCB 133	µg/kg	0.436	1.9 T	PCBs 133+165	ND	ND
PCB 134	µg/kg	0.633	0.843 T	PCBs 134+143	0.56	2.94
PCBs 135 + 154	µg/kg	1.6	5.1 JT	PCB 135	2.58	8.53
PCB 136	µg/kg	3.54	6.41 T	PCB 136	3.00	13.42
PCB 137	µg/kg	0.659	0.415 JT	PCB 137	ND	ND
--	µg/kg	--	--	PCBs 138+160	10.31	28.18
PCBs 139 + 140	µg/kg	0.281	0.56 T	PCBs 139+149	15.65	53.02
--	µg/kg	--	--	PCB 140	ND	ND
PCB 141	µg/kg	2.78	2.99 T	PCB 141	4.70	12.84
PCB 142	µg/kg	0.0707 U	0.0503 UT	PCB 142	0.49	2.63
PCB 143	µg/kg	0.0676 U	0.0481 UT	--	--	--
PCB 144	µg/kg	0.372 J	0.5 JT	PCB 144	1.06	3.25
PCB 145	µg/kg	0.0199 U	0.017 UT	PCB 145	ND	ND
PCB 146	µg/kg	2.91	5.63 T	--	--	--
PCBs 147 + 149	µg/kg	17.7	37.5 T	PCB 147	1.84	16.70

Table 5-3
Comparison of MIT and ALS Sediment Data

ALS				MIT[1]		
Analyte	Sample ID / Unit	RM11E-PW001	RM11E-PW004	Analyte	RM11E-PW001	RM11E-PW004
PCB 148	µg/kg	0.207	0.719 JT	--	--	--
PCB 150	µg/kg	0.394	1.2 JT	PCB 150	Injection standard	
PCB 151	µg/kg	6.12	9.45 T	PCB 151	5.72	21.80
PCB 152	µg/kg	0.563	1.72 T	PCB 152	ND	1.60
PCBs 153 + 168	µg/kg	14.9	21.8 T	PCBs 153+132	19.09	58.19
--	µg/kg	--	--	PCB 154	0.44	4.81
PCB 155	µg/kg	0.0715	0.6 JT	PCB 155	ND	ND
PCBs 156 + 157	µg/kg	1.25	0.837 T	PCB 156	0.99	3.07
--	µg/kg	--	--	PCB 157	ND	ND
PCB 158	µg/kg	1.38	1.01 T	PCB 158	1.34	4.35
PCB 159	µg/kg	0.133 J	0.32 JT	PCB 159	ND	ND
PCB 160	µg/kg	0.0286 U	0.0203 UT	--	--	--
PCB 161	µg/kg	0.0488 U	0.0348 UT	PCBs 161	ND	ND
PCB 162	µg/kg	0.0462 U	0.0655 UT	PCB 162	ND	ND
--	µg/kg	--	--	PCBs 163+164	7.35	24.21
PCB 164	µg/kg	0.906	1.14 T	--	--	--
PCB 165	µg/kg	0.0504 U	0.4 JT	--	--	--
PCB 166	µg/kg	0.0509 U	0.0363 UT	PCB 166	ND	ND
PCB 167	µg/kg	0.419 J	0.35 T	PCB 167	0.51	1.70
--	µg/kg	--	--	PCB 168	4.05	11.72
PCB 169	µg/kg	0.0402 U	0.303 JT	PCB 169	ND	ND
PCB 170	µg/kg	6.98	12 T	PCBs 170+190	5.76	16.84
PCBs 171 + 173	µg/kg	2.06	3.9 T	PCB 171	2.87	7.16
PCB 172	µg/kg	1.29 J	2.39 T	PCBs 172+192	1.82	4.99
--	µg/kg	--	--	PCB 173	ND	ND
PCB 174	µg/kg	5.63	12.2 T	PCBs 174+181	11.38	28.34
PCB 175	µg/kg	0.0261 U	0.346 JT	PCB 175	ND	4.14
PCB 176	µg/kg	0.669	1.48 T	PCB 176	1.51	4.01
PCB 177	µg/kg	3.95	8.5 T	PCB 177	6.42	18.30
PCB 178	µg/kg	1.32	3.89 T	PCB 178	2.30	7.06
PCB 179	µg/kg	2.72	7.49 T	PCB 179	4.74	14.26
PCBs 180 + 193	µg/kg	14.3	27.4 T	PCBs 180+193	27.70	75.32
PCB 181	µg/kg	0.0407 U	0.163 JT	--	--	--
PCB 182	µg/kg	0.026 U	0.0312 UT	PCBs 182+187	14.30	39.15
PCB 183	µg/kg	4.32	9.3 T	PCB 183	6.40	16.77
PCB 184	µg/kg	0.017 U	0.0377 JT	PCB 184	0.75	ND
PCB 185	µg/kg	0.89 J	1.59 T	PCB 185	1.33	ND
PCB 186	µg/kg	0.0188 U	0.0225 UT	PCB 186	ND	ND
PCB 187	µg/kg	7.4	16.1 T	--	--	--
PCB 188	µg/kg	0.163	1.11 T	PCB188	Injection standard	
PCB 189	µg/kg	0.2	0.315 T	PCB 189	0.60	ND
PCB 190	µg/kg	1.52	2.72 T	--	--	--
PCB 191	µg/kg	0.315	0.52 T	PCB 191	0.54	ND
PCB 192	µg/kg	0.0358 U	0.0438 UT	--	--	--
PCB 194	µg/kg	4.11	7.9 T	PCB 194	7.43	19.44
PCB 195	µg/kg	1.74	3.2 T	PCB 195	3.63	10.80
PCB 196	µg/kg	2.25	4.53 T	PCBs 196+203	7.92	21.76
PCB 197	µg/kg	0.164 J	0.389 T	--	--	--
PCBs 198 + 199	µg/kg	3.48	7.61 T	PCB 198	ND	ND
--	µg/kg	--	--	PCB 199	6.74	16.02
PCB 200	µg/kg	0.394	0.97 T	PCB 200	1.01	ND
PCB 201	µg/kg	0.49	1.14 T	PCB 201	ND	4.14
PCB 202	µg/kg	0.648	1.9 T	PCB 202	ND	ND
PCB 203	µg/kg	2.07	4.49 T	--	--	--
PCB 204	µg/kg	0.0197 U	0.0273 UT	PCB 204	ND	ND
PCB 205	µg/kg	0.201	0.399 T	PCB 205	ND	ND
PCB 206	µg/kg	0.794	2.31 T	PCB 206	2.38	5.67
PCB 207	µg/kg	0.109 J	0.312 JT	PCB 207	ND	ND
PCB 208	µg/kg	0.126	0.4 T	PCB 208	ND	ND
PCB 209	µg/kg	0.0199 U	0.138 JT	PCB 209	ND	ND
Total PCBs						
RI Calc Total PCB	µg/kg	311 JT	1180 JT	RI Calc Total PCB	256	1271
PCB Congeners Homologs						
MonoCBTOT	µg/kg	0.0126 U	0.216 T	MonoCBTOT	--	--
DiCBTOT	µg/kg	0.0654 U	33 T	DiCBTOT	1.81	17.66
TriCBTOT	µg/kg	5.44	200 T	TriCBTOT	6.61	124.23
TetraCBTOT	µg/kg	65.6	532 T	TetraCBTOT	16.98	360.28
PentaCBTOT	µg/kg	83.5	131 T	PentaCBTOT	29.17	175.51
HexaCBTOT	µg/kg	86.2	129 T	HexaCBTOT	86.66	288.58

Table 5-3
Comparison of MIT and ALS Sediment Data

ALS				MIT[1]		
Analyte	Sample ID / Unit	RM11E-PW001	RM11E-PW004	Analyte	RM11E-PW001	RM11E-PW004
HeptaCBTOT	µg/kg	53.8	111 T	HeptaCBTOT	88.43	236.33
OctaCBTOT	µg/kg	15.5	32.6 T	OctaCBTOT	26.74	72.16
NonaCBTOT	µg/kg	1.03	3.02 T	NonaCBTOT	2.38	5.67

Notes:

All sample results are reported on a dry-weight basis

ALS = ALS Environmental Laboratory

-- = Not Analyzed

ND = Not Detected above MITs method detection limits (MDLs).

[1]Data reported by the Massachusetts Institute of Technology (MIT) laboratory is included in this report as a comparative measure to those reported by ALS. As MIT's methods are not in strict adherence with EPA SW-846 and have not undergone third party data validation, those data do not conform to the CERCLA requirements and thus will not be uploaded into the project database or files. Only detected analytes are shown in the tables. Additional information provided by MIT is included in Appendix J of this report.

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

Definition of data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

T = The associated numerical value was mathematically derived (e.g., from summing multiple analyte results such as Aroclors, or calculating the average of multiple results for a single analyte).

Table 6-1
ALS PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Analyte	Station ID	RM11E-PW001		RM11E-PW002		RM11E-PW003		RM11E-PW004		RM11E-PW005		RM11E-PW006		RM11E-PW007
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Surface Water
	Sample ID / Units	RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP002A	RM11E-PWW002A	RM11E-PWP003A	RM11E-PWW003A	RM11E-PWP004B	RM11E-PWW004B	RM11E-PWP005A	RM11E-PWW005A	RM11E-PWP006A	RM11E-PWW006A	RM11E-PWW007
PCB Congeners														
PCB 1	µg/kg	3.45 U	6.74 U	0.425 J	0.331 U	3.42 U	4.46 U	3.06	0.265 U	0.376 J	0.206 U	3.14 U	8.72 U	0.133 U
PCB 2	µg/kg	5.23 U	10.1 U	0.162 U	0.414 U	5.04 U	6.62 U	0.205 U	0.339 U	0.169 U	0.255 U	4.37 U	13.3 U	0.0123 U
PCB 3	µg/kg	5.46 U	10.4 U	0.166 U	0.428 U	5.16 U	6.8 U	0.209 U	0.357 U	0.17 U	0.259 U	4.3 U	13.9 U	0.0222 U
PCB 4	µg/kg	66.8	4.04 U	54	1.48 J	38.3	2.25 U	314	2.11	6.22	0.492 J	214	5.64 U	4.07 U
PCB 5	µg/kg	2.35 U	4.87 U	0.0727 U	0.162 U	1.82 U	2.56 U	0.102 U	0.142 U	0.0802 U	0.121 U	0.901 U	5.64 U	0.0092 U
PCB 6	µg/kg	2.39 U	4.94 U	0.742 J	0.151 U	1.85 U	2.6 U	2.72	0.132 U	1.29	0.113 U	0.915 U	5.72 U	0.0534 U
PCB 7	µg/kg	2.11 U	4.36 U	0.375 J	0.137 U	1.64 U	2.3 U	0.907 J	0.12 U	0.222 J	0.103 U	0.808 U	5.06 U	0.0088 U
PCB 8	µg/kg	6.4 J	4.34 U	2.55 J	0.138 U	9.61 J	2.29 U	9.77	0.121 U	2.53	0.104 U	16.9 J	5.03 U	0.115 U
PCB 9	µg/kg	2.64 U	5.46 U	0.319 J	0.162 U	2.05 U	2.88 U	1.15 J	0.141 U	0.297 J	0.121 U	1.02 U	6.32 U	0.02 J
PCB 10	µg/kg	1.43 U	3.27 U	3.07 J	0.147 U	1.59 U	1.86 U	17.6	0.0974 U	0.479 J	0.105 U	15.7 J	4.65 U	0.286 U
PCB 11	µg/kg	2.67 U	5.52 U	1.55 J	0.914 J	5.76 J	2.91 U	2.49 J	0.696 J	0.756 J	0.721 J	6.54 J	6.4 U	0.619 J
PCBs 12 + 13	µg/kg	2.44 U	5.04 U	0.365 J	0.15 U	1.89 U	2.66 U	0.712 J	0.131 U	0.243 J	0.112 U	0.934 U	5.84 U	0.0504 U
PCB 14	µg/kg	2.4 U	4.96 U	0.0697 U	0.155 U	1.86 U	2.62 U	0.0976 U	0.136 U	0.0769 U	0.116 U	0.919 U	5.75 U	0.0092 U
PCB 15	µg/kg	63.5	6.59 U	2.73	0.184 U	32.9	3.5 U	6.02	0.392 J	2.58	0.138 U	66.3	7.71 U	0.193 U
PCB 16	µg/kg	14.1 U	28.2 U	0.704 J	0.731 U	10 J	16.7 U	1.74 J	0.661 U	1.42	0.561 U	8.53 U	32.3 U	0.0337 J
PCB 17	µg/kg	66.2	24.7 U	36.6	2.25 J	43.3	14.6 U	145	4.57	10.1	0.912 J	220	28.2 U	0.79 U
PCB 18	µg/kg	29.3	16.8 U	1.22 J	0.456 U	15.6 J	9.89 U	1.95 J	0.412 U	0.973 J	0.35 U	28.1 J	19.2 U	0.074 U
PCB 19	µg/kg	153	18.2 U	106	5.37 J	97.4	11.2 U	601	8.52	34.1	1.75 J	778	47.4 J	4.37 U
PCBs 20 + 28[‡]	µg/kg	17800	374	491	26.8	11600	849	443	5.89	466	6.95	15800	1480	114 J
PCBs 21 + 33	µg/kg	84.6 U	12.1 U	1.23 U	0.607 U	46.9 U	9.29 U	9.07	0.509 U	2.94 J	0.365 U	60 U	21.9 U	0.0458 U
PCB 22	µg/kg	99.6 U	14.2 U	1.43 U	0.704 U	55.3 U	11 U	0.84 U	0.591 U	0.822 J	0.424 U	70.7 U	25.8 U	0.0506 U
PCB 23	µg/kg	91.9 U	13.1 U	1.32 U	0.648 U	51 U	10.1 U	0.773 U	0.544 U	0.516 U	0.39 U	65.2 U	23.8 U	0.0511 U
PCB 24	µg/kg	8.04 U	16.2 U	0.228 U	0.405 U	4.88 U	9.52 U	0.27 U	0.366 U	0.189 U	0.311 U	4.89 U	18.5 U	0.0143 U
PCB 25	µg/kg	76.2 U	10.9 U	2.14	0.514 U	42.3 U	8.37 U	3.45	0.432 U	2.04	0.309 U	54.1 U	19.8 U	0.206 J
PCBs 26 + 29	µg/kg	97.4 U	13.9 U	1.42 U	0.7 U	54 U	10.7 U	4.36	0.587 U	2.52	0.421 U	69.1 U	25.3 U	0.0513 U
PCB 27	µg/kg	17.8 J	17.6 U	10.8	0.767 J	10.1 J	10.4 U	48	1.39 J	3.96	0.383 U	73.6	20.1 U	0.597 U
PCB 30	µg/kg	19.5 J	23.9 U	8.43	0.827 J	21.4 J	14.1 U	23.4	0.94 J	5.75	0.477 U	32.4	27.3 U	0.313 U
PCB 31	µg/kg	95.6 U	13.7 U	5.43	0.791 J	53.1 U	10.6 U	9.89	0.532 U	4.58	0.382 U	67.9 U	24.8 U	0.34 J
PCB 32	µg/kg	8.15 U	16.4 U	37.1	1.4 J	4.94 U	9.65 U	65.9	2.15	11.9	0.727 J	4.96 U	18.8 U	0.31 U
PCB 34	µg/kg	114 U	16.2 U	1.55 U	0.764 U	63 U	12.5 U	0.911 U	0.641 U	0.608 U	0.46 U	80.6 U	29.4 U	0.0519 U
PCB 35	µg/kg	112 U	15.9 U	1.46 U	0.722 U	61.8 U	12.3 U	0.861 U	0.606 U	0.574 U	0.434 U	79.1 U	28.9 U	0.0522 U
PCB 36	µg/kg	92.1 U	13.2 U	1.32 U	0.65 U	51.1 U	10.2 U	0.775 U	0.545 U	0.517 U	0.391 U	65.4 U	23.9 U	0.0477 U
PCB 37	µg/kg	147 U	21.7 U	1.83 U	0.922 U	82.2 U	16.5 U	1.08 U	0.756 U	0.716 U	0.541 U	102 U	36.6 U	0.0619 U
PCB 38	µg/kg	104 U	14.8 U	1.5 U	0.741 U	57.3 U	11.4 U	0.884 U	0.622 U	0.59 U	0.446 U	73.4 U	26.8 U	0.0531 U
PCB 39	µg/kg	84.9 U	12.1 U	1.25 U	0.614 U	47.1 U	9.33 U	0.733 U	0.515 U	0.489 U	0.369 U	60.2 U	22 U	0.0447 U
PCBs 40 + 71	µg/kg	7.1 U	11.6 U	19.7	4.05 J	60.2 J	7.46 U	34.5	3.62 J	9.49	1.03 J	9.64 U	18.2 U	0.0239 U

Table 6-1
ALS PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Analyte	Station ID	RM11E-PW001		RM11E-PW002		RM11E-PW003		RM11E-PW004		RM11E-PW005		RM11E-PW006		RM11E-PW007
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Surface Water
	Sample ID / Units	RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP002A	RM11E-PWW002A	RM11E-PWP003A	RM11E-PWW003A	RM11E-PWP004B	RM11E-PWW004B	RM11E-PWP005A	RM11E-PWW005A	RM11E-PWP006A	RM11E-PWW006A	RM11E-PWW007
PCB 41	µg/kg	9.09 U	14.8 U	0.728 U	0.62 U	7.44 U	9.54 U	0.575 U	0.562 U	0.323 U	0.267 U	12.4 U	23.3 U	0.0315 U
PCB 42	µg/kg	14.1 J	9.72 U	3.11 J	0.663 J	4.88 U	6.26 U	5.63 J	1.01 J	1.94 J	0.375 J	8.1 U	15.3 U	0.0221 U
PCBs 43 + 73	µg/kg	6.59 U	10.8 U	0.514 U	0.438 U	5.39 U	6.92 U	0.406 U	0.397 U	0.228 U	0.189 U	8.94 U	16.9 U	0.0228 U
PCBs 44 + 47‡ + 65	µg/kg	14100	2120	677	145	11000	3130	718	88.4	482	43.9	13400	4720	261
PCBs 45 + 51	µg/kg	71.4 J	34.1 J	152	15.1	253	9.91 J	215	18.6	31.9	3.76 J	427	85.7 J	0.964 U
PCB 46	µg/kg	8.64 U	14.1 U	6.01	0.614 U	7.07 U	9.07 U	10.5	0.902 J	1.79	0.264 U	11.8 U	22.2 U	0.0322 U
PCB 48	µg/kg	6.63 U	10.9 U	0.543 U	0.463 U	5.43 U	6.97 U	2.54 J	0.419 U	0.241 U	0.199 U	9 U	17 U	0.0245 U
PCB 49	µg/kg	181	34.8 J	114	22.3	317	25.1 J	182	24.3	56	6.5 J	329	100 J	4.49 J
PCBs 50 + 53	µg/kg	122	25 J	129	12.2	211	7.69 U	244	16.3	41.7	3.61 J	343	48.9 J	1.39 U
PCB 52	µg/kg	89 J	12.3 U	90	21.3	275	7.9 U	224	25.8	83.3	7.13	146 J	56	2.74 U
PCB 54‡	µg/kg	11500	74.2 J	361	8.92	6810	39.7	387	6.35	364	5.57	12400	172	17.3
PCB 55	µg/kg	6.51 U	10.6 U	0.479 U	0.408 U	5.33 U	6.84 U	0.379 U	0.37 U	0.213 U	0.176 U	8.84 U	16.7 U	0.0192 U
PCB 56	µg/kg	30.3 J	14.5 U	1.82 J	0.795 J	33.6 J	7.02 U	1.97 J	0.375 J	2.1 J	0.392 J	25.9	23.2 U	0.685
PCB 57	µg/kg	6.11 U	9.96 U	0.477 U	0.406 U	5 U	6.42 U	0.376 U	0.368 U	0.212 U	0.175 U	8.3 U	15.7 U	0.0209 U
PCB 58	µg/kg	5.84 U	9.51 U	2.62 J	1.04 J	4.78 U	6.13 U	5.78	1.02 J	1.35 J	0.179 J	7.92 U	15 U	0.018 U
PCBs 59 + 62 + 75	µg/kg	7.78 U	24.4 J	7.53	2.21 J	112 J	8.18 U	9.99 J	2 J	1.5 J	0.395 J	10.6 U	26.1 J	0.0196 U
PCB 60	µg/kg	8.03 U	13 U	0.411 J	0.401 U	4.25 U	6.29 U	0.224 U	0.21 U	0.239 J	0.149 U	3.84 U	20.8 U	0.0886 J
PCB 61	µg/kg	5.86 U	9.54 U	0.446 U	0.38 U	4.79 U	6.15 U	0.353 U	0.345 U	0.198 U	0.164 U	7.95 U	15 U	0.0198 U
PCB 63	µg/kg	5.87 U	9.56 U	0.432 U	0.368 U	4.8 U	6.16 U	0.341 U	0.334 U	0.192 U	0.159 U	7.96 U	15.1 U	0.0197 U
PCB 64	µg/kg	3.76 U	6.12 U	2.22 J	0.733 J	3.08 U	3.95 U	3.49	0.645 J	1.62 J	0.418 J	5.1 U	9.62 U	0.0155 U
PCB 66	µg/kg	6.27 U	10.3 U	6.17	2.81 J	32.1	6.58 U	10.5	2.65 J	4.14	1.76 J	8.51 U	16.1 U	0.0195 U
PCB 67	µg/kg	5.19 U	8.45 U	0.413 U	0.352 U	4.25 U	5.45 U	0.326 U	0.319 U	0.183 U	0.152 U	7.04 U	13.3 U	0.0191 U
PCB 68	µg/kg	5.23 U	8.52 U	0.397 U	0.464 J	4.28 U	5.49 U	1.44 J	0.307 U	0.176 U	0.146 U	7.1 U	13.4 U	0.0177 U
PCB 69	µg/kg	4.42 U	7.2 U	0.357 U	0.304 U	3.62 U	4.64 U	2.8 J	0.276 U	0.159 U	0.131 U	6 U	11.4 U	0.0166 U
PCBs 70 + 74 + 76	µg/kg	5.09 U	8.29 U	7.52 J	3.73 J	43.8 J	5.35 U	13.8	4.01 J	6.53 J	2.53 J	6.91 U	13.1 U	1.1
PCB 72	µg/kg	5.59 U	9.11 U	0.43 U	0.367 U	4.58 U	5.88 U	0.34 U	0.332 U	0.191 U	0.158 U	7.59 U	14.4 U	0.0193 U
PCB 77	µg/kg	10.8 U	17.8 U	0.268 U	0.51 U	5.39 U	8.21 U	0.36 J	0.268 U	0.229 U	0.189 U	4.96 U	27.2 U	0.0242 U
PCB 78	µg/kg	9.39 U	15.2 U	0.231 U	0.434 U	4.98 U	7.36 U	0.242 U	0.227 U	0.198 U	0.162 U	4.5 U	24.3 U	0.0233 U
PCB 79	µg/kg	506	160	16.6	6.56	350	179	13.1	5.4	11.9	3.72 J	460	236	14.5
PCB 80	µg/kg	7.27 U	11.8 U	0.191 U	0.36 U	3.85 U	5.69 U	0.514 J	0.195 J	0.288 J	0.144 J	3.48 U	18.8 U	0.0309 J
PCB 81	µg/kg	10.1 U	16.2 U	0.275 U	0.52 U	5.66 U	8.02 U	0.29 U	0.265 U	0.231 U	0.186 U	4.93 U	26.4 U	0.0241 U
PCB 82	µg/kg	14.3 U	33.4 U	1.21 U	2.15 U	13.4 U	19 U	1.44 U	1.61 U	0.843 U	1.19 U	10.1 U	41.7 U	0.0298 U
PCBs 83 + 99	µg/kg	9.14 U	21.5 U	17.8	10.5 J	91.4	12.2 U	41.3	10.7	10.2	4.59 J	6.45 U	36.8 J	0.0224 U
PCB 84	µg/kg	7.46 U	22 U	7.16	3.35 J	32.1 J	12 U	15.8	2.66 J	5.6 J	1.13 J	7.61 U	21.3 U	0.656 J
PCB 85	µg/kg	9.17 U	21.6 U	0.568 U	1.02 U	8.63 U	12.3 U	0.68 U	0.758 U	0.399 U	0.561 U	6.47 U	26.9 U	0.0233 U
PCBs 86 + 87 + 97‡ + 109 + 119 +125	µg/kg	17300	5620	640	309	12500	6660	549	231	560	176	16300	8760	543

Table 6-1
ALS PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Analyte	Station ID	RM11E-PW001		RM11E-PW002		RM11E-PW003		RM11E-PW004		RM11E-PW005		RM11E-PW006		RM11E-PW007
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Surface Water
	Sample ID	RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP002A	RM11E-PWW002A	RM11E-PWP003A	RM11E-PWW003A	RM11E-PWP004B	RM11E-PWW004B	RM11E-PWP005A	RM11E-PWW005A	RM11E-PWP006A	RM11E-PWW006A	RM11E-PWW007
	Units													
PCB 88	µg/kg	6.6 U	19.5 U	0.354 U	0.793 U	7.16 U	10.6 U	0.348 U	0.659 U	0.338 U	0.456 U	6.74 U	18.9 U	0.0187 U
PCB 89	µg/kg	12.1 U	28.2 U	0.771 U	1.38 U	11.3 U	16 U	0.922 U	1.03 U	0.541 U	0.761 U	8.47 U	35.2 U	0.0196 U
PCBs 90 + 101 + 113	µg/kg	7.84 U	34.6 J	82.6	41.9	205	10.5 U	150	31.7	45.9	16.1 J	182	77.6 J	0.0203 U
PCB 91	µg/kg	22.1 J	15.7 U	30	11	91.7	8.53 U	55.8	12.1	12.1	3.67 J	82.2	15.2 U	1.05 U
PCB 92	µg/kg	9.38 U	22.1 U	13.3 J	7.33	54	12.5 U	28	6.21	8.75	0.545 U	6.62 U	27.5 U	0.0245 U
PCB 93	µg/kg	6.55 U	19.3 U	0.374 U	0.837 U	7.1 U	10.6 U	0.367 U	0.695 U	0.357 U	0.482 U	6.68 U	18.7 U	0.0202 U
PCB 94	µg/kg	6.23 U	18.4 U	8.27	2.18 J	30.6	10 U	12.1	2.17 J	2.04 J	0.746 J	19.3 J	17.8 U	0.156 U
PCBs 95 + 100	µg/kg	66.6 J	48.8 J	115	40	239	20.3 J	224	38.1	73.2	14.1 J	215	78.1 J	4.06 J
PCB 96	µg/kg	11.1 J	13.5 U	8.19	1.82 J	26.6	7.36 U	14.6	1.89 J	2.48 J	0.387 J	27.2	13.1 U	0.231 J
PCBs 98 + 102	µg/kg	5.4 U	16 U	7.05 J	2.11 J	16.6 J	8.67 U	11.8 J	2.04 J	5.72 J	0.925 J	14.8 J	15.5 U	0.227 U
PCB 103	µg/kg	8.47 J	16 U	10.9	4.19 J	31.6 J	8.72 U	20.7	5.15	6.04	1.56 J	27.4 J	15.5 U	0.39 U
PCB 104	µg/kg	5.08 J	12.7 U	3.17 J	0.945 J	8.6 J	6.86 U	4.36	1.14 J	0.786 J	0.286 U	4.34 U	12.7 U	0.203 J
PCB 105	µg/kg	27.2 U	20.6 U	2.27	1.87 J	17.1 U	17.8 U	3.73	1.85 J	1.23	1.24 J	17.2 U	36 U	0.591
PCB 106	µg/kg	23.6 U	18.4 U	0.682 U	1.26 U	15.7 U	16.4 U	1.26 U	1.01 U	0.642 U	0.75 U	16.1 U	31.9 U	0.0858 U
PCB 107	µg/kg	24.9 U	19.4 U	0.604 U	1.11 U	16.6 U	17.3 U	1.12 U	0.886 U	0.599 J	0.664 U	17 U	33.7 U	0.271 J
PCBs 108 + 124	µg/kg	22.9 U	17.9 U	0.633 U	1.17 U	15.3 U	15.9 U	1.17 U	0.93 U	0.596 U	0.697 U	15.7 U	31 U	0.076 U
PCBs 110 + 115	µg/kg	5.57 U	13.1 U	28.3	14.6	72.2	7.42 U	59.6	11.6	19	6.44 J	3.93 U	30 J	0.0151 U
PCB 111[‡]	µg/kg	22100	8610	622	524	14500	9950	529	530	611	401	21000	12000	911
PCB 112	µg/kg	6.57 U	15.5 U	0.388 U	0.692 U	6.18 U	8.75 U	0.549 J	0.517 U	0.272 U	0.383 U	4.63 U	19.3 U	0.0176 U
PCB 114	µg/kg	26.9 U	20.4 U	0.717 U	1.32 U	16.3 U	18.4 U	1.37 U	1.05 U	0.664 U	0.779 U	17.9 U	35.5 U	0.0765 U
PCBs 116 + 117	µg/kg	6.85 U	16.1 U	2.64 J	0.733 U	6.44 U	9.12 U	2.84 J	0.547 U	0.288 U	0.405 U	4.83 U	20.1 U	0.0178 U
PCB 118	µg/kg	25.4 U	21 U	10.9	9.04	39.8 J	18.3 U	21	6.72	7.24	5.05	17.7 U	35.4 U	1.94 J
PCB 120	µg/kg	6.54 U	15.4 U	0.363 U	0.648 U	6.15 U	8.71 U	0.488 J	0.484 U	0.255 U	0.359 U	4.61 U	19.2 U	0.0172 U
PCB 121	µg/kg	5.53 U	13 U	0.322 U	0.575 U	5.2 U	7.36 U	0.385 U	0.429 U	0.226 U	0.318 U	3.9 U	16.2 U	0.0182 U
PCB 122	µg/kg	26.7 U	20.9 U	0.744 U	1.37 U	17.8 U	18.6 U	1.38 U	1.1 U	0.7 U	0.818 U	18.3 U	36.2 U	0.0822 U
PCB 123	µg/kg	25.4 U	19.8 U	0.722 U	1.33 U	16.9 U	18.1 U	1.32 U	1.05 U	0.673 U	0.77 U	18.5 U	34.2 U	0.0786 U
PCB 126	µg/kg	27.4 U	20 U	0.726 U	1.29 U	17.6 U	18.7 U	1.34 U	1.03 U	0.667 U	0.748 U	18.7 U	34.4 U	0.0654 U
PCB 127	µg/kg	28.8 U	22.5 U	0.656 U	1.21 U	19.2 U	20 U	1.21 U	0.963 U	0.617 U	0.722 U	19.7 U	39 U	0.0808 U
PCB 128	µg/kg	5.63 U	16.1 U	2.6 J	2.03 J	5.93 U	8.88 U	5.03 J	0.659 U	0.382 U	0.317 U	6.99 U	24.7 U	0.0549 U
PCBs 129 + 138 + 163	µg/kg	6.15 U	57.6 J	67.2	58.7	199	42.6 J	136	41.7	38.6	21.4	349	169 J	7.21 U
PCB 130	µg/kg	6.38 U	18.2 U	0.55 U	1.05 U	6.72 U	10.1 U	1.81 U	0.757 U	0.439 U	0.364 U	7.91 U	28 U	0.0661 U
PCB 131	µg/kg	4.89 U	14 U	0.407 U	0.77 U	5.16 U	7.72 U	1.34 U	0.559 U	0.325 U	0.269 U	6.07 U	21.5 U	0.0477 U
PCB 132	µg/kg	5.7 U	16.3 U	20.5	13.8	46.8 J	8.99 U	41.1	10	12.6	5.55	7.07 U	45 J	0.0587 U
PCB 133	µg/kg	6.09 U	17.4 U	0.507 U	0.962 U	6.42 U	9.61 U	4.07	0.698 U	0.405 U	0.335 U	7.56 U	26.8 U	0.0597 U
PCB 134	µg/kg	4.58 U	13.1 U	2.51 J	0.734 U	4.83 U	7.23 U	5.97 J	0.533 U	0.31 U	0.256 U	5.68 U	20.1 U	0.051 U
PCBs 135 + 154	µg/kg	16.2 J	13.1 U	10.1	7.69 J	73.2 J	9.29 J	23.8	6.89 J	8.33	2.7 J	47 J	30.6 J	1.11 J
PCB 136	µg/kg	13.8 J	11 U	26.1	13.2	66.1	5.79 U	52.2	11.5	17.3	4.89 J	66.2 J	31.5 J	1.32 J

Table 6-1
ALS PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Analyte	Station ID	RM11E-PW001		RM11E-PW002		RM11E-PW003		RM11E-PW004		RM11E-PW005		RM11E-PW006		RM11E-PW007
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Surface Water
	Sample ID	RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP002A	RM11E-PWW002A	RM11E-PWP003A	RM11E-PWW003A	RM11E-PWP004B	RM11E-PWW004B	RM11E-PWP005A	RM11E-PWW005A	RM11E-PWP006A	RM11E-PWW006A	RM11E-PWW007
	Units													
PCB 137	µg/kg	5.18 U	14.8 U	0.441 U	0.836 U	5.45 U	8.16 U	1.45 U	0.607 U	0.352 U	0.292 U	6.42 U	22.7 U	0.0534 U
PCBs 139 + 140	µg/kg	4.96 U	14.2 U	0.431 U	0.817 U	5.23 U	7.83 U	1.42 U	0.593 U	0.344 U	0.285 U	6.15 U	21.8 U	0.0515 U
PCB 141	µg/kg	47.1	15.7 U	16.2	13.5	87.7 J	14.3 J	31.5	10	8.57	5.35 J	124 J	24.2 U	0.0569 U
PCB 142	µg/kg	6.24 U	17.8 U	0.558 U	1.06 U	6.58 U	9.85 U	1.83 U	0.768 U	0.446 U	0.369 U	7.74 U	27.4 U	0.0633 U
PCB 143	µg/kg	6.01 U	17.2 U	0.586 U	1.11 U	6.34 U	9.49 U	1.92 U	0.806 U	0.468 U	0.387 U	7.46 U	26.4 U	0.0593 U
PCB 144	µg/kg	7.99 U	14.9 U	6.16	4.16 J	11.5 J	7.86 U	11	2.45 J	3.42	1.26 J	22.1 J	25.2 U	0.36 J
PCB 145	µg/kg	5.16 U	9.6 U	0.151 U	0.337 U	4.23 U	5.08 U	0.119 U	0.174 U	0.106 U	0.13 U	3.53 U	16.3 U	0.0125 U
PCB 146	µg/kg	4.69 U	13.4 U	10	9.17	52.7	7.4 U	22.1	7.39	6.57	2.6 J	5.82 U	20.6 U	0.0507 U
PCBs 147 + 149	µg/kg	4.93 U	41.7 J	88.7	58.8	247	31.4 J	178	44.3	54.7	20.1	299	160 J	5.69 U
PCB 148	µg/kg	8.23 U	15.3 U	0.688 J	0.496 U	6.74 U	8.09 U	1.79 J	0.388 J	0.156 U	0.191 U	5.62 U	25.9 U	0.0194 U
PCB 150	µg/kg	5.35 U	9.95 U	1.93 J	0.667 J	8.23 J	5.27 U	3.96	1.01 J	0.961 J	0.221 J	4.58 J	16.9 U	0.0602 U
PCB 151	µg/kg	25.2 J	19.9 J	49.2	31.7	116 J	23.1 J	92.8	22.5	25.7	11.2	152	90.6 J	3.22 J
PCB 152	µg/kg	5.92 U	11 U	0.182 U	0.405 U	4.85 U	5.82 U	0.143 U	0.209 U	0.127 U	0.156 U	4.04 U	18.7 U	0.0375 J
PCBs 153[‡] + 168	µg/kg	22500	8330	762	797	13600	9070	735	943	802	601	21800	11900	896
PCB 155	µg/kg	4.97 U	9.27 U	0.194 J	0.337 U	3.94 U	4.82 U	0.364 J	0.174 U	0.105 U	0.128 U	3.47 U	15.7 U	0.0149 U
PCBs 156 + 157	µg/kg	17.2 U	25.7 U	2.63	2.65 J	8.18 U	19.7 U	4.69	1.67 J	1.77 J	1.18 J	21.2 J	30.2 U	0.516 U
PCB 158	µg/kg	681	257	22.1 J	27.3	392	253	25.7	33.3	23.7	19.7	668	348	27.3
PCB 159	µg/kg	10.8 U	15.5 U	0.639 J	0.578 U	4.88 U	12.1 U	0.894 J	0.531 U	0.286 U	0.329 U	7.58 U	18.7 U	0.091 U
PCB 160	µg/kg	2.52 U	7.18 U	0.213 U	0.404 U	2.66 U	3.98 U	0.698 U	0.293 U	0.17 U	0.141 U	3.13 U	11.1 U	0.0274 U
PCB 161	µg/kg	4.3 U	12.3 U	0.35 U	0.662 U	4.53 U	6.79 U	1.15 U	0.481 U	0.279 U	0.231 U	5.34 U	18.9 U	0.0438 U
PCB 162	µg/kg	10.2 U	14.6 U	0.395 U	0.55 U	4.61 U	11.4 U	0.456 U	0.504 U	0.271 U	0.313 U	7.15 U	17.6 U	0.0436 U
PCB 164	µg/kg	4.17 U	11.9 U	3.99	3.13 J	4.39 U	6.57 U	8.11	0.505 U	2.12 J	1.28 J	5.17 U	18.3 U	0.0447 U
PCB 165	µg/kg	4.1 U	11.7 U	0.352 U	0.666 U	4.33 U	6.47 U	1.16 U	0.484 U	0.281 U	0.232 U	5.09 U	18 U	0.0429 U
PCB 166	µg/kg	4.14 U	11.8 U	0.364 U	0.689 U	4.36 U	6.52 U	1.2 U	0.501 U	0.291 U	0.241 U	5.13 U	18.2 U	0.0449 U
PCB 167	µg/kg	8.94 U	12.1 U	0.737 J	1.17 J	3.97 U	9.7 U	1.92 J	0.531 J	0.654 J	0.273 U	7.55 J	16.3 U	0.21 U
PCB 169	µg/kg	9.42 U	13.4 U	0.353 U	0.481 U	4.25 U	11.1 U	0.395 U	0.431 U	0.229 U	0.275 U	6.71 U	15.4 U	0.0405 U
PCB 170	µg/kg	15.7 U	24.2 U	10.9 J	11	53.4	15.8 U	20.7	8.45	7.49 J	6.34	128	78 J	3.1 U
PCBs 171 + 173	µg/kg	14.9 U	23 U	4.09 J	3.43 J	16.9 J	15 U	7.53	2.52 J	2.65 J	1.68 J	37.6 J	23.7 U	0.971 U
PCB 172	µg/kg	14.5 U	22.4 U	1.84 J	2.08 J	9.17 U	14.7 U	3.76	1.33 J	1.18 J	0.734 J	27.9 J	23.1 U	0.489 U
PCB 174	µg/kg	12.7 U	19.6 U	16.7	16.4	48.8	12.8 U	32	9.28	9.96	6.83	114	54.7 J	2.93 U
PCB 175	µg/kg	6.76 U	15.4 U	1.21 J	1.38 J	4.06 U	8.07 U	1.95 J	1.86 J	1.3 J	0.222 U	6.16 U	23.6 U	0.0157 U
PCB 176	µg/kg	4.88 U	11.1 U	2.16 J	0.29 U	2.93 U	5.82 U	4.46	0.275 U	0.0854 U	0.171 U	4.45 U	17 U	0.0124 U
PCB 177	µg/kg	13.8 U	21.4 U	9.57	10.3	47.5 J	14 U	17.9	6.52	5.78	3.33 J	95.4 J	34.9 J	1.85 U
PCB 178[‡]	µg/kg	18200	5990	622	796	10100	6970	555	997	733	619	18100	9190	879
PCB 179	µg/kg	4.92 U	12.8 J	10.1	8.62	43.2 J	5.87 U	20.5	5.85	5.31	2.54 J	56.1	17.2 U	0.0119 U
PCBs 180 + 193	µg/kg	16.9 J	32.6 J	23.1	24.6	95.4 J	14.1 J	42.6	15.2	12.3	9.25 J	286	87.8 J	6.34 U
PCB 181	µg/kg	11.9 U	18.4 U	0.427 U	0.749 U	7.52 U	12 U	0.502 U	0.646 U	0.169 U	0.318 U	7.22 U	18.9 U	0.0404 U

Table 6-1
ALS PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Analyte	Station ID	RM11E-PW001		RM11E-PW002		RM11E-PW003		RM11E-PW004		RM11E-PW005		RM11E-PW006		RM11E-PW007
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Porewater	Surface Water	Surface Water
	Sample ID	RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP002A	RM11E-PWW002A	RM11E-PWP003A	RM11E-PWW003A	RM11E-PWP004B	RM11E-PWW004B	RM11E-PWP005A	RM11E-PWW005A	RM11E-PWP006A	RM11E-PWW006A	RM11E-PWW007
	Units													
PCB 182	µg/kg	6.21 U	14.2 U	0.143 U	0.372 U	3.73 U	7.41 U	0.19 J	0.352 U	0.11 U	0.22 U	5.66 U	21.7 U	0.015 U
PCB 183	µg/kg	12.9 U	20 U	9.77	9.79 J	39.7 J	13.1 U	16.9	5.46 J	4.62 J	3.22 J	85.1 J	24 J	1.49 U
PCB 184	µg/kg	4.45 U	10.2 U	0.0953 U	0.249 U	2.67 U	5.3 U	0.115 U	0.236 U	0.0733 U	0.147 U	4.05 U	15.5 U	0.0106 U
PCB 185	µg/kg	12.7 U	19.6 U	1.92 J	1.83 J	11.9 J	12.8 U	3.32 J	1.33 J	0.879 J	0.685 J	15.4 J	20.2 U	0.29 J
PCB 186	µg/kg	4.71 U	10.7 U	0.104 U	0.272 U	2.82 U	5.62 U	0.126 U	0.257 U	0.08 U	0.16 U	4.29 U	16.4 U	0.0113 U
PCB 187	µg/kg	5.72 U	19.9 J	18.9	19.2	90.2	6.82 U	36.2	11.6	10.5	6.53	153 J	58.5 J	2.98 U
PCB 188	µg/kg	5.74 U	12.9 U	0.132 U	0.342 U	3.33 U	6.85 U	0.159 U	0.328 U	0.103 U	0.205 U	5.44 U	20.5 U	0.0141 U
PCB 189	µg/kg	10.2 U	16.1 U	0.326 U	0.574 U	6.72 U	10.4 U	0.665 J	0.487 U	0.128 U	0.239 U	5.91 U	15.7 U	0.113 U
PCB 190	µg/kg	9.67 U	15 U	2.15 J	2.93 J	6.13 U	9.76 U	4.61	1.92 J	1.53 J	1.02 J	33.5	15.4 U	0.71 U
PCB 191	µg/kg	11.1 U	17.1 U	0.367 U	0.644 U	7.02 U	11.2 U	0.864 J	0.555 U	0.38 J	0.273 U	6.74 U	17.7 U	0.129 U
PCB 192	µg/kg	10.6 U	16.3 U	0.36 U	0.631 U	6.67 U	10.7 U	0.423 U	0.545 U	0.143 U	0.268 U	6.4 U	16.8 U	0.0352 U
PCB 194	µg/kg	7.69 U	14.2 U	2.88 J	3 J	12.9 J	9.73 U	4.81	2.12 J	1.91 J	1.46 J	63.9	30.9 J	1.41 U
PCB 195	µg/kg	7.67 U	14.2 U	1.46 J	1.96 J	4.41 U	9.7 U	2.53 J	0.917 J	0.756 J	0.75 J	22.4 J	20.4 U	0.575 U
PCB 196	µg/kg	7.52 U	13.9 U	1.99 J	1.84 J	4.32 U	9.51 U	3.72	1.76 J	0.941 J	0.537 J	31.6 J	20 U	0.828 U
PCB 197	µg/kg	4.85 U	8.95 U	0.121 U	0.304 U	2.79 U	6.13 U	0.272 J	0.371 U	0.0883 U	0.163 U	3.79 U	12.9 U	0.0554 U
PCBs 198 + 199	µg/kg	7.19 U	13.3 U	3.62 J	3.89 J	24.8 J	9.09 U	6.61	3.28 J	2.04 J	1.68 J	56.9	19.2 U	1.47 U
PCB 200	µg/kg	5.29 U	9.76 U	0.476 J	0.394 J	3.04 U	6.69 U	0.941 J	0.413 U	0.0983 U	0.182 U	8.59 J	14.1 U	0.16 U
PCB 201	µg/kg	5.16 U	9.52 U	0.36 J	0.581 J	2.97 U	6.52 U	0.855 J	0.396 U	0.0943 U	0.174 U	5.36 J	13.8 U	0.158 U
PCB 202	µg/kg	6.21 J	10.3 U	0.805 J	0.913 J	3.22 U	6.98 U	1.73 J	0.8 J	0.552 J	0.378 J	11.4 J	14.6 U	0.374 J
PCB 203	µg/kg	6.43 U	11.9 U	1.88 J	2.17 J	11.8 J	8.14 U	3.04 J	1.54 J	1.05 J	0.217 U	32.2	17.2 U	0.757 U
PCB 204	µg/kg	5.18 U	9.55 U	0.134 U	0.336 U	2.98 U	6.55 U	0.186 U	0.41 U	0.0976 U	0.18 U	4.05 U	13.8 U	0.0136 U
PCB 205	µg/kg	6.64 U	11.8 U	0.208 J	0.42 U	3.66 U	8.17 U	0.315 J	0.508 U	0.163 J	0.226 U	5.1 U	17.3 U	0.0672 U
PCB 206	µg/kg	11.9 U	23.6 U	0.416 J	0.556 U	10.2 U	11.9 U	0.549 J	0.703 J	0.226 U	0.379 U	9.24 U	33.3 U	0.283 U
PCB 207	µg/kg	5.66 U	12 U	0.243 U	0.385 U	3.76 U	8.5 U	0.217 U	0.373 U	0.122 U	0.253 U	5.09 U	13.5 U	0.0402 U
PCB 208	µg/kg	5.15 U	11 U	0.221 U	0.353 U	3.34 U	7.34 U	0.19 U	0.338 U	0.162 J	0.224 U	4.42 U	11.8 U	0.0587 U
PCB 209	µg/kg	9.45 U	17 U	0.17 U	0.734 J	7.3 U	7.4 U	0.244 J	1.26 J	1.34	1.63 J	5.15 U	17.9 U	0.0429
Total PCBs														
Total PCBs (RI Calc)[1]	µg/kg	2360 JT	803 JT	1640 JT	633 JT	4710 JT	622 JT	3810 JT	539 JT	831 JT	293 JT	6780 JT	2070 JT	64.1 JT

Notes:

‡ Performance reference compound analyzed at time zero

[1] Performance reference compounds excluded from RI calculation sum.

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

Definition of data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

ALS-Reported PE Results						MIT-Reported PE Results[1]				
Station ID		RM11E-PW001		RM11E-PW004		Station ID	RM11E-PW001		RM11E-PW004	
Exposure Matrix		Porewater	Surface Water	Porewater	Surface Water	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
Sample ID		RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP004B	RM11E-PWW004B	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
Analyte	Units					Analyte				
PCB Congeners										
PCB 1	µg/kg	3.45 U	6.74 U	3.06	0.265 U	PCB 1	ND	ND	ND	ND
PCB 2	µg/kg	5.23 U	10.1 U	0.205 U	0.339 U	PCB 2	ND	ND	ND	ND
PCB 3	µg/kg	5.46 U	10.4 U	0.209 U	0.357 U	PCB 3	ND	ND	ND	ND
PCB 4	µg/kg	66.8	4.04 U	314	2.11	PCBs 4 + 10	54.55	ND	146.47	35.39
PCB 5	µg/kg	2.35 U	4.87 U	0.102 U	0.142 U	PCBs 5 + 8	10.98	ND	16.18	0.28
PCB 6	µg/kg	2.39 U	4.94 U	2.72	0.132 U	PCB 6	2.41	ND	5.44	0.07
PCB 7	µg/kg	2.11 U	4.36 U	0.907 J	0.12 U	PCBs 7 + 9	2.10	ND	3.82	0.22
PCB 8	µg/kg	6.4 J	4.34 U	9.77	0.121 U	--	--	--	--	--
PCB 9	µg/kg	2.64 U	5.46 U	1.15 J	0.141 U	--	--	--	--	--
PCB 10	µg/kg	1.43 U	3.27 U	17.6	0.0974 U	--	--	--	--	--
PCB 11	µg/kg	2.67 U	5.52 U	2.49 J	0.696 J	PCB 11	ND	ND	ND	1.07
PCBs 12 + 13	µg/kg	2.44 U	5.04 U	0.712 J	0.131 U	PCB 12	ND	ND	32.05	ND
--	µg/kg	--	--	--	--	PCB 13	ND	ND	ND	ND
PCB 14	µg/kg	2.4 U	4.96 U	0.0976 U	0.136 U	PCB 14	ND	ND	ND	0.53
PCB 15	µg/kg	63.5	6.59 U	6.02	0.392 J	PCB 15	22.62	7.93	12.76	0.00
PCB 16	µg/kg	14.1 U	28.2 U	1.74 J	0.661 U	PCBs 16 + 32	25.47	1.65	78.03	2.00
PCB 17	µg/kg	66.2	24.7 U	145	4.57	PCB 17	30.29	3.74	121.57	2.86
PCB 18	µg/kg	29.3	16.8 U	1.95 J	0.412 U	PCB 18	18.16	ND	24.17	0.59
PCB 19	µg/kg	153	18.2 U	601	8.52	PCB 19	167.38	4.70	350.29	5.24
PCBs 20 + 28[‡]	µg/kg	17800	374	443	5.89	PCBs 20+21+33	35.79	ND	16.92	ND
PCBs 21 + 33	µg/kg	84.6 U	12.1 U	9.07	0.509 U	--	--	--	--	--
PCB 22	µg/kg	99.6 U	14.2 U	0.84 U	0.591 U	PCB 22	ND	ND	1.79	ND
PCB 23	µg/kg	91.9 U	13.1 U	0.773 U	0.544 U	PCBs 23 + 34	ND	ND	ND	ND
PCB 24	µg/kg	8.04 U	16.2 U	0.27 U	0.366 U	PCBs 24+27	18.78	ND	35.90	1.00
PCB 25	µg/kg	76.2 U	10.9 U	3.45	0.432 U	PCBs 25+26	44.76	44.57	7.92	0.40
PCBs 26 + 29	µg/kg	97.4 U	13.9 U	4.36	0.587 U	--	--	--	--	--
PCB 27	µg/kg	17.8 J	17.6 U	48	1.39 J	--	--	--	--	--
--	µg/kg	--	--	--	--	PCBs 28[‡]+31	8898.53	758.07	271.17	6.49
--	µg/kg	--	--	--	--	PCB 29	284.70 **R**	21.20 **R**	9.53	ND
PCB 30	µg/kg	19.5 J	23.9 U	23.4	0.94 J	PCB 30	24.40	1.98	1.84	ND
PCB 31	µg/kg	95.6 U	13.7 U	9.89	0.532 U	--	--	--	--	--
PCB 32	µg/kg	8.15 U	16.4 U	65.9	2.15	--	--	--	--	--
PCB 34	µg/kg	114 U	16.2 U	0.911 U	0.641 U	--	--	--	--	--
PCB 35	µg/kg	112 U	15.9 U	0.861 U	0.606 U	PCB 35	ND	ND	ND	ND
PCB 36	µg/kg	92.1 U	13.2 U	0.775 U	0.545 U	PCB 36	1.59	ND	ND	0.64
PCB 37	µg/kg	147 U	21.7 U	1.08 U	0.756 U	PCB 37	5.78	ND	1.73	0.00
PCB 38	µg/kg	104 U	14.8 U	0.884 U	0.622 U	PCB 38	496.92 **R**	106.51 **R**	27.63	3.46
PCB 39	µg/kg	84.9 U	12.1 U	0.733 U	0.515 U	PCB 39	ND	ND	ND	ND
PCBs 40 + 71	µg/kg	7.1 U	11.6 U	34.5	3.62 J	PCB 40	4.37	ND	3.00	0.18
PCB 41	µg/kg	9.09 U	14.8 U	0.575 U	0.562 U	PCBs 41+64+68	7.37	2.93	8.76	1.26
PCB 42	µg/kg	14.1 J	9.72 U	5.63 J	1.01 J	PCB 42	13.51	3.32	8.58	0.68

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

ALS-Reported PE Results						MIT-Reported PE Results[1]				
Station ID		RM11E-PW001		RM11E-PW004		Station ID	RM11E-PW001		RM11E-PW004	
Exposure Matrix		Porewater	Surface Water	Porewater	Surface Water	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
Sample ID		RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP004B	RM11E-PWW004B	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
Analyte	Units					Analyte				
PCBs 43 + 73	µg/kg	6.59 U	10.8 U	0.406 U	0.397 U	PCB 43	ND	ND	ND	ND
PCBs 44 + 47[‡] + 65	µg/kg	14100	2120	718	88.4	PCB 44	21.21	5.22	20.07	1.68
PCBs 45 + 51	µg/kg	71.4 J	34.1 J	215	18.6	PCB 45	2.04	ND	2.51	ND
PCB 46	µg/kg	8.64 U	14.1 U	10.5	0.902 J	PCB 46	5.43	ND	11.70	0.39
--	µg/kg	--	--	--	--	PCBs 47[‡]+48+75	9367.10	1601.90	502.89	64.19
PCB 48	µg/kg	6.63 U	10.9 U	2.54 J	0.419 U	--	--	--	--	--
PCB 49	µg/kg	181	34.8 J	182	24.3	PCB 49	166.10	27.29	155.33	12.53
PCBs 50 + 53	µg/kg	122	25 J	244	16.3	PCB 50	9.26	1.24	11.51	1.00
--	µg/kg	--	--	--	--	PCB 51	63.88	8.49	169.95	9.20
PCB 52	µg/kg	89 J	12.3 U	224	25.8	PCB 52	101.35	ND	143.61	10.89
--	µg/kg	--	--	--	--	PCB 53	126.18	7.56	189.16	7.49
PCB 54[‡]	µg/kg	11500	74.2 J	387	6.35	PCB 54[‡]	4741.47	584.59	230.07	5.42
PCB 55	µg/kg	6.51 U	10.6 U	0.379 U	0.37 U	PCB 55	ND	ND	ND	ND
PCB 56	µg/kg	30.3 J	14.5 U	1.97 J	0.375 J	PCBs 56+60	23.64	6.88	4.59	0.60
PCB 57	µg/kg	6.11 U	9.96 U	0.376 U	0.368 U	PCB 57	10.57	5.17	0.64	0.16
PCB 58	µg/kg	5.84 U	9.51 U	5.78	1.02 J	PCB 58	1.93	1.37	ND	ND
PCBs 59 + 62 + 75	µg/kg	7.78 U	24.4 J	9.99 J	2 J	PCB 59	ND	ND	ND	ND
PCB 60	µg/kg	8.03 U	13 U	0.224 U	0.21 U	--	--	--	--	--
PCB 61	µg/kg	5.86 U	9.54 U	0.353 U	0.345 U	PCB 61	ND	ND	ND	ND
PCB 63	µg/kg	5.87 U	9.56 U	0.341 U	0.334 U	PCB 63	ND	ND	1.31	0.48
PCB 64	µg/kg	3.76 U	6.12 U	3.49	0.645 J	--	--	--	--	--
PCB 66	µg/kg	6.27 U	10.3 U	10.5	2.65 J	PCBs 66+80	10.74	7.12	9.50	2.24
PCB 67	µg/kg	5.19 U	8.45 U	0.326 U	0.319 U	PCB 67	5.44	2.42	0.46	0.11
PCB 68	µg/kg	5.23 U	8.52 U	1.44 J	0.307 U	--	--	--	--	--
PCB 69	µg/kg	4.42 U	7.2 U	2.8 J	0.276 U	PCB 69	1.98	ND	ND	0.40
--	µg/kg	--	--	--	--	PCBs 69+73 [1]	1.98	ND	14.02	ND
PCBs 70 + 74 + 76	µg/kg	5.09 U	8.29 U	13.8	4.01 J	PCB 70	8.16	2.10	12.65	1.85
--	µg/kg	--	--	--	--	PCBs 71+72	16.44	4.59	28.63	2.21
PCB 72	µg/kg	5.59 U	9.11 U	0.34 U	0.332 U	--	--	--	--	--
--	µg/kg	--	--	--	--	PCB 73	7.10	ND	ND	0.97
--	µg/kg	--	--	--	--	PCB 74	2.12	ND	3.06	0.80
--	µg/kg	--	--	--	--	PCB 76	ND	ND	0.49	ND
PCB 77	µg/kg	10.8 U	17.8 U	0.36 J	0.268 U	PCB 77	ND	ND	0.38	0.17
PCB 78	µg/kg	9.39 U	15.2 U	0.242 U	0.227 U	PCB 78	ND	ND	ND	ND
PCB 79	µg/kg	506	160	13.1	5.4	PCB 79	ND	ND	ND	ND
PCB 80	µg/kg	7.27 U	11.8 U	0.514 J	0.195 J	--	--	--	--	--
PCB 81	µg/kg	10.1 U	16.2 U	0.29 U	0.265 U	PCB 81	ND	ND	0.43	0.73
PCB 82	µg/kg	14.3 U	33.4 U	1.44 U	1.61 U	PCB 82	7.50	ND	7.51	1.26
PCBs 83 + 99	µg/kg	9.14 U	21.5 U	41.3	10.7	PCBs 83+109	1.62	ND	1.62	0.33
PCB 84	µg/kg	7.46 U	22 U	15.8	2.66 J	PCB 84	10.49	2.81	15.23	1.66
PCB 85	µg/kg	9.17 U	21.6 U	0.68 U	0.758 U	PCBs 85+120	ND	ND	2.54	1.07

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

ALS-Reported PE Results						MIT-Reported PE Results[1]				
Station ID		RM11E-PW001		RM11E-PW004		Station ID	RM11E-PW001		RM11E-PW004	
Exposure Matrix		Porewater	Surface Water	Porewater	Surface Water	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
Sample ID		RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP004B	RM11E-PWW004B	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
Analyte	Units					Analyte				
PCBs 86 + 87 + 97‡+ 109 + 119 +125	µg/kg	17300	5620	549	231	--	--	--	--	--
--	µg/kg	--	--	--	--	PCBs 87+115	ND	ND	22.10	ND
PCB 88	µg/kg	6.6 U	19.5 U	0.348 U	0.659 U	PCB 88	ND	ND	ND	ND
PCB 89	µg/kg	12.1 U	28.2 U	0.922 U	1.03 U	PCBs 89+90+101	114.18	32.09	166.23	20.20
PCBs 90 + 101 + 113	µg/kg	7.84 U	34.6 J	150	31.7	--	--	--	--	--
PCB 91	µg/kg	22.1 J	15.7 U	55.8	12.1	PCB 91	25.38	6.70	55.56	7.85
PCB 92	µg/kg	9.38 U	22.1 U	28	6.21	PCB 92	18.11	5.06	26.54	4.20
PCB 93	µg/kg	6.55 U	19.3 U	0.367 U	0.695 U	PCB 93	ND	ND	ND	ND
PCB 94	µg/kg	6.23 U	18.4 U	12.1	2.17 J	PCB 94	6.14	ND	12.03	1.52
PCB 95	µg/kg					PCBs 95+121	86.50	14.07	161.35	14.28
PCBs 95 + 100	µg/kg	66.6 J	48.8 J	224	38.1	--	--	--	--	--
PCB 96	µg/kg	11.1 J	13.5 U	14.6	1.89 J	PCB 96	11.70	2.30	14.78	1.20
--	µg/kg	--	--	--	--	PCBs 97‡+86+125	13550.25	5309.65	402.08	202.50
PCBs 98 + 102	µg/kg	5.4 U	16 U	11.8 J	2.04 J	PCBs 98+102	8.37	2.04	12.45	1.65
--	µg/kg	--	--	--	--	PCB 99	27.36	12.94	28.92	6.63
--	µg/kg	--	--	--	--	PCB 100	12.17	4.63	32.65	5.40
PCB 103	µg/kg	8.47 J	16 U	20.7	5.15	PCB 103	10.02	3.26	14.30	3.31
PCB 104	µg/kg	5.08 J	12.7 U	4.36	1.14 J	PCB 104	ND	ND	ND	ND
PCB 105	µg/kg	27.2 U	20.6 U	3.73	1.85 J	PCB 105	4.80	ND	4.18	1.22
PCB 106	µg/kg	23.6 U	18.4 U	1.26 U	1.01 U	PCBs 106+118	26.07	12.38	21.45	5.68
PCB 107	µg/kg	24.9 U	19.4 U	1.12 U	0.886 U	PCBs 107+108+123	7.33	3.32	8.88	1.58
PCBs 108 + 124	µg/kg	22.9 U	17.9 U	1.17 U	0.93 U	--	--	--	--	--
PCBs 110 + 115	µg/kg	5.57 U	13.1 U	59.6	11.6	PCB 110	60.55	11.50	74.84	9.50
PCB 111‡	µg/kg	22100	8610	529	530	PCBs 111‡+116+117	16544.68	9872.47	466.59	366.58
PCB 112	µg/kg	6.57 U	15.5 U	0.549 J	0.517 U	PCB 112	ND	ND	ND	ND
PCB 114	µg/kg	26.9 U	20.4 U	1.37 U	1.05 U	PCB 114	ND	ND	ND	ND
PCBs 116 + 117	µg/kg	6.85 U	16.1 U	2.84 J	0.547 U	--	--	--	--	--
PCB 118	µg/kg	25.4 U	21 U	21	6.72	--	--	--	--	--
--	µg/kg	--	--	--	--	PCB 119	5.27	2.37	9.88	2.10
PCB 120	µg/kg	6.54 U	15.4 U	0.488 J	0.484 U	--	--	--	--	--
PCB 121	µg/kg	5.53 U	13 U	0.385 U	0.429 U	--	--	--	--	--
PCB 122	µg/kg	26.7 U	20.9 U	1.38 U	1.1 U	PCB 122	4.63 **J**	8.33 **J**	3.95	7.52
PCB 123	µg/kg	25.4 U	19.8 U	1.32 U	1.05 U	--	--	--	--	--
--	µg/kg	--	--	--	--	PCB 124	ND	1.91	0.65	ND
PCB 126	µg/kg	27.4 U	20 U	1.34 U	1.03 U	PCB 126	10.10	9.35	ND	ND
PCB 127	µg/kg	28.8 U	22.5 U	1.21 U	0.963 U	PCB 127	ND	ND	ND	ND
PCB 128	µg/kg	5.63 U	16.1 U	5.03 J	0.659 U	PCB 128	7.82	1.61	7.98	1.27
PCBs 129 + 138 + 163	µg/kg	6.15 U	57.6 J	136	41.7	PCB 129	1024.50 **R**	829.72 **R**	31.30	40.91
PCB 130	µg/kg	6.38 U	18.2 U	1.81 U	0.757 U	PCB 130	3.86	ND	4.03	0.75

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

ALS-Reported PE Results						MIT-Reported PE Results[1]				
Station ID		RM11E-PW001		RM11E-PW004		Station ID	RM11E-PW001		RM11E-PW004	
Exposure Matrix		Porewater	Surface Water	Porewater	Surface Water	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
Sample ID		RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP004B	RM11E-PWW004B	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
Analyte	Units					Analyte				
PCB 131	µg/kg	4.89 U	14 U	1.34 U	0.559 U	PCB 131	ND	ND	1.00	ND
PCB 132	µg/kg	5.7 U	16.3 U	41.1	10	--	--	--	--	--
PCB 133	µg/kg	6.09 U	17.4 U	4.07	0.698 U	PCBs 133+165	3.40	3.21	0.90	0.26
PCB 134	µg/kg	4.58 U	13.1 U	5.97 J	0.533 U	PCBs 134+143	7.56	2.67	8.85	1.34
PCBs 135 + 151	µg/kg	--	--	--	--	PCB 135	34.99	16.45	30.45	5.01
PCBs 135 + 154	µg/kg	16.2 J	13.1 U	23.8	6.89 J	--	--	--	--	--
PCB 136	µg/kg	13.8 J	11 U	52.2	11.5	PCB 136	30.48	5.80	49.02	6.32
PCB 137	µg/kg	5.18 U	14.8 U	1.45 U	0.607 U	PCB 137	ND	ND	1.07	0.30
--	µg/kg	--	--	--	--	PCBs 138+160	61.25	10.95	72.65	10.14
PCBs 139 + 140	µg/kg	4.96 U	14.2 U	1.42 U	0.593 U	PCBs 139+149	121.54	22.72	177.90	22.46
--	µg/kg	--	--	--	--	PCB 140	ND	ND	0.99	0.25
PCB 141	µg/kg	47.1	15.7 U	31.5	10	PCB 141	29.98	6.22	37.04	4.71
PCB 142	µg/kg	6.24 U	17.8 U	1.83 U	0.768 U	PCB 142	22.52	18.93	4.15	1.51
PCB 143	µg/kg	6.01 U	17.2 U	1.92 U	0.806 U	--	--	--	--	--
PCB 144	µg/kg	7.99 U	14.9 U	11	2.45 J	PCB 144	9.58	1.32	10.80	1.45
PCB 145	µg/kg	5.16 U	9.6 U	0.119 U	0.174 U	PCB 145	ND	ND	ND	ND
PCB 146	µg/kg	4.69 U	13.4 U	22.1	7.39	PCBs 146+161	21.43	8.56	20.29	3.73
PCBs 147 + 149	µg/kg	4.93 U	41.7 J	178	44.3	PCB 147	5.48	2.00	14.09	2.36
PCB 148	µg/kg	8.23 U	15.3 U	1.79 J	0.388 J	PCB 148	ND	ND	1.90	0.60
PCB 150	µg/kg	5.35 U	9.95 U	3.96	1.01 J	PCB 150	ND	ND	ND	ND
PCB 151	µg/kg	25.2 J	19.9 J	92.8	22.5	PCB 151	55.05	11.84	71.42	9.99
PCB 152	µg/kg	5.92 U	11 U	0.143 U	0.209 U	PCB 152	ND	ND	1.76	0.32
PCBs 153[‡] + 168	µg/kg	22500	8330	735	943	PCBs 153[‡]+132	15608.33	9692.55	549.75	450.69
PCB 154	µg/kg	--	--	--	--	PCB 154	2.24	ND	4.57	0.98
PCB 155	µg/kg	4.97 U	9.27 U	0.364 J	0.174 U	PCB 155	ND	ND	0.46	0.21
PCBs 156 + 157	µg/kg	17.2 U	25.7 U	4.69	1.67 J	PCB 156	4.94	ND	5.39	0.82
--	µg/kg	--	--	--	--	PCB 157	ND	ND	ND	ND
PCB 158	µg/kg	681	257	25.7	33.3	PCB 158	9.47	ND	9.93	1.35
PCB 159	µg/kg	10.8 U	15.5 U	0.894 J	0.531 U	PCB 159	ND	ND	ND	ND
PCB 160	µg/kg	2.52 U	7.18 U	0.698 U	0.293 U	--	--	--	--	--
PCB 161	µg/kg	4.3 U	12.3 U	1.15 U	0.481 U	PCBs 161+164	ND	ND	ND	ND
PCB 162	µg/kg	10.2 U	14.6 U	0.456 U	0.504 U	PCB 162	ND	ND	ND	ND
--	µg/kg	--	--	--	--	PCBs 163+164	41.02	4.57	52.16	7.88
PCB 164	µg/kg	4.17 U	11.9 U	8.11	0.505 U	--	--	--	--	--
PCB 165	µg/kg	4.1 U	11.7 U	1.16 U	0.484 U	--	--	--	--	--
PCB 166	µg/kg	4.14 U	11.8 U	1.2 U	0.501 U	PCB 166	ND	ND	ND	ND
PCB 167	µg/kg	8.94 U	12.1 U	1.92 J	0.531 J	PCB 167	2.48	ND	2.09	0.41
--	µg/kg	--	--	--	--	PCB 168	32.60	ND	39.96	ND
PCB 169	µg/kg	9.42 U	13.4 U	0.395 U	0.431 U	PCB 169	ND	ND	ND	ND
PCB 170	µg/kg	15.7 U	24.2 U	20.7	8.45	PCBs 170+190	14.71	4.99	19.06	3.36
PCBs 171 + 173	µg/kg	14.9 U	23 U	7.53	2.52 J	PCB 171	7.06	ND	7.67	1.01
PCB 172	µg/kg	14.5 U	22.4 U	3.76	1.33 J	PCBs 172+192	3.47	ND	4.17	0.66

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

ALS-Reported PE Results						MIT-Reported PE Results[1]				
Station ID		RM11E-PW001		RM11E-PW004		Station ID	RM11E-PW001		RM11E-PW004	
Exposure Matrix		Porewater	Surface Water	Porewater	Surface Water	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
Sample ID		RM11E-PWP001B	RM11E-PWW001B	RM11E-PWP004B	RM11E-PWW004B	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
Analyte	Units					Analyte				
--	µg/kg	--	--	--	--	PCB 173	ND	ND	0.83	ND
PCB 174	µg/kg	12.7 U	19.6 U	32	9.28	PCBs 174+181	25.82	5.68	33.02	4.41
PCB 175	µg/kg	6.76 U	15.4 U	1.95 J	1.86 J	PCB 175	24.94	19.04	2.46	1.64
PCB 176	µg/kg	4.88 U	11.1 U	4.46	0.275 U	PCB 176	4.12	ND	5.61	0.63
PCB 177	µg/kg	13.8 U	21.4 U	17.9	6.52	PCB 177	15.88	3.75	19.45	2.93
PCB 178[‡]	µg/kg	18200	5990	555	997	PCB 178[‡]	12488.83	7878.16	362.54	485.25
PCB 179	µg/kg	4.92 U	12.8 J	20.5	5.85	PCB 179	14.65	3.24	19.87	3.11
PCBs 180 + 193	µg/kg	16.9 J	32.6 J	42.6	15.2	PCBs 180+193	38.69	8.30	56.91	7.62
PCB 181	µg/kg	11.9 U	18.4 U	0.502 U	0.646 U	--	--	--	--	--
PCB 182	µg/kg	6.21 U	14.2 U	0.19 J	0.352 U	PCBs 182+187	35.25	8.69	44.52	6.69
PCB 183	µg/kg	12.9 U	20 U	16.9	5.46 J	PCB 183	15.01	4.60	18.24	2.65
PCB 184	µg/kg	4.45 U	10.2 U	0.115 U	0.236 U	PCB 184	ND	ND	0.13	0.22
PCB 185	µg/kg	12.7 U	19.6 U	3.32 J	1.33 J	PCB 185	4.44	ND	4.48	0.78
PCB 186	µg/kg	4.71 U	10.7 U	0.126 U	0.257 U	PCB 186	ND	ND	ND	ND
PCB 187	µg/kg	5.72 U	19.9 J	36.2	11.6	--	--	--	--	--
PCB 188	µg/kg	5.74 U	12.9 U	0.159 U	0.328 U	PCB188	ND	ND	ND	ND
PCB 189	µg/kg	10.2 U	16.1 U	0.665 J	0.487 U	PCB 189	ND	ND	0.84	ND
PCB 190	µg/kg	9.67 U	15 U	4.61	1.92 J	--	--	--	--	--
PCB 191	µg/kg	11.1 U	17.1 U	0.864 J	0.555 U	PCB 191	ND	ND	1.15	ND
PCB 192	µg/kg	10.6 U	16.3 U	0.423 U	0.545 U	--	--	--	--	--
PCB 194	µg/kg	7.69 U	14.2 U	4.81	2.12 J	PCB 194	4.59	ND	8.04	1.00
PCB 195	µg/kg	7.67 U	14.2 U	2.53 J	0.917 J	PCB 195	2.90	ND	3.29	0.65
PCB 196	µg/kg	7.52 U	13.9 U	3.72	1.76 J	PCBs 196+203	6.11	3.72	10.60	1.20
PCB 197	µg/kg	4.85 U	8.95 U	0.272 J	0.371 U	PCB 197	ND	ND	0.47	ND
PCBs 198 + 199	µg/kg	7.19 U	13.3 U	6.61	3.28 J	PCB 198	4.21	2.92	0.65	ND
--	µg/kg	--	--	--	--	PCB 199	5.05	2.72	8.02	1.33
PCB 200	µg/kg	5.29 U	9.76 U	0.941 J	0.413 U	PCB 200	ND	ND	1.17	ND
PCB 201	µg/kg	5.16 U	9.52 U	0.855 J	0.396 U	PCB 201	1.45	ND	1.34	ND
PCB 202	µg/kg	6.21 J	10.3 U	1.73 J	0.8 J	PCB 202	ND	ND	ND	ND
PCB 203	µg/kg	6.43 U	11.9 U	3.04 J	1.54 J	--	--	--	--	--
PCB 204	µg/kg	5.18 U	9.55 U	0.186 U	0.41 U	PCB 204	ND	ND	0.38	ND
PCB 205	µg/kg	6.64 U	11.8 U	0.315 J	0.508 U	PCB 205	ND	ND	0.56	ND
PCB 206	µg/kg	11.9 U	23.6 U	0.549 J	0.703 J	PCB 206	ND	ND	1.04	ND
PCB 207	µg/kg	5.66 U	12 U	0.217 U	0.373 U	PCB 207	ND	ND	0.16	ND
PCB 208	µg/kg	5.15 U	11 U	0.19 U	0.338 U	PCB 208	ND	ND	0.16	ND
PCB 209	µg/kg	9.45 U	17 U	0.244 J	1.26 J	PCB 209	ND	ND	ND	ND
Total PCBs										
Total PCBs (RI Calc)[3]	µg/kg	2360 JT	803 JT	3810 JT	539 JT	Total PCBs (RI Calculation)[3]	2270	470	3328	373

Table 6-2
Comparison of ALS and MIT PCB Congener Results in Sediment-Exposed and Surface Water-Exposed Polyethylene

Notes:

time zero

-- = Not Analyzed

ND = Not Detected above MITs method detection limits (MDLs).

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

[1] Surrogate corrected based on recovery of PCBs

[2] For Congeners 90 and 73, the concentrations were sufficiently high in the PWP004 samples so that the peaks could not be separately resolved. For PWP004, those are reported then as a co-eluted results.

[3] Performance reference compounds excluded from RI calculation sum.

Definition of ALS data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

T = The associated numerical value was mathematically derived (e.g., from summing multiple analyte results such as Aroclors, or calculating the average of multiple results for a single analyte).

Definition of MIT data qualifiers:

R = MIT recommended rejecting these data due to interference from PRCs.

J = MIT identified potential interference due to the injection standard, and qualified the data as an estimate

Table 6-3
Parameters for Derivation of Porewater/Surface Water from Polyethylene and Data Source

Parameters	Derivation	Data Source/Reference
Time Zero Polyethylene (PE) Concentration	---	ALS - Table 8-2 MIT - Table 8-4
Time Final PE Concentration Sediment	---	ALS - Table 8-1 MIT - Table 8-3
Time Final PE Concentration Water	---	
Octanol-water Partitioning Coefficient (K_{ow})	Published values	Hawker D.W. and D.W. Connell, 2008. Environ. Sci. Technol. 22: 382-387, 1988.
PE-water Partitioning Coefficient (K_{pew})	Published values (K_{ow} - 0.287)	Fernandez et al, 2009. Environ. Sci. Technol., 43, 8888-8894
Fractional PRC[1] Lost	$f_{PRC\ lost}=(C_{PRC,T0} - C_{PRC,Tfinal}) \div C_{PRC,T0}$	Gschwend et al. 2014. SERDP/ESTCP ER-200915[2]
Fractional PE Equilibration in sediment-exposed PE	PRC-Correction Calculator	Gschwend et al. 2014. SERDP/ESTCP ER-200915[3]
Fractional PE Equilibration in water-exposed PE	Regression analysis, $r^2 > 0.75$	Lohmann, et al. 2005. Environ. Sci. Technol. 39, 141-148
	Average homolog PRC loss (#Cl 2 - 4 vs. 5 - 8) $r^2 < 0.75$	Gschwend, personal communication
Equilibrated PE Concentration	C_{PE} = PCB Congener Concentration / Fractional Equilibration	Gschwend et al. 2014.
Estimated porewater/water concentration	$C_{pw} = C_{PE} / K_{pew}$	

Notes:
[1] PRC = performance reference compound
[2] https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Sediments/ER-200915/ER-200915
[3] https://www.serdp-estcp.org/Tools-and-Training/Tools/PRC-Correction-Calculator

Table 6-4
Comparison of ALS-Reported Performance Reference Compound Results in time-zero and time-final Polyethylene

"High" PRC Load Stations

Analyte	log K_{pew} [1]	# Cl [2]	Station ID	RM11E-PW001					RM11E-PW003					RM11E-PW006				
			Exposure Matrix	Time Zero	Porewater		Surface Water		Time Zero	Porewater		Surface Water		Time Zero	Porewater		Surface Water	
			Sample ID	RM11E-PW001B T_0	RM11E-PWP001B	Frac. Equil.[3]	RM11E-PWW001B	Frac. Equil.[3]	RM11E-PW003A T_0	RM11E-PWP003A	Frac. Equil.[3]	RM11E-PWW003A	Frac. Equil. 3	RM11E-PW006A T_0	RM11E-PWP006A	Frac. Equil.[3]	RM11E-PWW006A	Frac. Equil.[3]
			Units															
PRC Congeners																		
PCBs 20 + 28‡	5.383	3	µg/kg	19900	17800	11%	374	98%	17800	11600	35%	849	95%	17700	15800	11%	1480	92%
PCBs 44 + 47‡ + 65	5.563	4	µg/kg	15200	14100	7%	2120	86%	15800	11000	30%	3130	80%	16200	13400	17%	4720	71%
PCB 54‡	4.923	4	µg/kg	23200 J	11500	50%	74.2 J	100%	14800 J	6810	54%	39.7	100%	15300 J	12400	19%	172	99%
PCBs 86 + 87 + 97‡ + 109 + 119 + 125	6.003	5	µg/kg	18300	17300	5%	5620	69%	20600	12500	39%	6660	68%	20600	16300	21%	8760	57%
PCB 111‡	6.473	5	µg/kg	22900	22100	3%	8610	62%	28900	14500	50%	9950	66%	30200	21000	30%	12000	60%
PCBs 153‡ + 168	6.633	6	µg/kg	20200	22500	-11%	8330	59%	29500	13600	54%	9070	69%	31800	21800	31%	11900	63%
PCB 178‡	6.853	7	µg/kg	17800	18200	-2%	5990	66%	30000	10100	66%	6970	77%	32000	18100	43%	9190	71%

"Low" PRC Load Stations

Analyte	log K_{pew} [1]	# Cl [2]	Station ID	RM11E-PW002					RM11E-PW004					RM11E-PW005					RM11E-PW007		
			Exposure Matrix	Time Zero	Porewater		Surface Water		Time Zero	Porewater		Surface Water		Time Zero	Porewater		Surface Water		Time Zero	Surface Water	
			Sample ID	RM11E-PW002A T_0	RM11E-PWP002A	Frac. Equil.[3]	RM11E-PWW002A	Frac. Equil.[3]	RM11E-PW004B T_0	RM11E-PWP004B	Frac. Equil.[3]	RM11E-PWW004B	Frac. Equil.[3]	RM11E-PW005A T_0	RM11E-PWP005A	Frac. Equil.[3]	RM11E-PWW005A	Frac. Equil.[3]	RM11E-PW007A T_0	RM11E-PWW007	Frac. Equil.[3]
			Units																		
PRC Congeners																					
PCBs 20 + 28‡	5.383	3	µg/kg	717	491	32%	26.8	96%	655	443	32%	5.89	99%	669	466	30%	6.95	99%	618	114 J	82%
PCBs 44 + 47‡ + 65	5.563	4	µg/kg	660	677	-3%	145	78%	536	718	-34%	88.4	84%	607	482	21%	43.9	93%	556	261	53%
PCB 54‡	4.923	4	µg/kg	564 J	361	36%	8.92	98%	782 J	387	51%	6.35	99%	515 J	364	29%	5.57	99%	522 J	17.3	97%
PCBs 86 + 87 + 97‡ + 109 + 119 + 125	6.003	5	µg/kg	890	640	28%	309	65%	621	549	12%	231	63%	834	560	33%	176	79%	729	543	26%
PCB 111‡	6.473	5	µg/kg	1190	622	48%	524	56%	794	529	33%	530	33%	1060	611	42%	401	62%	987	911	8%
PCBs 153‡ + 168	6.633	6	µg/kg	1210	762	37%	797	34%	795	735	8%	943	-19%	1030	802	22%	601	42%	1020	896	12%
PCB 178‡	6.853	7	µg/kg	1210	622	49%	796	34%	759	555	27%	997	-31%	966	733	24%	619	36%	966	879	9%

Notes:

‡ Performance reference compound analyzed at time zero

[1] Kpew = polyethylene:water partitioning coefficient

[2] # Cl = number of chlorine molecules

[3] Fractional Equilibration = 1 - (T_{final} / T_0)

Table 6-5
Comparison of MIT-Reported Performance Reference Compound Results in time-zero and time-final Polyethylene

Analyte	log K_{pew} [1]	# Cl [2]	Station ID	RM11E-PW001					RM11E-PW004				
			Exposure Matrix	Time Zero[5]	T_{final} Porewater		T_{final} Surface Water		Time Zero[5]	T_{final} Porewater		T_{final} Surface Water	
			Sample ID	RM11E-PW001A T_0	RM11E-PWP001A	Fractional Equil. [3]	RM11E-PWW001A	Fractional Equil. [3]	RM11E-PW004A T_0	RM11E-PWP004A	Fractional Equil. [3]	RM11E-PWW004A	Fractional Equil. [3]
			Units										
PRC Congeners [4]													
PCB 28‡ + 31	5.383	3	µg/kg	16,100	8899	45%	758	95%	613	271	56%	7	99%
PCB 47‡ +48 +75	5.563	4	µg/kg	15,100	9367	38%	1602	89%	557	503	10%	64	88%
PCB 54‡	4.923	4	µg/kg	13,500	4741	65%	584	96%	548	230	58%	5	99%
PCB 97‡ + 86 +125	6.003	5	µg/kg	17,700	13550	23%	5310	70%	690	402	42%	203	71%
PCB 111‡	6.473	5	µg/kg	22,600	16545	27%	9872	56%	810	467	42%	367	55%
PCB 153‡ + 132	6.633	6	µg/kg	20,000	15608	22%	9693	52%	776	550	29%	451	42%
PCB 178‡	6.853	7	µg/kg	18,500	12489	32%	7878	57%	732	363	50%	482	34%

Notes:
time zero
[1] Kpew = polyethylene:water partitioning coefficient
[2] # Cl = number of chlorine molecules
[3] Fractional Equilibration = 1 - (T_{final} / T_0)
[4] PRCs listed with co-eluting congeners are shown in bold.
[5] T_0 Data Provided by ALS

Table 6-6
PCB Congener Concentrations in Porewater and Surface Water Estimated from Sediment and Surface Water-Exposed Polyethylene Results Reported by MIT

Analyte	Station ID	RM11E-PW001		RM11E-PW004	
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
	Units				
PCB Congeners					
PCB 1	ng/L	ND	ND	ND	ND
PCB 2	ng/L	ND	ND	ND	ND
PCB 3	ng/L	ND	ND	ND	ND
PCBs 4 + 10	ng/L	2.7399	ND	9.2768	0.6567
PCBs 5 + 8	ng/L	0.2759	ND	0.4733	0.0047
PCB 6	ng/L	0.0546	ND	0.1475	0.0012
PCBs 7 + 9	ng/L	0.0486	ND	0.1026	0.0022
PCB 11	ng/L	ND	ND	ND	0.0126
PCB 12	ng/L	ND	ND	0.6252	ND
PCB 13	ng/L	ND	ND	ND	ND
PCB 14	ng/L	ND	ND	ND	0.0052
PCB 15	ng/L	0.3337	0.0780	0.2113	0.0000
PCBs 16 + 32	ng/L	0.3905	0.0155	1.2350	0.0220
PCB 17	ng/L	0.5016	0.0412	2.2303	0.0321
PCB 18	ng/L	0.3061	ND	0.4526	0.0110
PCB 19	ng/L	4.1953	0.0878	10.3085	0.0243
PCBs 20+21+33	ng/L	0.3729	ND	0.1645	ND
PCB 22	ng/L	ND	ND	0.0167	ND
PCBs 23 + 34	ng/L	ND	ND	ND	ND
PCBs 24+27	ng/L	0.2531	ND	0.4875	0.0042
PCBs 25+26	ng/L	0.4032	0.2092	0.0625	0.0018
PCBs 28[‡]+31	ng/L	NE	NE	NE	NE
PCB 29	ng/L	ND	ND	0.0858	ND
PCB 30	ng/L	0.2940	0.0147	0.0229	ND
PCB 35	ng/L	ND	ND	ND	ND
PCB 36	ng/L	0.0100	ND	ND	0.0022
PCB 37	ng/L	0.0391	ND	0.0098	0.0000
PCB 38	ng/L	ND	ND	0.1801	0.0167
PCB 40	ng/L	0.0390	ND	0.0239	0.0004
PCBs 41+64+68	ng/L	0.0428	0.0067	0.0334	0.0055
PCB 42	ng/L	0.1045	0.0129	0.0559	0.0027
PCB 43	ng/L	ND	ND	ND	ND
PCB 44	ng/L	0.1665	0.0207	0.1335	0.0109
PCB 45	ng/L	0.0221	ND	0.0260	ND
PCB 46	ng/L	0.0589	ND	0.1213	0.0010
PCBs 47[‡]+48+75	ng/L	NE	NE	NE	NE
PCB 49	ng/L	1.1364	0.0884	0.8453	0.0674
PCB 50	ng/L	0.0864	0.0062	0.0975	0.0049
PCB 51	ng/L	0.5959	0.0428	1.4394	0.0279
PCB 52	ng/L	0.7028	ND	0.7973	0.0596
PCB 53	ng/L	1.1947	0.0389	1.6347	0.0963
PCB 54[‡]	ng/L	NE	NE	NE	NE
PCBs 56+60	ng/L	0.1243	0.0133	0.0149	0.0011
PCB 57	ng/L	0.0484	0.0089	0.0019	0.0003
PCB 58	ng/L	0.0088	0.0024	ND	ND
PCB 59	ng/L	ND	ND	0.1921	0.0000
PCB 61	ng/L	ND	ND	0.2249	0.0000
PCB 62	ng/L	ND	ND	0.1702	0.0000
PCB 63	ng/L	ND	ND	0.2723	0.4767
PCB 65	ng/L	ND	ND	ND	ND
PCBs 66+80	ng/L	0.0276	0.0084	0.0188	0.0042
PCB 67	ng/L	0.0241	0.0039	0.0012	0.0003
PCB 69	ng/L	0.0361	0.0034	0.0344	0.0036
PCB 70	ng/L	0.0845	0.0083	0.0872	0.0053
PCBs 71+72	ng/L	0.0380	ND	ND	0.0015
PCB 73	ng/L	0.0380	ND	ND	0.0015
PCB 74	ng/L	0.0094	ND	0.0083	0.0016
PCB 76	ng/L	ND	ND	0.0015	ND
PCB 77	ng/L	ND	ND	0.0008	0.0002
PCB 78	ng/L	ND	ND	ND	ND
PCB 79	ng/L	ND	ND	ND	ND
PCBs 81+148	ng/L	ND	ND	0.0009	0.0014
PCB 82	ng/L	0.0347	ND	0.0204	0.0014
PCBs 83+109	ng/L	0.0067	ND	0.0031	0.0009
PCB 84	ng/L	0.0588	0.0062	0.0566	0.0010
PCBs 85+120	ng/L	ND	ND	0.0031	0.0016
PCBs 86+97[‡]+125	ng/L	NE	NE	NE	NE
PCBs 87+115	ng/L	ND	ND	ND	ND
PCB 88	ng/L	ND	ND	0.0776	ND
PCBs 89+90+101	ng/L	0.5106	0.0436	0.3778	0.0424
PCB 91	ng/L	0.1666	0.0125	0.1733	0.0091
PCB 92	ng/L	0.0548	0.0061	0.0538	0.0112
PCB 93	ng/L	ND	ND	ND	ND
PCB 94	ng/L	0.0280	ND	0.0375	0.0014
PCBs 95+121	ng/L	0.2051	0.0139	0.2662	0.0865
PCB 96	ng/L	0.2464	0.0099	0.1066	0.0019
PCBs 98+102	ng/L	0.0444	0.0037	0.0377	0.0018
PCB 99	ng/L	0.1024	0.0145	0.0542	0.0117
PCB 100	ng/L	0.0544	0.0071	0.0836	0.0089

Table 6-6
PCB Congener Concentrations in Porewater and Surface Water Estimated from Sediment and Surface Water-Exposed Polyethylene Results Reported by MIT

Analyte	Station ID	RM11E-PW001		RM11E-PW004	
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
	Units				
PCB 103	ng/L	0.0544	0.0071	0.0836	0.0089
PCB 105	ng/L	0.0138	ND	0.0048	0.0009
PCBs 106+118	ng/L	0.0788	0.0078	0.0225	0.0039
PCBs 107+108+123	ng/L	0.0212	0.0020	0.0088	0.0019
PCB 110	ng/L	0.2060	0.0108	0.1178	0.0083
PCBs 111‡+116+117	ng/L	NE	NE	NE	NE
PCB 112	ng/L	ND	ND	ND	ND
PCB 113	ng/L	ND	ND	ND	ND
PCB 114	ng/L	ND	ND	ND	ND
PCB 119	ng/L	0.0162	0.0018	0.0128	0.0016
PCB 122	ng/L	0.0134	0.0058	0.0046	0.0049
PCB 124	ng/L	ND	0.0011	0.0006	ND
PCB 126	ng/L	0.0230	0.0041	ND	ND
PCB 127	ng/L	ND	ND	ND	ND
PCB 128	ng/L	0.0214	0.0009	0.0076	0.0009
PCB 129	ng/L	ND	ND	0.0306	0.0240
PCB 130	ng/L	0.0100	ND	0.0034	0.0008
PCB 131	ng/L	ND	ND	0.0013	ND
PCBs 132+153‡	ng/L	NE	NE	NE	NE
PCBs 133+165	ng/L	0.0118	0.0012	0.0006	0.0003
PCBs 134+143	ng/L	0.0236	0.0021	0.0116	0.0010
PCB 135	ng/L	0.1056	0.0114	0.0353	0.0105
PCB 136	ng/L	0.1445	0.0090	0.1281	0.0026
PCB 137	ng/L	ND	ND	0.0009	0.0002
PCBs 138+160	ng/L	0.1616	0.0048	0.0532	0.0090
PCBs 139+149	ng/L	0.3853	0.0149	0.1946	0.0171
PCB 141	ng/L	0.0760	0.0031	0.0305	0.0057
PCB 142	ng/L	0.0776	0.0168	0.0062	0.0010
PCB 144	ng/L	0.0281	0.0009	0.0118	0.0029
PCB 145	ng/L	ND	ND	ND	ND
PCBs 146+161	ng/L	0.0399	0.0031	0.0121	0.0039
PCB 147	ng/L	0.0165	0.0014	0.0163	0.0015
PCB 148	ng/L	ND	ND	0.0019	0.0005
PCB 151	ng/L	0.1661	0.0082	0.0827	0.0209
PCB 152	ng/L	ND	ND	0.0046	0.0002
PCB 154	ng/L	0.0060	ND	0.0042	0.0014
PCB 155	ng/L	ND	ND	0.0008	0.00004
PCB 156	ng/L	0.0090	ND	0.0023	0.0003
PCB 157	ng/L	ND	ND	ND	ND
PCB 158	ng/L	0.0200	ND	0.0056	0.0004
PCB 159	ng/L	ND	ND	ND	ND
PCB 162	ng/L	ND	ND	ND	ND
PCBs 163+164	ng/L	0.1163	0.0016	0.0305	0.0042
PCB 166	ng/L	ND	ND	ND	ND
PCB 167	ng/L	0.0042	ND	0.0008	0.0002
PCB 168	ng/L	0.0634	ND	0.0193	ND
PCB 169	ng/L	ND	ND	ND	ND
PCBs 170+190	ng/L	0.0232	0.0009	0.0057	0.0018
PCB 171	ng/L	0.0142	ND	0.0037	0.0002
PCBs 172+192	ng/L	0.0058	ND	0.0011	0.0005
PCB 173	ng/L	ND	ND	0.0005	ND
PCBs 174+181	ng/L	0.0565	0.0017	0.0159	0.0015
PCB 175	ng/L	0.0476	0.0050	0.0011	0.0015
PCB 176	ng/L	0.0114	ND	0.0052	0.0002
PCB 177	ng/L	0.0328	0.0012	0.0099	0.0010
PCB 178‡	ng/L	NE	NE	NE	NE
PCB 179	ng/L	0.0419	0.0019	0.0194	0.0004
PCBs 180+193	ng/L	0.0638	0.0013	0.0151	0.0037
PCBs 182+187	ng/L	0.0728	0.0022	0.0187	0.0023
PCB 183	ng/L	0.0279	0.0011	0.0075	0.0021
PCB 184	ng/L	ND	ND	0.0001	0.0001
PCB 185	ng/L	0.0089	ND	0.0022	0.0008
PCB 186	ng/L	ND	ND	0.0001	ND
PCB 189	ng/L	ND	ND	0.0003	ND
PCB 191	ng/L	ND	ND	0.0003	ND
PCB 194	ng/L	0.0054	ND	0.0012	0.0004
PCB 195	ng/L	0.0041	ND	0.0007	0.0001
PCBs 196+203	ng/L	0.0088	0.0004	0.0020	0.0006
PCB 197	ng/L	ND	ND	0.0002	ND
PCB 198	ng/L	0.0057	0.0004	0.0001	ND
PCB 199	ng/L	0.0098	0.0007	0.0033	0.0004
PCB 200	ng/L	ND	ND	0.0004	ND
PCB 201	ng/L	0.0020	ND	0.0003	ND
PCB 202	ng/L	ND	ND	0.0000	ND
PCB 204	ng/L	ND	ND	0.00013	ND
PCB 205	ng/L	ND	ND	0.0001	ND
PCB 206	ng/L	ND	ND	0.0001	ND
PCB 207	ng/L	ND	ND	0.00003	ND
PCB 208	ng/L	ND	ND	0.00003	ND

Table 6-6
PCB Congener Concentrations in Porewater and Surface Water Estimated from Sediment and Surface Water-Exposed Polyethylene Results Reported by MIT

Analyte	Station ID	RM11E-PW001		RM11E-PW004	
	Exposure Matrix	Porewater	Surface Water	Porewater	Surface Water
	Sample ID	RM11E-PWP001A	RM11E-PWW001A	RM11E-PWP004A	RM11E-PWW004A
	Units				
PCB 209	ng/L	ND	ND	ND	ND
Total PCBs (RI Calc)[1]	ng/L	18.7	0.97	34.7	1.9

Notes:

‡ Performance reference compound analyzed at time zero

-- = Not Analyzed

MIT = Massachusetts Institute of Technology

ND = Not Detected above method detection limits (MDLs).

NE = Not Estimated

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

Calculations made and reported on detected PCB congeners only. Estimates are rounded to four decimal places, except for those cases where the estimated values were at sub-picogram levels (e.g., PCBs 155, 206), in which case values are rounded to five decimal places.

[1] Performance reference compounds excluded from RI calculation sum.

Table 6-7
PCB Congener Concentrations in Surface Water Estimated from Surface Water-Exposed Polyethylene Reported by ALS

Analyte	Station ID	RM11E-PW001	RM11E-PW002	RM11E-PW003	RM11E-PW004	RM11E-PW005	RM11E-PW006	RM11E-PW007
	Sample ID	RM11E-PWW001B	RM11E-PWW002A	RM11E-PWW003A	RM11E-PWW004B	RM11E-PWW005A	RM11E-PWW006A	RM11E-PWW007
	Units							
PCB Congeners								
PCB 1	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 2	ng/L	ND	ND	ND	ND	ND	ND	0.0005
PCB 3	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 4	ng/L	ND	0.0642	ND	0.0915	0.0213	ND	ND
PCB 5	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 6	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 7	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 8	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 9	ng/L	ND	ND	ND	ND	ND	ND	0.0003
PCB 10	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 11	ng/L	ND	0.0093	ND	0.0071	0.0073	ND	0.0063
PCBs 12 + 13	ng/L	ND	ND	ND	ND	ND	ND	0.0005
PCB 14	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 15	ng/L	ND	ND	ND	0.0038	ND	ND	ND
PCB 16	ng/L	ND	ND	ND	ND	ND	ND	0.0005
PCB 17	ng/L	ND	0.0245	ND	0.0498	0.0099	ND	ND
PCB 18	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 19	ng/L	ND	0.0993	ND	0.1576	ND	0.9199	ND
PCBs 20 + 28[‡]	ng/L	NE	NE	NE	NE	NE	NE	NE
PCBs 21 + 33	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 22	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 23	ng/L	ND	ND	ND	ND	ND	ND	0.0003
PCB 24	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 25	ng/L	ND	ND	ND	ND	ND	ND	0.0009
PCBs 26 + 29	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 27	ng/L	ND	0.0057	ND	0.0098	ND	ND	ND
PCB 30	ng/L	ND	0.0061	ND	0.0066	ND	ND	ND
PCB 31	ng/L	ND	0.0038	ND	ND	ND	ND	0.0014
PCB 32	ng/L	ND	0.0104	ND	0.0151	0.0051	ND	ND
PCB 34	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 35	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 36	ng/L	ND	ND	ND	ND	ND	ND	0.0002
PCB 37	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 38	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 39	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 40 + 71	ng/L	ND	0.0138	ND	0.0128	0.0028	ND	ND
PCB 41	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 42	ng/L	ND	0.0027	ND	0.0041	0.0013	ND	ND

Table 6-7
PCB Congener Concentrations in Surface Water Estimated from Surface Water-Exposed Polyethylene Reported by ALS

Analyte	Station ID	RM11E-PW001	RM11E-PW002	RM11E-PW003	RM11E-PW004	RM11E-PW005	RM11E-PW006	RM11E-PW007
	Sample ID	RM11E-PWW001B	RM11E-PWW002A	RM11E-PWW003A	RM11E-PWW004B	RM11E-PWW005A	RM11E-PWW006A	RM11E-PWW007
	Units							
PCBs 43 + 73	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 44 + 47‡ + 65	ng/L	NE	NE	NE	NE	NE	NE	NE
PCBs 45 + 51	ng/L	0.2039	0.0851	0.0556	0.0977	0.0190	0.4551	ND
PCB 46	ng/L	ND	ND	ND	0.0051	ND	ND	0.0002
PCB 48	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 49	ng/L	0.1190	0.0760	0.0810	0.0861	0.0178	0.4264	0.0209
PCBs 50 + 53	ng/L	0.1350	0.0635	ND	0.0802	0.0166	0.2356	ND
PCB 52	ng/L	ND	0.0740	ND	0.0927	0.0200	0.2443	ND
PCB 54‡	ng/L	NE	NE	NE	NE	NE	NE	NE
PCB 55	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 56	ng/L	ND	0.0017	ND	0.0010	0.0007	ND	0.0024
PCB 57	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 58	ng/L	ND	0.0020	ND	0.0025	0.0003	ND	ND
PCBs 59 + 62 + 75	ng/L	0.0672	0.0061	ND	0.0061	0.0008	0.0847	0.0001
PCB 60	ng/L	ND	ND	ND	ND	ND	ND	0.0003
PCB 61	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 63	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 64	ng/L	ND	0.0021	ND	0.0020	0.0009	ND	ND
PCB 66	ng/L	ND	0.0051	ND	0.0062	0.0025	ND	ND
PCB 67	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 68	ng/L	ND	0.0008	ND	ND	ND	ND	ND
PCB 69	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 70 + 74 + 76	ng/L	ND	0.0070	ND	0.0096	0.0038	ND	0.0037
PCB 72	ng/L	ND	ND	ND	ND	ND	ND	0.0001
PCB 77	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 78	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 79	ng/L	0.1456	0.0081	0.1802	0.0109	0.0037	0.2708	0.0447
PCB 80	ng/L	ND	ND	ND	0.0004	0.0001	ND	0.0001
PCB 81	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 82	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 83 + 99	ng/L	ND	0.0151	ND	0.0227	0.0053	0.0520	ND
PCB 84	ng/L	ND	0.0080	ND	0.0074	0.0021	ND	0.0025
PCB 85	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 86 + 87 + 97‡ + 109 + 119 +125	ng/L	NE	NE	NE	NE	NE	NE	NE
PCB 88	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 89	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 90 + 101 + 113	ng/L	0.0356	0.0502	ND	0.0640	0.0157	0.0861	ND
PCB 91	ng/L	ND	0.0225	ND	0.0304	0.0059	ND	ND
PCB 92	ng/L	ND	0.0101	ND	0.0130	ND	ND	ND

Table 6-7
PCB Congener Concentrations in Surface Water Estimated from Surface Water-Exposed Polyethylene Reported by ALS

Analyte	Station ID	RM11E-PW001	RM11E-PW002	RM11E-PW003	RM11E-PW004	RM11E-PW005	RM11E-PW006	RM11E-PW007
	Sample ID	RM11E-PWW001B	RM11E-PWW002A	RM11E-PWW003A	RM11E-PWW004B	RM11E-PWW005A	RM11E-PWW006A	RM11E-PWW007
	Units							
PCB 93	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 94	ng/L	ND	0.0045	ND	0.0055	0.0012	ND	ND
PCBs 95 + 100	ng/L	0.0843	0.0743	0.0331	0.0908	0.0208	0.1547	0.0134
PCB 96	ng/L	ND	0.0081	ND	0.0082	0.0015	ND	0.0013
PCBs 98 + 102	ng/L	ND	0.0042	ND	0.0050	0.0013	ND	ND
PCB 103	ng/L	ND	0.0073	ND	0.0119	0.0022	ND	ND
PCB 104	ng/L	ND	0.0035	ND	0.0043	ND	ND	0.0010
PCB 105	ng/L	ND	0.0016	ND	0.0040	0.0009	ND	0.0026
PCB 106	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 107	ng/L	ND	ND	ND	ND	ND	ND	0.0017
PCBs 108 + 124	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 110 + 115	ng/L	ND	0.0160	ND	0.0232	0.0058	0.0296	ND
PCB 111[‡]	ng/L	NE	NE	NE	NE	NE	NE	NE
PCB 112	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 114	ng/L	ND	ND	ND	ND	ND	ND	0.0003
PCBs 117 + 116	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 118	ng/L	ND	0.0066	ND	0.0177	0.0031	ND	ND
PCB 120	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 121	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 122	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 123	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 126	ng/L	ND	ND	ND	ND	ND	ND	0.0016
PCB 127	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 128	ng/L	ND	0.0015	ND	ND	ND	ND	0.0005
PCBs 129 + 138 + 163	ng/L	0.0212	0.0352	0.0176	0.2450	0.0113	0.0699	ND
PCB 130	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 131	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 132	ng/L	ND	0.0129	ND	0.0205	0.0043	0.0357	ND
PCB 133	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 134	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 135 + 154	ng/L	ND	0.0059	0.0053	0.0165	0.0018	0.0183	0.0066
PCB 136	ng/L	ND	0.0230	ND	0.0265	0.0068	0.0573	0.0043
PCB 137	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 139 + 140	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 141	ng/L	ND	0.0086	0.0065	0.0384	0.0030	ND	ND
PCB 142	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 143	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 144	ng/L	ND	0.0034	ND	0.0055	0.0009	ND	0.0017
PCB 145	ng/L	ND	ND	ND	ND	ND	ND	ND

Table 6-7
PCB Congener Concentrations in Surface Water Estimated from Surface Water-Exposed Polyethylene Reported by ALS

Analyte	Station ID	RM11E-PW001	RM11E-PW002	RM11E-PW003	RM11E-PW004	RM11E-PW005	RM11E-PW006	RM11E-PW007
	Sample ID	RM11E-PWW001B	RM11E-PWW002A	RM11E-PWW003A	RM11E-PWW004B	RM11E-PWW005A	RM11E-PWW006A	RM11E-PWW007
	Units							
PCB 146	ng/L	ND	0.0053	ND	0.0707	0.0013	ND	ND
PCBs 147 + 149	ng/L	0.0302	0.0488	0.0197	0.0976	0.0141	0.1068	ND
PCB 148	ng/L	ND	ND	ND	0.0010	ND	ND	ND
PCB 150	ng/L	ND	0.0010	ND	0.0022	0.0003	ND	ND
PCB 151	ng/L	0.0148	0.0270	0.0149	0.0486	0.0080	0.0627	0.0138
PCB 152	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 153[+] + 168	ng/L	NE	NE	NE	NE	NE	NE	NE
PCB 155	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 156 + 157	ng/L	ND	0.0010	ND	0.0214	0.0005	ND	ND
PCB 158	ng/L	0.0801	0.0131	0.0769	0.6158	0.0087	0.1003	0.5049
PCB 159	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 160	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 161	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 162	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 164	ng/L	ND	0.0015	ND	ND	0.0006	ND	ND
PCB 165	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 166	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 167	ng/L	ND	0.0004	ND	0.0055	ND	ND	ND
PCB 169	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 170	ng/L	ND	0.0038	ND	0.0879	0.0023	0.0126	ND
PCBs 171 + 173	ng/L	ND	0.0015	ND	0.0418	0.0007	ND	ND
PCB 172	ng/L	ND	0.0007	ND	0.0120	0.0003	ND	ND
PCB 174	ng/L	ND	0.0070	ND	0.1395	0.0028	0.0128	ND
PCB 175	ng/L	ND	0.0005	ND	0.0244	ND	ND	ND
PCB 176	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 177	ng/L	ND	0.0045	ND	0.1050	0.0014	0.0088	ND
PCB 178[‡]	ng/L	NE	NE	NE	NE	NE	NE	NE
PCB 179	ng/L	0.0092	0.0063	ND	0.0150	0.0016	ND	ND
PCBs 180 + 193	ng/L	0.0047	0.0073	0.0019	0.1051	0.0033	0.0095	ND
PCB 181	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 182	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 183	ng/L	ND	0.0037	ND	0.0667	0.0012	0.0046	ND
PCB 184	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 185	ng/L	ND	0.0008	ND	0.0200	0.0003	ND	0.0044
PCB 186	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 187	ng/L	0.0048	0.0075	ND	0.1519	0.0025	0.0119	ND
PCB 188	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 189	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 190	ng/L	ND	0.0009	ND	0.0129	0.0004	ND	ND

Table 6-7
PCB Congener Concentrations in Surface Water Estimated from Surface Water-Exposed Polyethylene Reported by ALS

Analyte	Station ID	RM11E-PW001	RM11E-PW002	RM11E-PW003	RM11E-PW004	RM11E-PW005	RM11E-PW006	RM11E-PW007
	Sample ID	RM11E-PWW001B	RM11E-PWW002A	RM11E-PWW003A	RM11E-PWW004B	RM11E-PWW005A	RM11E-PWW006A	RM11E-PWW007
	Units							
PCB 191	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 192	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 194	ng/L	ND	0.0008	ND	0.0065	0.0069	0.0015	ND
PCB 195	ng/L	ND	0.0005	ND	0.0049	0.0003	ND	ND
PCB 196	ng/L	ND	0.0005	ND	0.0076	0.0003	ND	ND
PCB 197	ng/L	ND	ND	ND	ND	ND	ND	ND
PCBs 198 + 199	ng/L	ND	0.0011	ND	0.0221	0.0006	ND	0.0099
PCB 200	ng/L	ND	0.0001	ND	ND	ND	ND	ND
PCB 201	ng/L	ND	0.0002	ND	ND	ND	ND	ND
PCB 202	ng/L	ND	0.0003	ND	0.0089	0.0001	ND	0.0042
PCB 203	ng/L	ND	0.0006	ND	0.0067	ND	ND	ND
PCB 204	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 205	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 206	ng/L	ND	ND	ND	0.0011	ND	ND	ND
PCB 207	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 208	ng/L	ND	ND	ND	ND	ND	ND	ND
PCB 209	ng/L	ND	0.0009	ND	0.0016	0.0021	ND	ND
Total PCBs (RI Calc)[1]	ng/L	0.96	1.04	0.49	3.12	0.29	3.47	0.66

Notes:

‡ performance reference compound analyzed at time zero

ALS = ALS Environmental Laboratory

ND = Not Detected above method detection limits (MDLs).

NE = Not Estimated

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

Calculations made and reported on detected PCB congeners only. Estimates are rounded to four decimal places, except for those cases where the estimated values were at sub-picogram levels (e.g., PCBs 155, 206), in which case values are rounded to five decimal places.

[1] Performance reference compounds excluded from RI calculation sum.

Table 7-1
Parameters for the One-Carbon and Two-Carbon Partitioning Models

Parameters	Derivation	Data Source/Reference
C_{sed} = Concentration in sediment	ALS - Aroclors and PCB Congeners MIT - PCB Congeners only	ALS - Table 5-1 MIT - Table 5-3
Aroclors (1232, 1248, 1254, and 1260)	RI Calculation: Sum of detected Aroclors only	
	FS Calculation: Sum of detected Aroclors + 1/2 MDL for non-detects	
PCB Congeners (1 - 209)	ALS - Sum of detected Congeners only	
	MIT - Sum of detected Congeners only	
f_{toc} = fraction total organic carbon	Measured Value	
f_{bc} = fraction black carbon	Measured Value	
f_{oc} = fraction organic carbon	f_{toc} - f_{bc}	Gschwend et al 2013
K_{oc} = sediment-water partitioning coefficient	Aroclors - Log (10^{Kow}*0.35)	Gschwend et al 2013
	Congeners - Published values	Hansen et al, 1999
K_{ow} = Octanol-water Partitioning Coefficient	Aroclors - Published values	ATSDR, 2000
	Congeners - Published values	Hawker D.W. and D.W. Connell, 2008

Table 7-2
Comparison of Total PCB Porewater Concentrations Calculated by the One-Carbon and Two-Carbon Partitioning Models and those Estimated from Sediment-Exposed Polyethylene

	Units	STATION	
		RM11E-PW001	RM11E-PW004
Measured Sediment Concentrations			
ALS Sediment Total PCB Aroclors RI Calc	µg/kg	82 JT	1600 T
ALS Sediment Total PCB Aroclors FS Calc	µg/kg	101 JT	2190 T
ALS Sediment Total PCB Congeners RI Calc	µg/kg	311 JT	1180 JT
MIT Sediment Total PCB Congeners RI Calc	µg/kg	256	1271
Porewater Concentrations Calculated from Measured Sediment Concentrations			
ALS Porewater from Total PCB Aroclors RI Calc (One-Carbon)[1]	ng/L	10	58
ALS Porewater from Total PCB Aroclors FS Calc (One-Carbon)[2]	ng/L	19	169
ALS Porewater from Total PCB Aroclors RI Calc (Two-Carbon)[3]	ng/L	1.6	38.8
ALS Porewater from Total PCB Aroclors FS Calc (Two-Carbon)[4]	ng/L	2.9	115
ALS Porewater from Individual PCB Congeners RI Calc (One-Carbon)[5]	ng/L	217	746
ALS Porewater from Individual PCB Congeners RI Calc (Two-Carbon)[6]	ng/L	35	307
MIT Porewater from Individual PCB Congeners RI Calc (One-Carbon)[5]	ng/L	138	838
MIT Porewater from Individual PCB Congeners RI Calc (Two-Carbon)[6]	ng/L	41	151
Porewater Concentrations Estimated from Sediment-Exposed Polyethylene (PE) PCB Results			
Estimated Porewater Concentrations from MIT Sediment-Exposed PE[7]	ng/L	19	35

Notes:

One-Carbon = One-Carbon Partitioning Model (which is the same as the Equilibrium Partitioning Model)

Two-Carbon = Two-Carbon Partitioning Model

[1]Using the sum of the detected Total PCB Aroclors, calculates the porewater concentration using the one-carbon equilibrium partitioning model.

[2]Using the sum of the detected Total PCB Aroclors, and 1/2 the RL for 1232 through 1260, calculates the porewater concentration using the one-carbon equilibrium partitioning

[3]Using the sum of the detected Total PCB Aroclors, calculates the porewater concentration using the two-carbon partitioning model.

[4]Using the sum of the detected Total PCB Aroclors, and 1/2 the RL for 1232 through 1260, calculates the porewater concentration using the two-carbon partitioning model.

[5]For each detected congener, calculates the porewater concentration using the one-carbon partitioning model, and then sums the total for all congeners.

[6]For each detected congener, calculates the porewater concentration using the two-carbon partitioning model, and then sums the total for all congeners.

[7]Porewater concentrations estimated from sediment-exposed PE results reported by MIT.

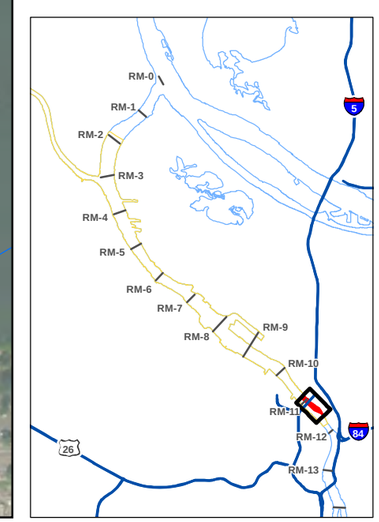
FIGURE 1-1
Project Area Map

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

LEGEND

- RM11E Project Area (dashed line indicates inferred top of bank)
- Shoreline Properties
- U.S. Army Corps of Engineers Navigation Channel
- River Mile (RM) Tenths



MAP NOTES:
Date: April 16, 2015
RM = River Mile
1. The locations of all features shown are approximate.
2. RM11E Project Area includes AOPC 25 and the adjacent riverbank area to the top of bank.
3. Air photo taken fall 2013 by METRO.
4. The river mile (RM) designations are based on USACE stationing along the centerline of the Lower Willamette River navigation channel and represent the distance in miles from the start of channel at the Columbia River (USACE Portland District Hydrosurvey file WR_2014_Channel.DXF).

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Feet

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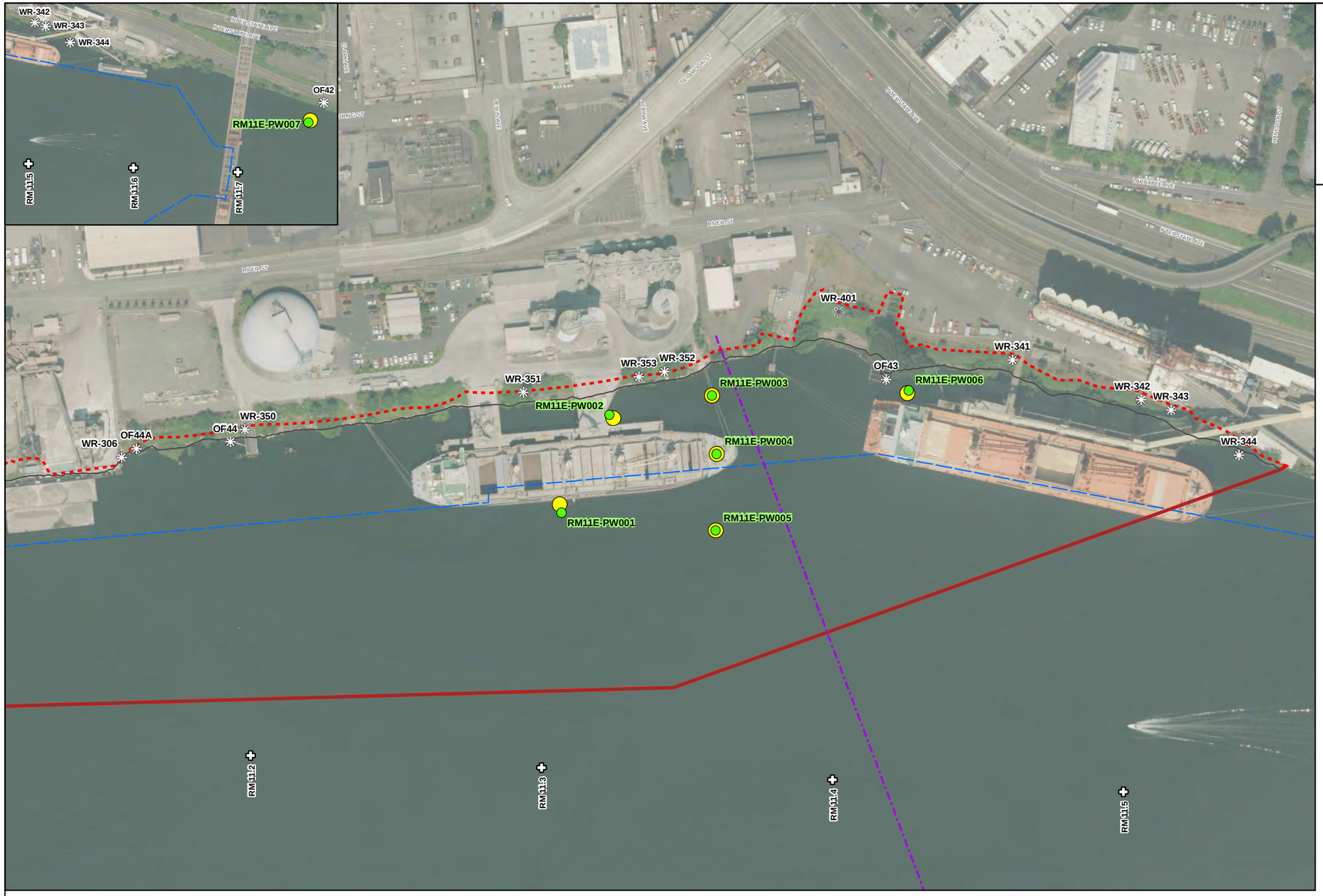
FIGURE 2-1
Proposed and Actual Sampling Locations

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

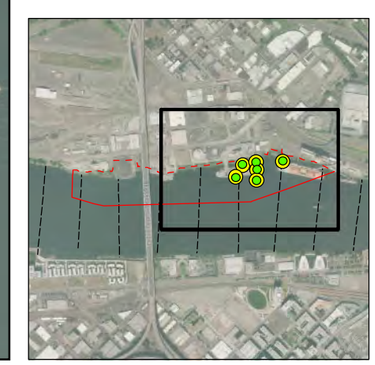


LEGEND

- Actual Sample Location
- Proposed Sample Location

All Other Features

- RM11E Project Area (dashed line indicates inferred top of bank)
- AOPC 25[4]
- U.S. Army Corps of Engineers Navigation Channel
- Cable Crossing (approximate)
- Active Outfall
- Inactive Outfall
- River Mile (RM) Tenths



MAP NOTES:

Date: May 20, 2015
AOPC = Area of Potential Concern
FS = Feasibility Study
RM = River Mile
1. The locations of all features shown are approximate.
2. Aerial photo base taken in fall 2013 by METRO.
3. RM11E Project Area includes AOPC 25 and the adjacent riverbank area to the top of bank.
4. The AOPC 25 boundary is consistent with the information presented in the Draft FS report for the Portland Harbor (Anchor QEA et al., 2012).
5. The river mile (RM) designations are based on USACE stationing along the centerline of the Lower Willamette River navigation channel and represent the distance in miles from the start of channel at the Columbia River (USACE Portland District Hydrosurvey file WR_2014_Channel.DXF).

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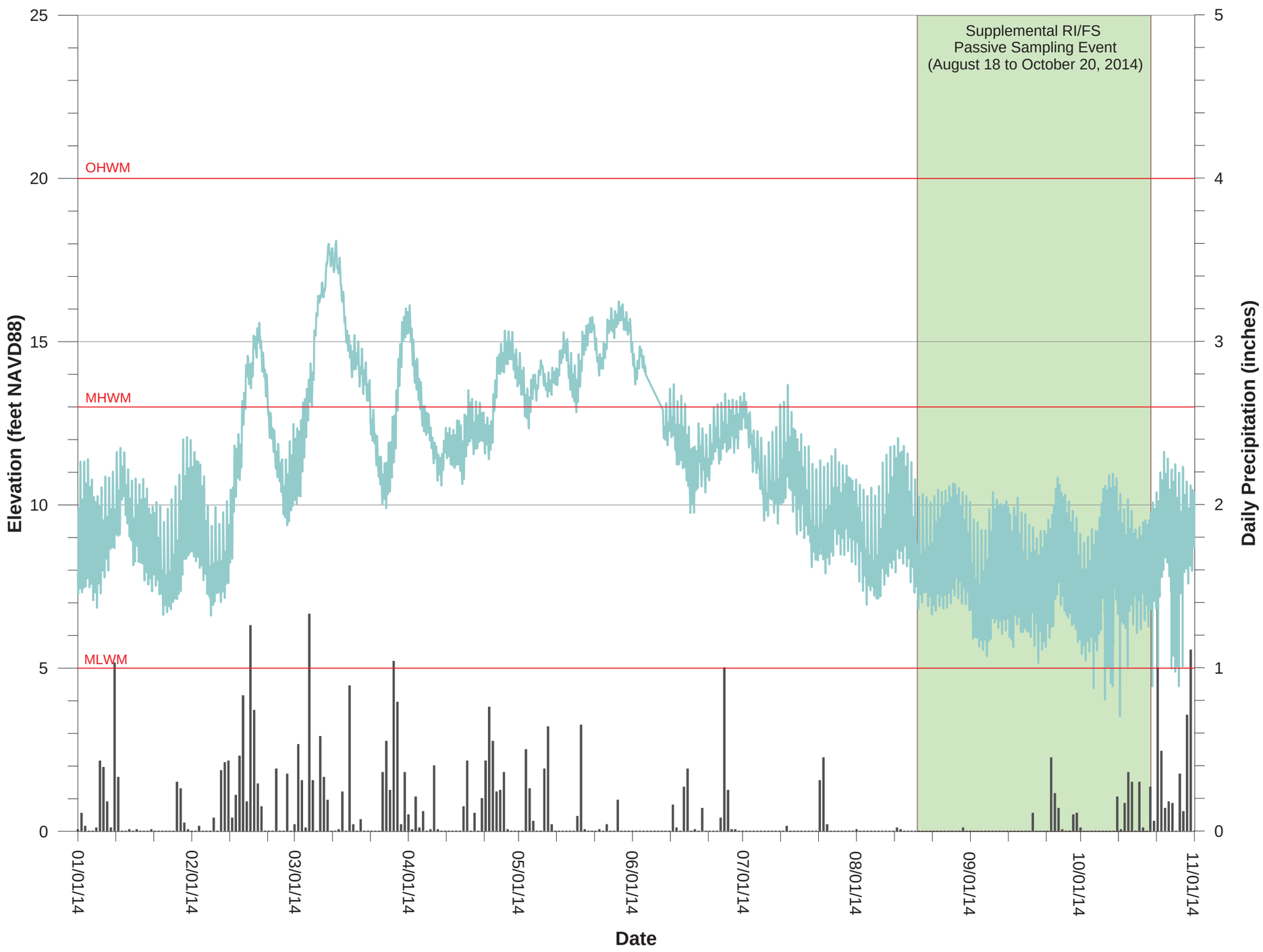

FIGURE 2-2
Willamette River Stage Relative to Passive Sampler Deployment and Retrival

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland Oregon

Legend

- Willamette River Elevation
- Precipitation Data
- Portland Harbor Water Level Datums
- Supplemental RI/FS Passive Porewater Sampling Event (August 18 to October 20, 2014)

Notes:
OHWM = Ordinary High Water Mark, refers to upper edge of the riverbank and defines the elevation beyond which inundation by the river is limited to extreme flow events, which occur approximately every 5 years.

MHWM = Mean High Water Mark, refers to the elevation defining the shoreline boundary of the Portland Harbor Superfund Site and is based on DEQ memorandum dated July 9, 2003 to EPA regarding the upland/in-water boundary for the Superfund Site (DEQ 2003b).

MLWM = Mean Low Water Mark, refers to the average approximate average low water height.

River stage data were recorded on a 30-minute basis from USGS station number 14211720. Station is located on the upstream side of the Morrison Bridge (RM 12.8). River stage elevation data reported by the USGS are corrected to NAVD88 at the Site by adding 5.05 feet to the USGS reading.

Precipitation data were obtained from the Astor Elementary School rain gage located approximately 4 miles from the Site. Daily totals were obtained from the City of Portland Hydra Network available on the USGS Web site.

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May 2015

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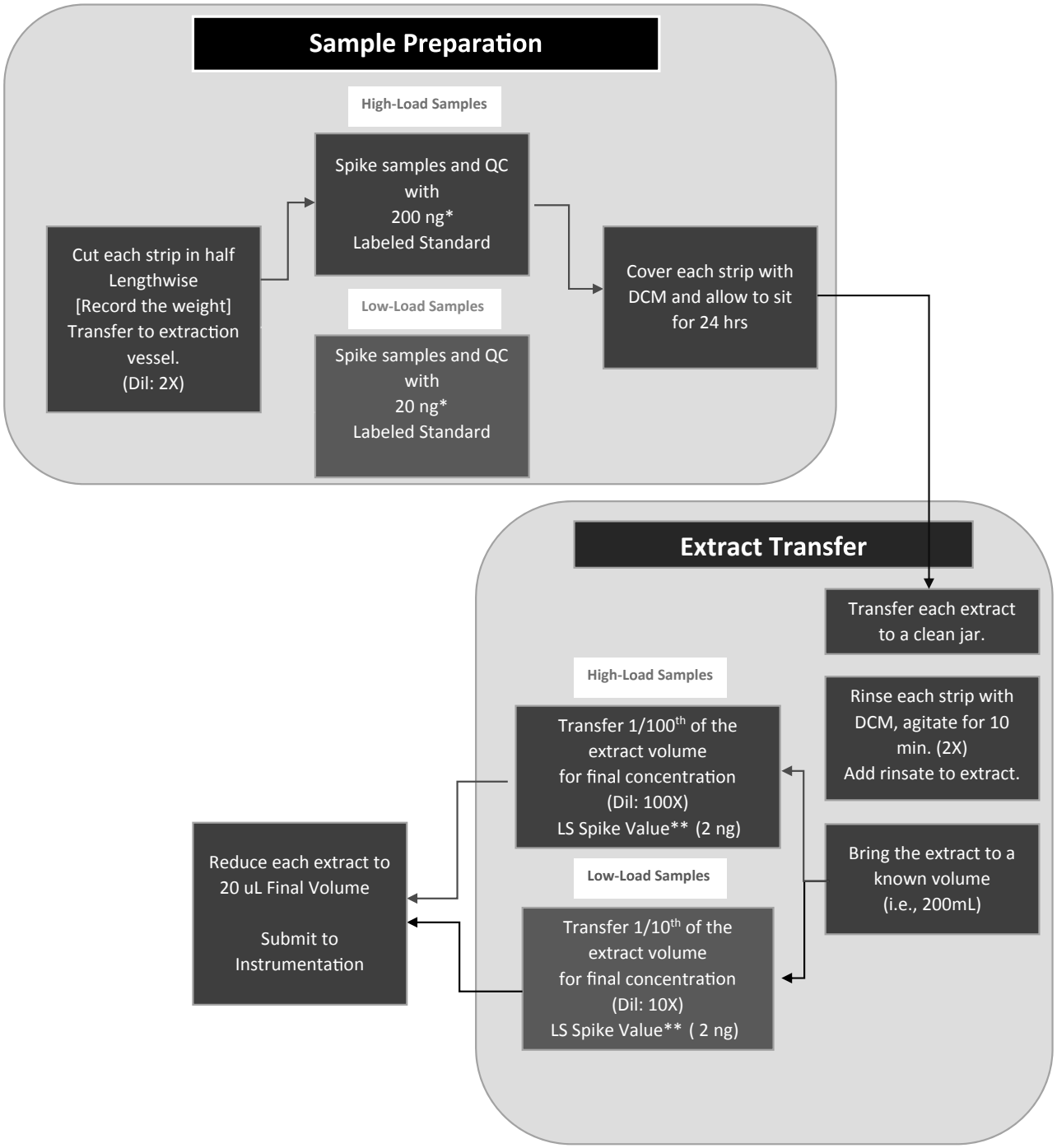

NOTES:

High-Load Sample Dilution: 200X
Low-Load Sample Dilution: 20X

*Labeled standard concentration is presented in mass of each C13 Labeled Congener added to sample.
** LS Spike Value is presented in mass of each C13 Labeled congener present in final extract.

FIGURE 3-1

Sample Preparation Flow Chart

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

Source: Prepared for the project and provided by ALS Environmental

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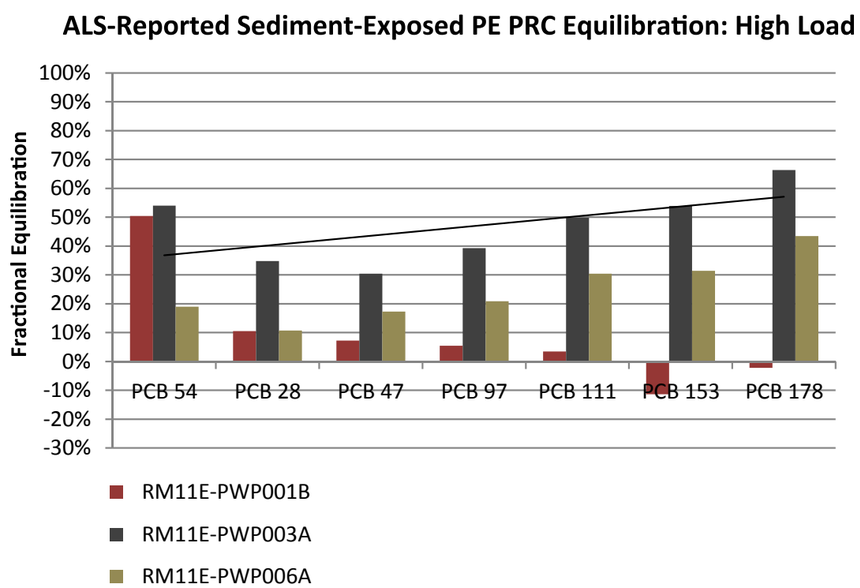

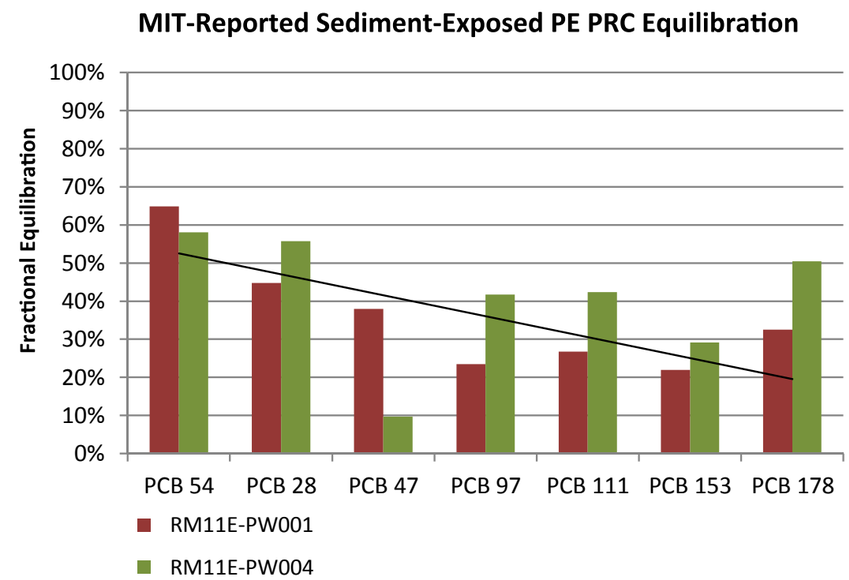

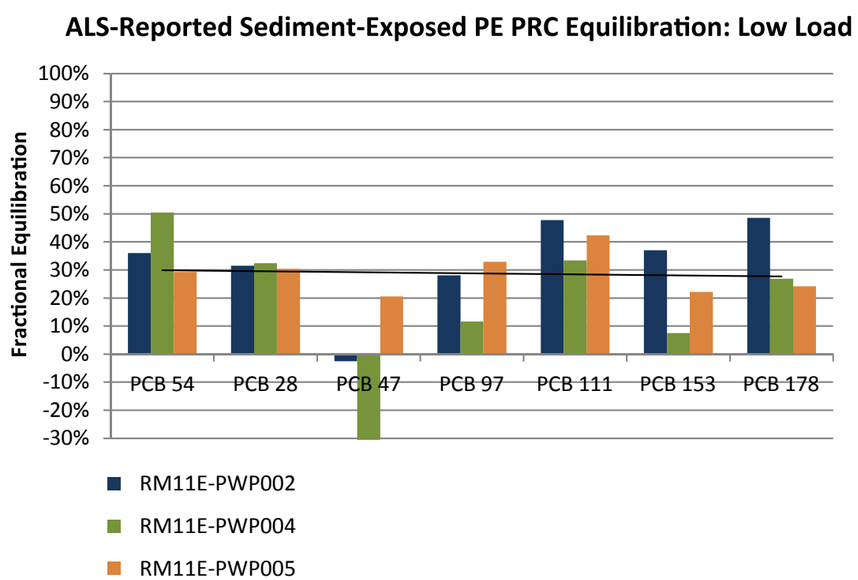

FIGURE 4-1

Comparison of ALS and MIT PRC Equilibration Results in Sediment-Exposed PE

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

NOTES:

PRC congener 47, reported by MIT at RM11E-PW004 showed anomalous equilibration. Examination of the sediment data showed a high concentration of PCB 47 in the sediments at RM11E-PW004, which may have moved into the PE. An increased concentration of PCB 47 was also noted in the ALS-reported data. In consultation with Dr. Gschwend, it was determined that the MIT PRC correction model could be run without PCB 47.

PRC congener 178 reported by MIT at RM11E-PW004 also showed anomalous equilibration relative to PRCs 97, 111 and 153. The MIT PRC correction model was run without PCB 178 included.

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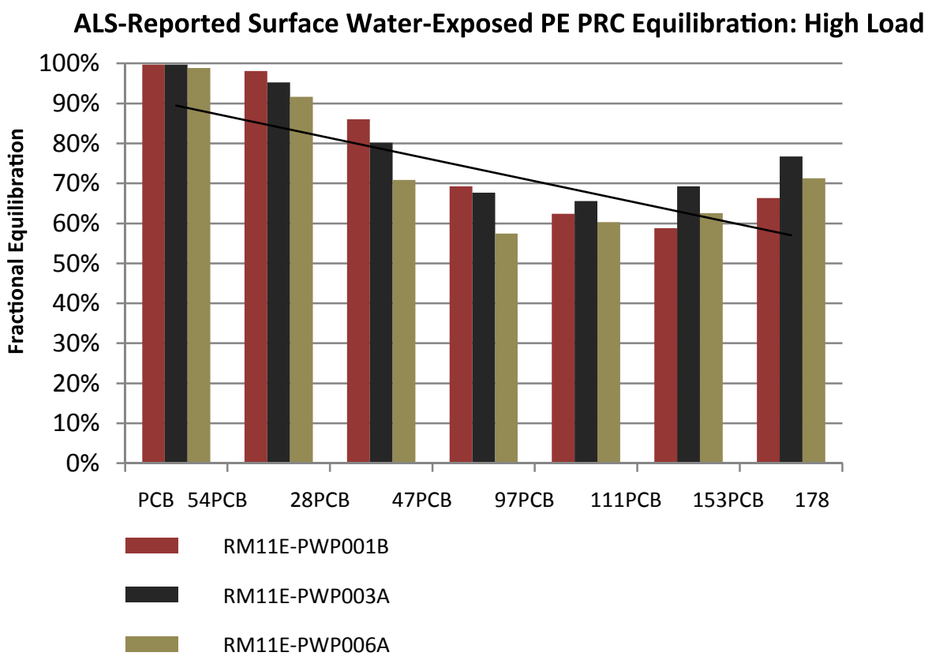

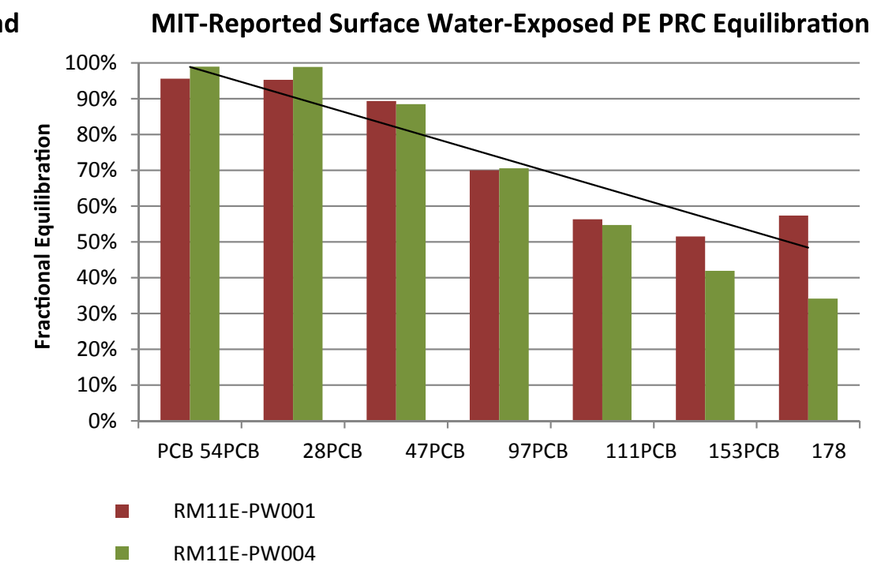

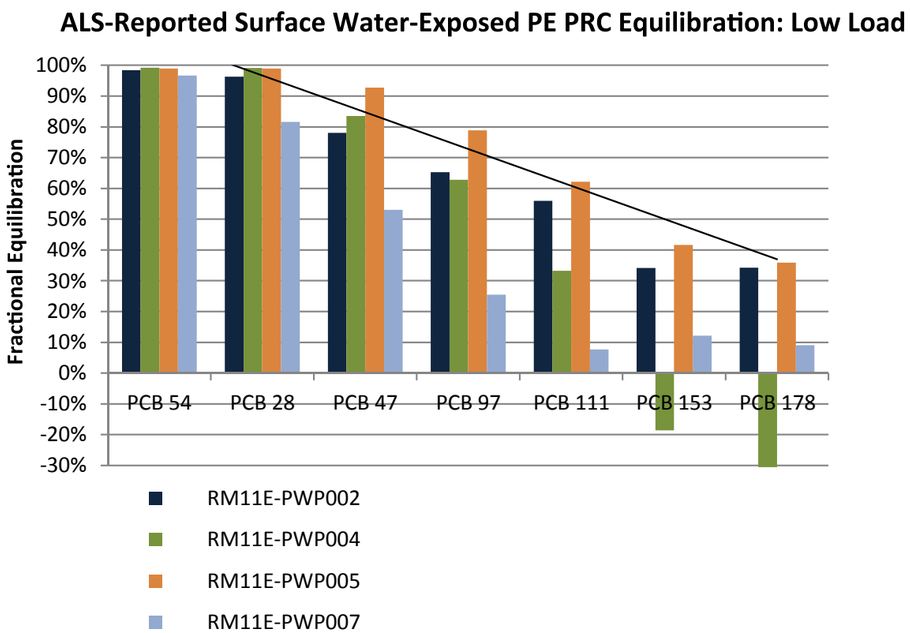

FIGURE 4-2

Comparison of ALS and MIT PRC Equilibration Results in Surface Water-Exposed PE

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

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FIGURE 5-1
Re-occupied Surface Sediment Sampling Locations

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

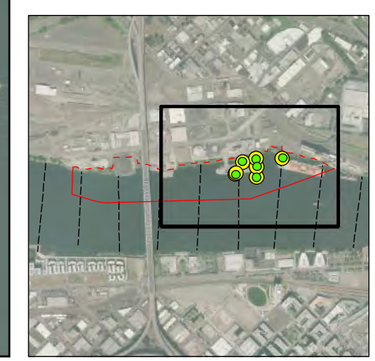
LEGEND

Re-occupied Sampling Locations

- Porewater Characterization Surface Sediment Sample
- Previous Surface Sediment Sample

All Other Features

- RM11E Project Area (dashed line indicates inferred top of bank)
- AOPC 25[4]
- U.S. Army Corps of Engineers Navigation Channel
- Cable Crossing (approximate)
- Active Outfall
- Inactive Outfall
- River Mile (RM) Tenths



MAP NOTES:

Date: May 19, 2015
AOPC = Area of Potential Concern
FS = Feasibility Study
RM = River Mile
1. The locations of all features shown are approximate.
2. Aerial photo base taken in fall 2013 by METRO.
3. RM11E Project Area includes AOPC 25 and the adjacent riverbank area to the top of bank.
4. The AOPC 25 boundary is consistent with the information presented in the Draft FS report for the Portland Harbor (Anchor QEA et al., 2012).
5. The river mile (RM) designations are based on USACE stationing along the centerline of the Lower Willamette River navigation channel and represent the distance in miles from the start of channel at the Columbia River (USACE Portland District Hydrosurvey file WR_2014_Channel.DXF).

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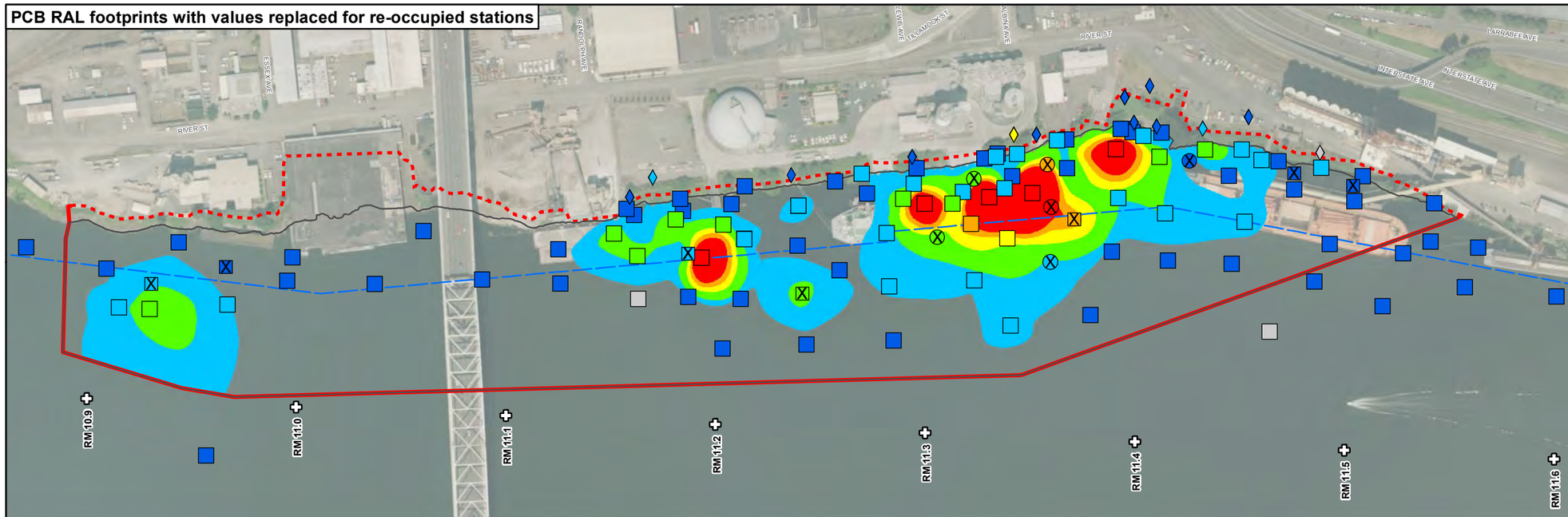
FIGURE 5-2
Total PCBs in Surface Sediment and Soil

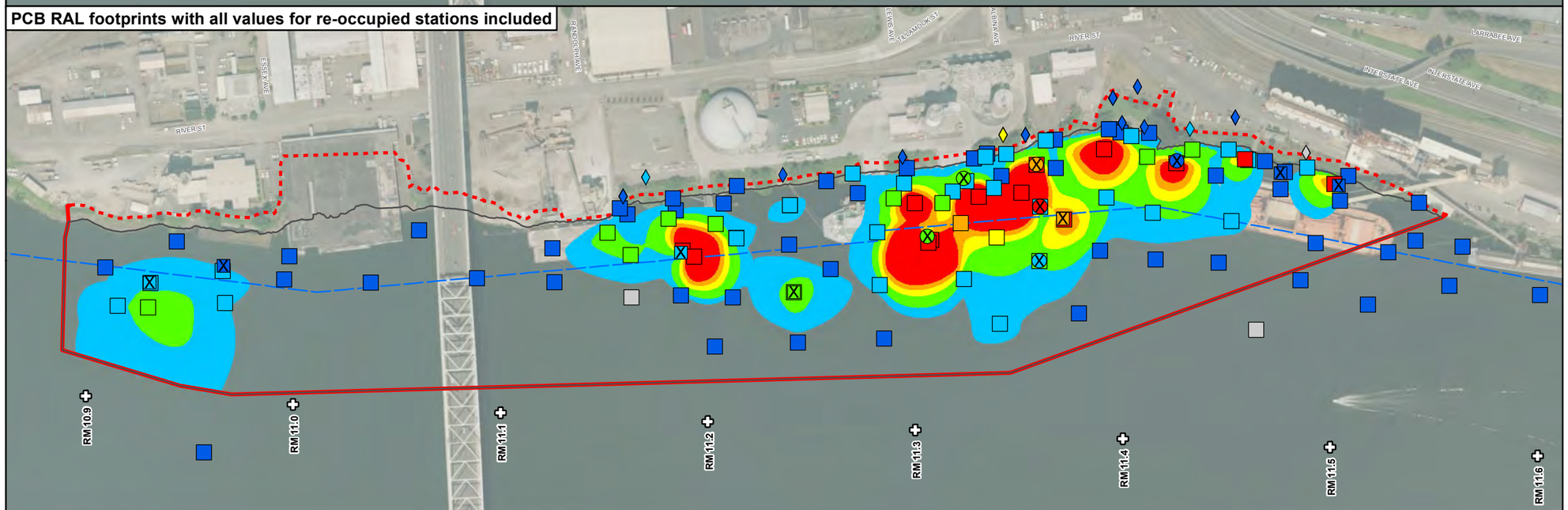
Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

PCB RAL footprints with values replaced for re-occupied stations



PCB RAL footprints with all values for re-occupied stations included



LEGEND

- Re-Occupied Porewater Characterization Surface Sediment Sample
- Re-Occupied Supplemental RI/FS Surface Sediment Sample
- Existing Surface Sediment Sample
- Existing Soil Sample

Total PCBs in Surface Sediment[7] (EPA RAL Footprints)

- Alt B: >1,000 ug/kg
- Alt C: >750 - 1,000 ug/kg
- Alt D: >500 - 750 ug/kg
- Alt E: >200 - 500 ug/kg
- Alt F: >75 - 200 ug/kg
- Below RALs: 0 - 75 ug/kg
- Non-Detect

All Other Features

- RM11E Project Area (dashed line indicates inferred top of bank)
- AOPC 25[4]
- U.S. Army Corps of Engineers Navigation Channel
- River Mile (RM) Tenths

MAP NOTES:

Date: September 4, 2015
AOPC = Area of Potential Concern
FS = Feasibility Study
PCB = Polychlorinated Biphenyl
RAL = Remedial Action Level
RI = Remedial Investigation
1. The locations of all features shown are approximate.
2. Aerial photo base taken in fall 2013 by METRO.
3. RM11E Project Area includes AOPC 25 and the adjacent riverbank area to the top of bank.
4. The AOPC 25 boundary is consistent with the information presented in the Draft FS report for the Portland Harbor (Anchor QEA et al., 2012).
5. The river mile (RM) designations are based on USACE stationing along the centerline of the Lower Willamette River navigation channel and represent the distance in miles from the start of channel at the Columbia River (USACE Portland District Hydrosurvey file WR_2014_Channel.DXF).
6. The Total PCB RAL footprints were delineated using the natural neighbor interpolations (in ArcGIS) of surface sediment (including bank soil samples collected below an elevation of 13 ft NAVD88) concentrations in a manner consistent with that used by the Lower Willamette Group in the Draft FS for the Portland Harbor.
7. For consistency with the Portland Harbor RI/FS, "Total PCB" concentrations shown rely upon PCB congener data where available and PCB Aroclor data where PCB congener analysis was not conducted.
8. The source of the sediment and soil data is the RM11E dataset described in Section 10.2 of the Supplemental RI/FS Field Sampling and Data Report (GSI, 2014) and updated in accordance with Section 4.4.3 of this Porewater Characterization Report. Total PCB concentrations were calculated using the Portland Harbor FS (RA/background) data rules.

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FIGURE 6-1

PCB Patterns in MIT Reported Sediment and Porewater and Surface Water Concentrations Estimated from PE

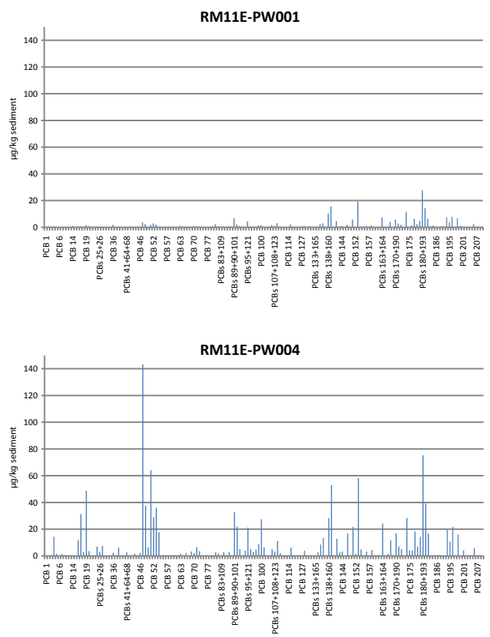
Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

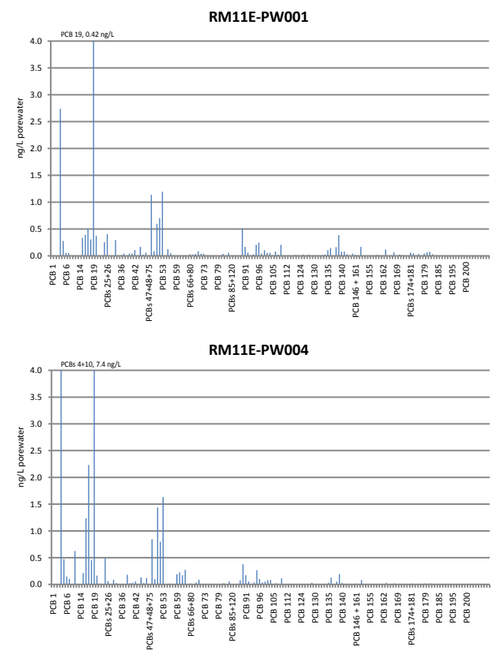
PW001
Total PCBs in Sediment (RI Calc)
Total PCB Aroclors (ALS) = 82 µg/kg
Sum Congeners (MIT) = 433 µg/kg
PRC "High Load"

PW004
Total PCBs in Sediment (RI Calc)
Total PCB Aroclors (ALS) = 1260 µg/kg
Sum Congeners (MIT) = 1394 µg/kg
PRC "Low Load"

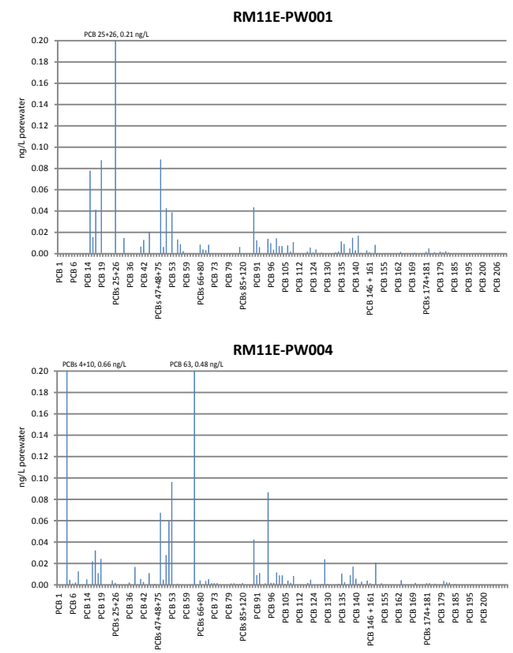
PCB Congeners Measured in Sediment (MIT)



PCB Congeners Estimated in Porewater (MIT)



PCB Congeners Estimated in Surface Water (MIT)



NOTES:

The figure includes the sum of the total PCB Aroclors (ALS) and congeners (MIT and ALS) using the RI calculation, and the congener distribution patterns in the bulk sediment, porewater, and surface water. The figure also includes whether the PE was a "high load" or "low load" station for perfomance reference compounds (PRCs). PRC data were not included in the porewater and surface water plots.

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FIGURE 6-2

PCB Patterns in ALS Reported Sediment and Surface Water Concentrations Estimated from PE: Low Load

Porewater Characterization Report
River Mile 11 East

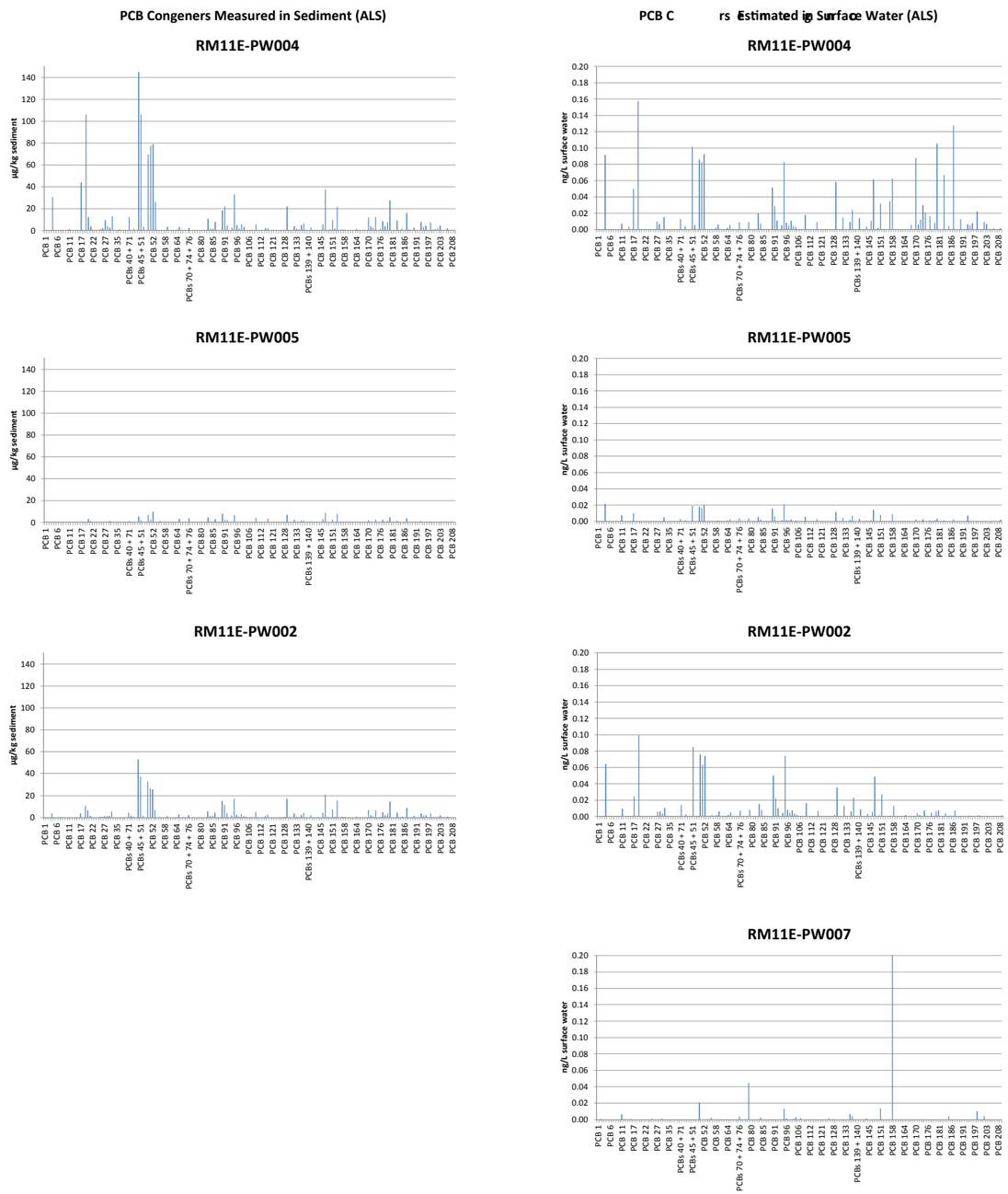
Willamette River
Portland, Oregon

PW004
Total PCBs (RI Calc)
Total PCB Aroclors = 1600 µg/kg
Total PCB Congeners in Sediment = 1180 µg/kg
Sum Surface Water Congeners = 1.91 ng/L
PRC "Low Load"

PW005
Total PCBs (RI Calc)
Total PCB Aroclors = 55 µg/kg
Total PCB Congeners in Sediment = 157 µg/kg
Sum Surface Water Congeners = 0.29 ng/L
PRC "Low Load"

PW002
Total PCBs (RI Calc)
Total PCB Aroclors = 170 µg/kg
Total PCB Congeners in Sediment = 479 µg/kg
Sum Surface Water Congeners = 1.04 ng/L
PRC "Low Load"

PW007
PCBs in Sediment not measured
Sum Surface Water Congeners = 0.66 ng/L
PRC "Low Load"



NOTES:

The figure includes the sum of the total PCB Aroclors and congeners (using the RI calculation) and the congener distribution patterns in bulk sediment and surface water. The figure also includes whether the PE was a "high load" or "low load" station for perfomance reference compounds (PRCs). PRC data were not included in the surface water plots.

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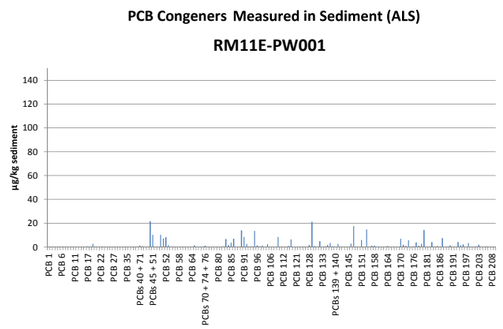
FIGURE 6-3

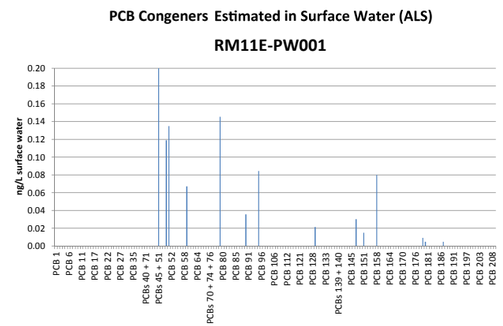
PCB Patterns in ALS Reported Sediment and Surface Water Concentrations Estimated from PE: High Load

Porewater Characterization Report
River Mile 11 East

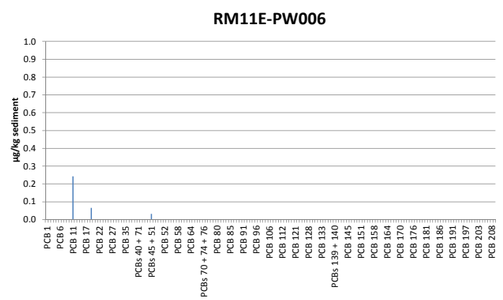
Willamette River
Portland, Oregon

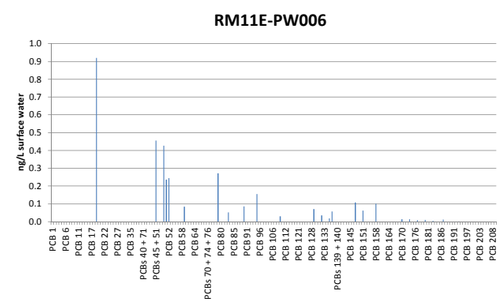
PW001
Total PCBs (RI Calc)
Total PCB Aroclors = 82 µg/kg
Total PCB Congeners in Sediment = 311 µg/kg
Sum Surface Water Congeners = 0.96 ng/L
PRC "High Load"



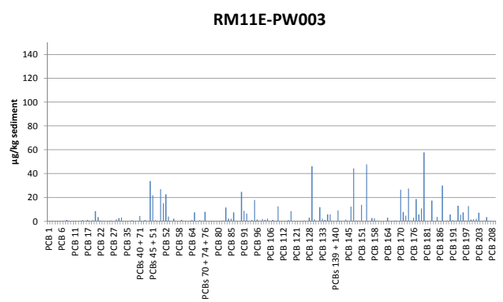


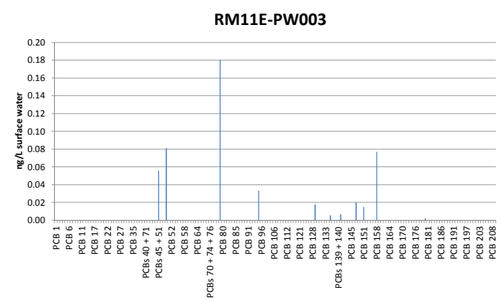
PW006
Total PCBs (RI Calc)
Total PCB Aroclors = 2.1 µg/kg
Total PCB Congeners in Sediment = 0.339 µg/kg
Sum Surface Water Congeners = 3.47 ng/L
PRC "High Load"





PW003
Total PCBs (RI Calc)
Total PCB Aroclors = 120 µg/kg
Total PCB Congeners in Sediment = 796 µg/kg
Sum Surface Water Congeners = 0.49 ng/L
PRC "High Load"





NOTES:

The figure includes the sum of the total PCB Aroclors and congeners (using the RI calculation) and the congener distribution patterns in bulk sediment and surface water. The figure also includes whether the PE was a "high load" or "low load" station for perfomance reference compounds (PRCs). PRC data were not included in the surface water plots.

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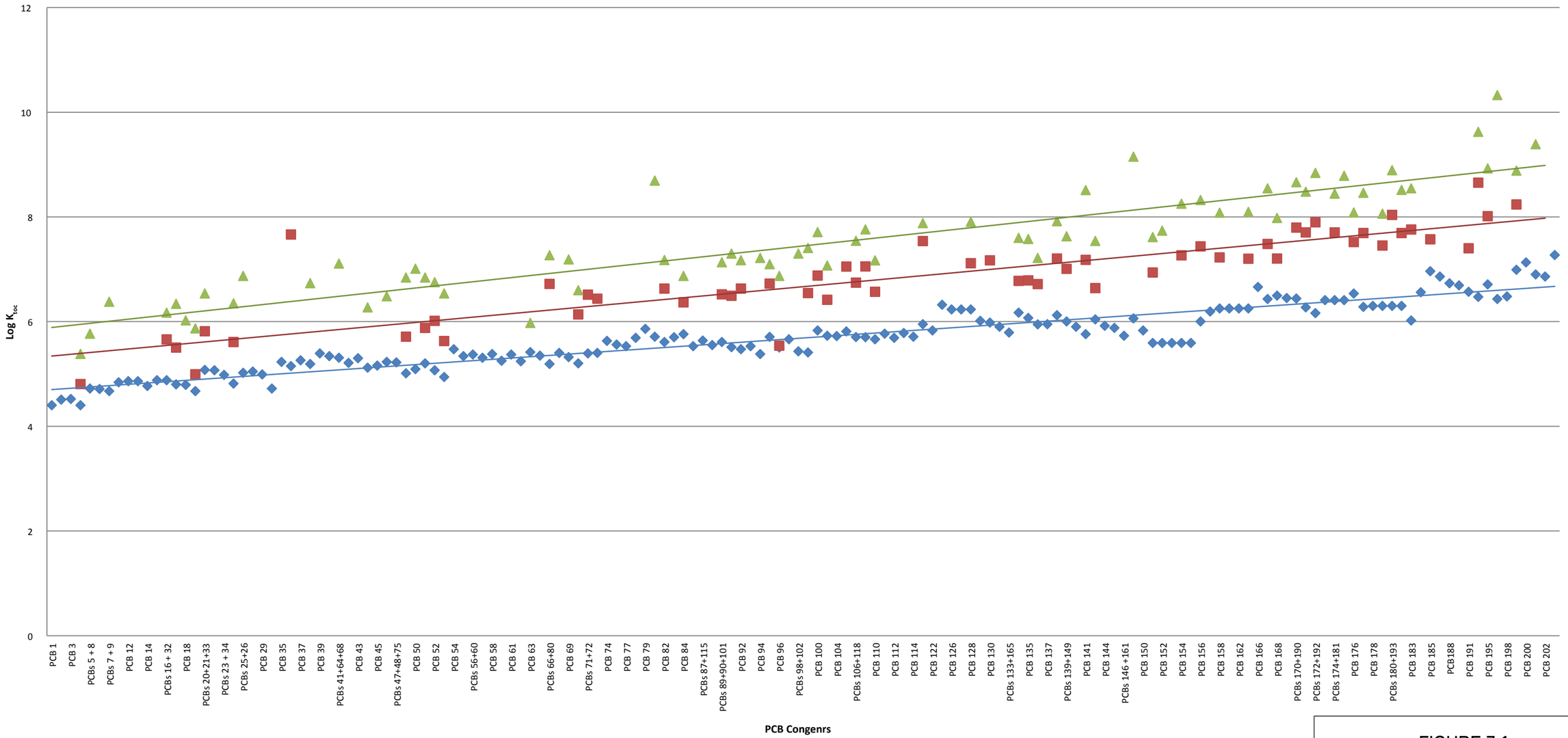
GSI Water Solutions, Inc.



LEGEND

- Literature K_{oc}
- Measured K_{oc} PW001
- Measured K_{oc} PW004
- Linear (Measured K_{oc} PW001)
- Linear (Measured K_{oc} PW004)

NOTES:

Literature-derived K_{OC} values (blue diamonds) from Hansen et al. (1999) compared to measured K_{OC} values for PW001 (red squares) and PW004 (green triangles). Measured K_{OC} values used MIT sediment PCB congener data (C_{sed}), MIT porewater PCB congener data (C_{pw}), and ALS sediment total organic carbon data (f_{TOC}): $K_{OC} = C_{sed}/(C_{pw} * f_{TOC})$. The results show that both site samples have higher K_{OC} values, which means lower availability, i.e., greater affinity for staying sorbed to the sediment matrix than for partitioning into porewater than would be calculated under default assumptions. Note: Y-axis is expressed on a log-scale.

FIGURE 7-1

Literature-Derived K_{OC} Values from Hansen et al. (1999) Compared to Site-Specific K_{OC} Values

Porewater Characterization Report
River Mile 11 East

Willamette River
Portland, Oregon

SEE LLC Science & Engineering for the Environment
GSI Water Solutions, Inc.

P:\Portland\487-DOF\Figures\Porewater_Characterization

Appendix A

Agency Communication

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL CLEANUP

September 20, 2013

Ms. Jackie Thiell Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1700
Portland, OR 97232 *Sent via email only*

RE: EPA Rationale for Inclusion of Sediment Porewater in Work Plan Scope, River Mile 11East Supplemental Remedial Investigation/Feasibility Study, CERCLA Docket No. 10-2013-0087

Dear Ms. Wetzsteon:

This letter serves to document the U.S. Environmental Protection Agency's (EPA) position regarding the need for sediment porewater data as part of the work under the Administrative Order on Consent for Removal Action (AOC) for the River Mile 11E Project Area and presents the path forward for resolution of the porewater issue. EPA transmitted its review comments to the River Mile 11 East (RM11E) Group on the June 2013 document titled *Draft Supplemental Remedial Investigation/Feasibility Study Work Plan, River Mile 11East, Portland, Oregon* (Work Plan) in letters dated August 26 and 30, 2013. The RM11E Group transmitted a written response to the comments on September 13, 2013 and the comments were discussed in teleconferences on September 6 and 17, 2013 between EPA, its partners, and the RM11E Group. Agreement was reached on all comments with the exception of those pertaining to the topic of sediment porewater as documented in an email dated September 20, 2013. Porewater was again discussed in a September 18, 2013 teleconference between EPA, its partners, and the RM11E Group. EPA maintained its position that sediment porewater sampling must be included in the scope of the Work Plan; therefore EPA and the RM11E Group were unable to reach agreement. EPA asserts that porewater data will inform multiple facets of the supplemental remedial investigation and feasibility study including the following:

- *Recontamination Potential*: Upland groundwater contamination can discharge into the Willamette River by fluxing up through sediment. In order to determine the potential for recontamination of sediment remedies from the groundwater pathway, the presence of contaminants in both porewater and upland groundwater should be characterized simultaneously. EPA recommends collection of the porewater data using passive porewater technology as it is easier and less expensive to chemically, temporally, and spatially characterize porewater samples as compared to groundwater well samples. Further savings in using the porewater data will be realized through the focused placement of additional groundwater monitoring wells, if needed.
- *Capping*: Empirical porewater data from the passive samplers will support the RM11E Group's proposed porewater modeling effort with respect to the evaluation of sediment capping as a remedial alternative for the RM11E Project Area.

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- *Bioavailability*: Hydrophobic contaminant concentrations in porewater are a better indicator of contaminant bioavailability than concentrations in sediment due to bioavailability-limiting factors in sediment such as sorption. Porewater data from the RM11E Project Area will therefore be useful in prioritizing areas for alternative analysis and remedial actions and assessing risk, and future risk reduction.
- *Baseline Data*: Porewater data collected prior to remedy selection will be useful as a baseline for comparison to future sampling events to document source control, remedy effectiveness/risk reduction and natural recovery of sediments.
- *Comparison to any Future Remedial Action Levels (RALs) for Porewater*: RALs for porewater are being developed by EPA as part of the harborwide feasibility study. Porewater data collected now will be useful for comparison to any future standards.

EPA recommends the RM11E Group consider the use of passive porewater sampler technology. Passive porewater samplers do not result in direct measurements of porewater, but rather provide calculated porewater concentrations based on partitioning coefficients integrated over time. Due to the extremely variable hydrologic conditions in upland groundwater and this estuarine river, passive sampling is the best tool to assess porewater over time in lieu of multiple piezometer snapshots of porewater chemistry. Passive samplers provide ease of use, an ability to cost-effectively collect multiple measurements, and provide time-averaged data. For more information, the RM11E Group is referred to OSWER Directive 9200.1-110 FS, *Guidelines for Using Passive Samplers to Monitor Organic Contaminants at Superfund Sediment Sites* (Dec 2012).

EPA requests that the RM11E Group agree to the porewater data collection so that the work to obtain data agreed to in the Work Plan can commence as planned on October 21, 2013. EPA and the RM11E Group can then work together to develop the scope for sediment porewater sampling which will be documented as an addendum to the Work Plan. The schedule to obtain the porewater data is negotiable; however, EPA expects delivery of the Draft Field Sampling and Data Report, Draft Recontamination Assessment Report, and Draft Implementability Study Report to follow the schedule in the Statement of Work which is Appendix A to the AOC for the River Mile 11E Project Area. This is necessary so as to not delay EPA's use of these documents in preparing the Proposed Plan for the Portland Harbor Superfund Site. Porewater data can follow as addenda to these documents as appropriate.

If the RM11E Group cannot agree to EPA's request for porewater data it must dispute the matter in writing in accordance with the dispute resolution provision of the AOC for the River Mile 11E Project Area. Please note that EPA agreed with a more limited Work Plan scope with the understanding that porewater data collection will be included. EPA's agreement on the scope for the Work Plan is contingent on the RM11E group incorporating porewater sampling into the Work Plan scope. If agreement cannot be reached, EPA reserves the right to revisit the Work Plan comments. In addition, during such a dispute, the 11E group must move forward to collect field data for agreed upon items this field season.

Please let me know if you have any questions or concerns at (206) 553-1220 or via email at Sheldrake.sean@epa.gov.

Sincerely,

Sean Sheldrake, RPM

Enclosure

Cc:

Kristine Koch, EPA *via email only*
Chip Humphrey, EPA
Dan Hafley, DEQ
Lance Peterson, CDM

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

825 NE Multnomah, 1500 LCT
Portland, OR 97232
phone (503) 813-5036

September 25, 2013

Via E-Mail

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-115
Seattle, WA 98101
Sheldrake.sean@epa.gov

Re: Inclusion of Sediment Porewater in Work Plan at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
CERCLA Docket No. 10-2013-0087

Mr. Sheldrake,

To follow-up on our recent exchanges regarding porewater, this letter provides the River Mile 11 East (RM11E) Group's response regarding performance of a porewater sampling program as part of the RM11E Administrative Order on Consent (AOC). We understand that EPA believes collection of porewater data is necessary for this investigation effort. The RM11E Group does not dispute the requirement to collect porewater data as part of this AOC. The RM11E Group just wants to ensure that (a) the objectives of any porewater program are consistent with the data quality objectives outlined in the draft Work Plan; (b) the porewater sampling program supports our efforts to inform the selection of the remedial action and assess the potential for recontamination; and (c) the scope of work builds upon the data that will be collected as part of the overall RM11E investigation.

As stated in the AOC and the Statement of Work (SOW), the collection of porewater samples was anticipated to support cap design. Specifically, Section 2.4 of the SOW states:

> *Porewater and Empirical Data to Inform Cap Design: Porewater quality, hydraulic gradients, sediment texture, and other empirical data will be collected and evaluated for input into a sediment cap isolation (advection/diffusion) model in order to inform cap design. Information from this study will be incorporated into the Field Sampling and Data Report (Section 2.7), and evaluated in the Recontamination Assessment Report (Section 2.8), and/or Implementability Study Report (Section 2.9), as appropriate.*

Based on our discussions with you and EPA's partners last week, and the rationale that you transmitted to the RM11E Group on September 20, 2013, we have a better understanding of EPA's objectives for the performance of a porewater sampling program. As we also discussed last week, the RM11E Group will be collecting a significant amount of new information this fall

that will be useful in designing a porewater sampling program. We appreciate the opportunity to collect and evaluate this information prior to developing a SAP for porewater. As currently proposed in the work plan, our initial field efforts will include the collection of additional surface sediment samples, groundwater quality data, geotechnical analysis of the bank, and detailed debris studies. All of these data will be used to determine where capping may potentially be implemented. As a result, by targeting areas where contaminated sediments may be left in place and capped, the scope of a preliminary porewater investigation will be better informed by the field data being collected this fall and more meaningful to the overall objective of the program.

The RM11E Group intends to satisfy the requirements of the AOC in a timely fashion and to conduct the majority of the data collection work to support the project objectives in 2013. Once we have collected and completed our evaluation of this new information, we will develop a porewater SAP and submit it to EPA in the spring of 2014. The number and location of porewater samples will be determined from the results of our 2013 field efforts. At this time we anticipate that the porewater data collection effort may consist of a few targeted areas with multiple passive samplers (TBD) placed within the areas identified as needing further evaluation. The final number of porewater sample points and sample depths will depend on the outcome of our field work conducted this fall in consultation with EPA.

A draft porewater investigation report will be prepared and submitted to EPA within 180 days after approval of the final Porewater SAP.

We believe this approach satisfies EPA's concerns regarding the need to conduct porewater sampling as part of this supplemental investigation effort. We will revise the Final Work Plan to reflect the requirement to develop and implement the Porewater SAP in the spring of 2014 as outlined above. While the RM11E Group does not dispute the requirement to collect porewater data under this AOC, it reserves the right to dispute any issues that may arise during development of the SAP regarding the specific objectives for the sampling or the specific scope of sampling to be conducted.

The RM11E Group remains committed to conducting a sampling program and performing data analyses that will support your efforts in the selection of a feasible remedy for RM11E and be consistent with the AOC and SOW. We understand that although the schedule to obtain the porewater data is flexible, the delivery of the Draft Field Sampling and Data Report, Draft Recontamination Report, and Draft Implementability Study Report will follow the schedule in the SOW. Porewater data will be submitted as addenda to these documents as appropriate.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

Cc (via email):

River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL CLEANUP

September 26, 2013

Ms. Jackie Thiell Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1700
Portland, OR 97232

Sent via email only

RE: Inclusion of Sediment Porewater in Work Plan at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
CERCLA Docket No. 10-2013-0087

Dear Ms. Wetzsteon:

This letter responds to the River Mile 11 East (RM11E) Group's September 25, 2013 letter agreeing to collect porewater data under the Administrative Order on Consent for Supplemental RI/FS work (AOC) for the River Mile 11E Project Area. The approach to the porewater sampling program as described in the September 25th letter is conditionally approved with the following clarifications:

1) Submittal to EPA of the RM11E Group's draft porewater sampling and analysis plan (SAP) will occur on or before March 4, 2014. An extension will be considered for unexpected issues.
2) Submittal to EPA of the RM11E Group's draft porewater investigation report will occur within 120 days after approval of the final porewater SAP. An extension will be considered for unexpected issues such as laboratory delays, etc.
3) The RM11E Group's plan to use groundwater quality data collected as part of the fall 2013 field investigation to inform design of the porewater sampling program is acknowledged. EPA believes, however, that the results of the porewater study may identify data gaps that could prompt further upland groundwater investigation.

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Please let me know if you have any questions or concerns at (206) 553-1220 or via email at Sheldrake.sean@epa.gov.

Sincerely,

Sean Sheldrake, RPM

Enclosure

Cc:

Kristine Koch, EPA *via email only*
Chip Humphrey, EPA
Dan Hafley, DEQ
Lance Peterson, CDM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL CLEANUP

April 3, 2014

Ms. Jackie Wetzsteon *sent via email only*
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232

Re: Comments on *Draft Porewater Sampling and Analysis Plan, River Mile 11 East, Willamette River, Portland, Oregon,* March 2014

Dear Ms. Wetzsteon:

Please see the enclosed EPA comments on the subject document in preparation for the teleconference on the topic tomorrow. A revised sampling and analysis plan and proposed field schedule is due within 30 days of this letter. Please let me know you have any questions or concerns about this letter at (206) 553-1220 or via email at sheldrake.sean@epa.gov

Sincerely,

Sean Sheldrake, RPM

Enclosure

Cc:

Kristine Koch, EPA *via email only*
Rich Muza, EPA
Dan Hafley, DEQ
Lance Peterson, CDM

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EPA Review Comments
Draft Porewater Sampling and Analysis Plan, River Mile 11 East, Willamette River, Portland, Oregon
Dated March, 2014

The following are U.S. Environmental Protection Agency (EPA) comments on the March 2014 document titled *Draft Porewater Sampling and Analysis Plan, River Mile 11 East, Willamette River, Portland, Oregon* (SAP) prepared by Science and Engineering for the Environment, LLC; Dalton, Olmstead and Fuglevand, Inc.; and GSI Water Solutions, Inc. on behalf of the RM11E Group.

General Comments

EPA has the following general comments pertaining to the March 2014 SAP:

1. Quantity and spatial distribution of samples: The SAP Section 1.1 states "This SAP is for the collection of porewater and associated sediment data for the specific purpose of supporting sediment cap isolation modeling, which will inform remedy selection and cap design." A limited total number of samples are currently planned, and no samples are proposed within the downstream "FS 75 ug/kg RAL boundary" region (~RM 11.25 to ~ RM 11.125, see Figure 2.2). Please either:
   a.) confirm that the proposed sample quantity and locations will be sufficient to:
      - meet modeling needs,
      - characterize physical and fate/transport heterogeneities across the site, and
      - develop predictive relationships between sediment and porewater contaminant concentrations, including the area from approximately RM 11.25 to approximately RM 11.125, or

   b.) collect additional samples in areas requiring further characterization to account for spatial heterogeneities in support of remedy selection and design.

2. Quantity and spatial distribution of samples: Please discuss the potential for polyethylene (PE) samplers to be "lost" or for the PE film to be damaged during the period of deployment, and how this loss or damage would impact the investigation. The proposed sampling locations were selected for their specific physical and chemical characteristics. Therefore, it would appear that the loss of a single sample could greatly impact this investigation. Please also consider the placement of a co-located sampler at each porewater sample location to compensate for potential lost or damaged samplers.

3. Analytes: Please discuss why other contaminants of concern (COCs) compatible with PE sampling were not chosen for analysis *in addition to* polychlorinated biphenyls (PCBs). Additionally, please provide justification for why more mobile contaminants that might influence remedial decisions were not chosen for some type of analysis. Please provide the process/technique that will be used to assess contaminant flux for non-PCB contaminants, including the potential use of other sampling technologies or standard partitioning equations.

4. Porewater investigation timing: Please discuss how a lower differential hydraulic head between upland groundwater and the Willamette River can impact porewater assessments. For example, will a lower differential hydraulic head allow for increased partitioning from the sediments into the porewater, potentially increasing the COC porewater concentration during this time period? Please consider additional sampling events during periods of lower differential hydraulic head between upland groundwater and the Willamette River to assess this possibility of sample bias during a period of high flux.

5. Duration of passive sampler deployment and performance reference compounds (PRCs): Please discuss the potential for using performance reference compounds (which are currently planned for use) to even further reduce deployment time, minimizing the potential for sampler loss. (see also General Comment 2)

6. Upstream reference station: An upstream sampling location is included for the described purpose of providing an upriver measure of dissolved porewater PCBs. Please describe how a sample at this location serves the objectives of the porewater sampling program, which are largely related to meeting the data needs of remedy selection and remedial design.

Specific Comments

EPA has the following specific comments pertaining to the March 2014 SAP:

1. Section 1.1, Purposes and Objectives, Page 1: The purpose of the investigation as defined in this section is overly narrow. Sampling results will presumably inform not only cap design, but also inform a full complement of potential remedial measures. Section 2.1 more appropriately describes how generated data can be used. Please also see the EPA letter dated September 20, 2013 for guidance to address this comment.

2. Section 2.1.2, Inputs to the Model, Pages 4-5: As noted in the text, groundwater seepage will be estimated from hydraulic gradient information generated from the Supplemental Remedial Investigation/Feasibility Study Work Plan groundwater study. Additional site specific information on flux rates may be needed for remedial decisions and design. Please describe why seepage measurements (e.g., UltraSeep) will not be collected during this investigation, preventing a correlation of porewater contaminant concentrations to discharge measurements during the same time period. Please also describe how discharge measurements will be estimated/calculated.

3. Section 2.3.2, Porewater Sampling Stations, Pages 7-9: Please indicate the date of the previous sampling events applicable to these porewater and sediment samples, and discuss whether erosion or deposition is likely to have occurred in the intervening period. If erosion or deposition has occurred, does this affect their use in fulfilling project objectives, or will there be more of a reliance on the new sediment results in assessing partitioning from sediment to porewater?

4. Section 2.4, Preliminary Remediation Goals as Design Inputs, Page 9: Please update references to preliminary remediation goals (PRGs) (e.g., Table 2-3, page 9, etc.) to reflect the latest PRG values provided by EPA to the Lower Willamette Group on March 3, 2014.

5. Section 3, Project Organization, Pages 10-12: The following contact information for the EPA Remedial Project Manager should be added to this section for purposes of Field Change Request submittal:
   Sean Sheldrake, Unit Diving Officer, RPM
   EPA Region 10, 1200 Sixth Ave., Suite 900

Seattle, WA 98101
206.553.1220 (desk)
206.225.6528 (cell)

6. Sections 4.3, Navigation and Sample Locating, Page 15: Please discuss the tools and methods used to locate these "older" sediment samples, the tools and methods that will be used to locate the proposed samples, and the need to co-locate these samples with previous sediment sample locations.

7. Section 4.4, Field Porewater Reconnaissance Survey, Page 15: Please discuss the need to collect both surface and subsurface sediment samples if sampling locations have to be moved because of impediments to passive sampler placement.

8. Section 4.5, Field Deployment and Retrieval Methods, Page 17: Please provide rationale for collecting the sediment core after the PE sampler has been retrieved, as opposed to collecting it immediately *before* the sampler is retrieved. Please detail what analytical impacts may result from disturbing the sediments by removing the PE sampler prior to core collection.

9. Section 4.5, Field Deployment and Retrieval Methods, Pages 17: Although mentioned in the Attachment 3 SOP, please also state in Section 4.5 that the sediment interval within the core tube will be measured and recorded immediately after retrieval upon the sampling vessel.

10. Section 4.5, Field Deployment and Retrieval Methods, Pages 17: Although stated in Section 4.7, please also state in Section 4.5 that cores will be extruded and logged, including the notation of stratigraphic features. Please also state that the core will need to be inserted and collected in a fashion that preserves this stratigraphy, and that this need will be communicated to the divers. The rational for how the cores are to be collected should also be added to the Attachment 3 SOP.

11. Section 4.6, Post-Processing PE Samplers, Page 18: A sample of the laboratory-grade water used to prevent sample dehydration should also be analyzed for the same analytes as the passive samplers.

12. Section 4.7, Sediment Core Sample Processing, Page 18: For clarity during sample processing, please provide clarification as to what constitutes "visible uniformity" while mixing sediments; i.e., will "visible uniformity" be determined by distribution of grain size, sediment color, etc.?

13. Section 5.2, Porewater Samplers, Pages 20-21: Please list any expected deviations during passive sampler analysis from the Massachusetts Institutes of Technology (MIT)-developed standard operating procedures. Please also state that any deviations from these procedures will be documented.

14. Table 2-1: The flux of contaminants from subsurface sediments into surface sediments is an important element in assessing contaminant flux, and is a model input identified in Table 2-1. Collection of subsurface porewater and sediment samples (>30 cm) is not proposed. There appears to be a reliance on previous subsurface sampling results in assessing flux from deeper sediments to the surface sediments. Please explain how the flux of subsurface contaminants to surface sediments will be quantified for use in models and evaluations including any potential issues regarding the use of previous subsurface sampling results.

15. Table 2-2: This table indicates that samples RM11E-PW002, RM11E-PW003, and RM11E-PW006 will be located in the engineered cap zone. Figure 2-2 shows these same samples in/adjacent to the "In-Situ Treatment Area", but outside of the "Engineered Cap Zone". Please revise the table text appropriately.

16. Table 4-4: Sediment samples (0 to 30 cm) are proposed for PCB and sediment "conventionals" analyses. Please describe in an appropriate location in the text how any significant variations between "new" sediment results and those from previous sampling efforts will be addressed, particularly in interpreting porewater concentration results.

17. Attachment 3 SOP, Section 6: Please state that either:
    a.) the entire Section 6 will be read through each morning at the start of the dive operation to ensure diver familiarity with specific procedures, or
    b.) a separate, concise attachment will be prepared for use during the daily dive briefing to ensure a high level of sample quality control.

18. Attachment 3 SOP, Section 6-7, page 5 of 10: please add the following language: "If the diver notes any rips or tears in the PE membrane before or during insertion, sample deployment must be aborted and a new sampler obtained in order to proceed." (*the current phrasing only references inspecting for tears if refusal is encountered*).

19. Attachment 3 SOP, Section 6-11, page 6 of 10: Please note that for Region 10's dive operations, the tag line is typically attached to a point or anchor on shore, versus just being a short submerged line.

From:	Wetzsteon, Jackie
To:	undisclosed-recipients
Subject:	River Mile 11E Updates on the Draft Porewater SAP and the Diver Assisted Sampling Program
Date:	Thursday, April 17, 2014 4:24:34 PM
Attachments:	RM11E Group Response to EPA Comments on Porewater SAP 04172014.pdf SOP dive samples 12 3 13_Revised 041714_Clean.pdf SOP dive samples 12 3 13_Revised 041714_Redline.pdf

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Hi Sean,

As we briefly discussed on the telephone today, I am transmitting several documents to you for your consideration.

Draft Porewater SAP

In anticipation of the conference call next Tuesday at 9 am between our technical teams, the RM11E Group has prepared a table that outlines our response to each of EPA's comments on the draft Porewater SAP that were transmitted to the group on April 3, 2014. The table is attached for your review and consideration and will serve as the basis for our discussion next Tuesday.

14-Day Notification of Diver Assisted Sampling Program

Based on updated shipping schedules from Glacier NW and Cargill, the optimum time to conduct the diver assisted sampling program is May 1-2, 2014. With this e-mail and in accordance with Paragraph 26c of the Administrative Settlement Agreement and Order on Consent , the RM11E Group is providing you with a 14-day notice of sampling program. We have received written confirmation from Ballard Marine Group that they are available on these dates.

Updated SOP for Diver Assisted Sediment Sample Collection

In order to allow for the collection of sufficient sediment sample volume to meet the modified analytical scheme that now includes dioxins/furans for some samples, the RM11E Group has modified the diver-assisted SOP to include a 4-inch diameter sampling device (vs. the 2-inch devices noted previously). A redline of the SOP as well as a clean version are attached for your information. Please let us know if you have any questions or concerns.

We look forward to our discussions with you next Tuesday about porewater and getting in the water to collect those sediment samples on May 1st.

Thanks so much,

Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232
(503) 813 5036 (work)
(503) 961 3955 (cell)

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
G1	General	**Quantity and spatial distribution of samples:** The SAP Section 1.1 states "This SAP is for the collection of porewater and associated sediment data for the specific purpose of supporting sediment cap isolation modeling, which will inform remedy selection and cap design." A limited total number of samples are currently planned, and no samples are proposed within the downstream "FS 75 ug/kg RAL boundary" region (~RM 11.25 to ~ RM 11.125, see Figure 2.2). Please either: a.) confirm that the proposed sample quantity and locations will be sufficient to: • meet modeling needs, • characterize physical and fate/transport heterogeneities across the site, and • develop predictive relationships between sediment and porewater contaminant concentrations, including the area from approximately RM 11.25 to approximately RM 11.125, or b.) collect additional samples in areas requiring further characterization to account for spatial heterogeneities in support of remedy selection and design.	The quantity and spatial distribution of the samples are consistent with the Purpose and Objectives of the Work Plan, and consistent with the requirements of the Statement of Work. As discussed in Section 2.1.1 the porewater data can be used with multiple different models to evaluate a wide range of remedial considerations without collecting any additional samples beyond the locations originally proposed. The RM11E Group believes that the proposed sampling design is sufficiently robust for a supplemental RI/FS-level assessment, and no additional samples are planned for the Porewater SAP. The data are expected to provide information on chemical partitioning and groundwater/porewater conditions than can be directly used in cap design and performance modeling. The sample stations have been selected to capture a range of concentrations of PCBs that span four orders of magnitude, as well as capture a variety of sediment physical conditions in nearshore and near-channel locations that encompass the bounds of groundwater influences that may affect PCB fate relative to capping performance. Because of the diversity in chemical and physical conditions under which the samplers will be deployed, the predictive relationships are expected to be applicable to other areas of the Site. In regards to the RM 11.25 to RM 11.125 area, the concentrations of PCBs in sediments in that area are within the range of PCBs expected in the currently proposed sampling, so the model that is targeted for development will include the range of chemical conditions encountered in that area (no extrapolation will be needed for the model to be used to understand fate in the downstream area). As was discussed during an April 4, 2014, conference call between the RM11E Group and EPA's team, the SAP is intended to address multiple factors aiding in the development of location-specific predictive relationships that can be applied to the area encompassed by the "FS 75 µg/kg RAL boundary" region.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
G2	General	**Quantity and spatial distribution of samples:** Please discuss the potential for polyethylene (PE) samplers to be "lost" or for the PE film to be damaged during the period of deployment, and how this loss or damage would impact the investigation. The proposed sampling locations were selected for their specific physical and chemical characteristics. Therefore, it would appear that the loss of a single sample could greatly impact this investigation. Please also consider the placement of a co-located sampler at each porewater sample location to compensate for potential lost or damaged samplers.	The potential for sampler loss is a concern principally for locations RM11E-PW001, RM11E-PW004, and RM11E-PW005, which are offshore on the riverward side of the Glacier dock. We will modify the SAP and Diver SOP to clarify the following: • The three inshore stations (RM11E-PW002, RM11E-PW003, and RM11E-PW006) are relatively protected from hydrodynamic forces and will be tethered to either dock pilings or suitable onshore structures. Upstream location RM11E-PW007 is exposed to river currents, but we will locate an onshore point and tether that station as well. • For the three offshore locations, we will include two anchor lines per sampler. We will also include the use of pingers (Benthos ALP365 Pinger) for each offshore sample to assist in location and retrieval at the end of the exposure period. • At each offshore location there will a second independently anchored passive sampler installed, positioned approximately 8 inches from the first sampler. • Tether lines will be anchored on the river bed and to pilings for the nearshore stations where practicable. Buoys will not be attached to the lines to minimize any possibility of public interference with the samplers and floating debris snagging the buoys. Since submittal of the March 3, 2014, SAP we have made the following modifications to the basic MIT sampler and sampler deployment/retrieval methods: 1. The SAP and SOP describe the use of a 15-cm-wide PE strip to interrogate the sediment; the MIT method uses a 5-cm width. We built a prototype of the 15-cm-wide sampler and conducted initial field tests and found that the design was too flexible and potentially prone to bending. We built a second prototype using a 10-cm width and found it was sufficiently rigid to effectively penetrate hard shell-hash in field trials, and did not flex or bend even when the sampler was hammer-driven. The SAP and SOP will be amended to reflect the design change. Table 4-3 will also be modified to reflect that the PE field replicates and the samples to be co-analyzed by ALS and MIT will be taken from those three offshore sites (RM11E-PW001, RM11E-PW004, and RM11E-PW005) where we will deploy two samplers per location. Those samples will be taken from the same single sampler. 2. Regarding the potential for damage to the PE film during deployment, we have developed a thin (0.02 inch) stainless steel cover that will be in place during deployment, and can be readily slipped out by the divers after deployment. In the same field trials discussed above, the sampler with the cover was inserted into the sediment without damage to the PE strip at multiple installations. 3. We have devised and field tested a slide-hammer that fits over the top of the PE sampler that will allow the diver to drive-in the sampler if necessary. 4. Sediment core sample retrieval will be sequenced as follows: the sediment core will first be driven between (or next to the sampler in the case of the inshore stations), left in place while the passive samplers are removed and secured, and then removed. This will be done to limit the potential for disturbing the sediment core profile. The SAP and SOP will be modified to include these changes.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
G3	General	**Analytes:** Please discuss why other contaminants of concern (COCs) compatible with PE sampling were not chosen for analysis *in addition to* polychlorinated biphenyls (PCBs). Additionally, please provide justification for why more mobile contaminants that might influence remedial decisions were not chosen for some type of analysis. Please provide the process/technique that will be used to assess contaminant flux for non-PCB contaminants, including the potential use of other sampling technologies or standard partitioning equations.	COCs that are compatible with PE sampling include PCBs, PAHs, butyltins, dioxins/furans, some pesticides, and some SVOCs. During the April 4, 2014, conference call between the RM11E Group and the EPA team, dioxins and pesticides were identified as two other potential COCs of interest at the RM11E site. Justification for why these COCs were not selected for further analysis is outlined below. • With the exception of one sample, RM11E-G039, dioxin/furan TEQ concentrations in surface sediment and bank soils are less than the most conservative Alternative G remedial action level (RAL) of 0.012 ug/kg identified by EPA for use in the Portland Harbor on March 3, 2014. The RM11E Group has agreed to re-occupy the RM11E-G039 sample station and perform additional dioxin/furan and PCB analysis in sediment in this vicinity to determine the significance of this analyte group as it relates to remedy selection and design in this area. • While several of the DDx pesticides concentrations were originally mapped at concentrations greater than the Alternative E-G Remedial Action Levels in the RM11E Project Area, these mapped concentrations, in addition to other organochlorine pesticides results (such as chlordanes), have been shown to be incorrect as a result of being biased high based on the presence of elevated PCBs and matrix interference issues associated with the standard method of pesticide analysis (GC/ECD). As stated in Section 3.3.2 of the RM11E Supplemental RI/FS Work Plan, re-analysis of 12 sediment samples from the RM11E Project Area by a high resolution method (GC/MS/MS) indicated that most of the previously reported elevated pesticide concentrations were biased high and all of the resultant DDx concentrations using the high resolution method were actually below the Alternative F RAL after re-analysis (GSI, 2013). Based on the above, we have concluded that porewater evaluation of dioxins/furans, and pesticides are not warranted. The RM11E Group has not identified other compounds that we expect to influence remedial decisions to a degree that requires *in situ* porewater sampling. As necessary, contaminant flux of other contaminants will be evaluated using standard equilibrium partitioning equations. Also see response to Specific Comment S2.
G4	General	**Porewater investigation timing:** Please discuss how a lower differential hydraulic head between upland groundwater and the Willamette River can impact porewater assessments. For example, will a lower differential hydraulic head allow for increased partitioning from the sediments into the porewater, potentially increasing the COC porewater concentration during this time period? Please consider additional sampling events during periods of lower differential hydraulic head between upland groundwater and the Willamette River to assess this possibility of sample bias during a period of high flux.	Porewater sampling is being conducted to inform remedy design, especially capping and the potential need for the addition of PCB-sequestering amendments. A component of cap design is the migration of PCBs in porewater through the cap from underlying sediment. As stated in the SAP, the design condition for capping would be the period when physical groundwater flow is hypothetically at its maximum and the proposed sampling period provides this condition. The late summer period was selected because groundwater flow is reliably toward the river, and there will be a net flux of groundwater to porewater, and porewater to surface water. Collecting porewater under this hydraulic condition will better assist in evaluating impacts of porewater on sediment cap design than would lower flux conditions when there is a lower differential head between upland groundwater and the river. To capture the overall effect of this, we have proposed to keep the samplers in place for a 60-day period to provide a representative measure of the porewater. Additional sampling events are not planned as part of this porewater study.
G5	General	**Duration of passive sampler deployment and performance reference compounds (PRCs):** Please discuss the potential for using performance reference compounds (which are currently planned for use) to even further reduce deployment time, minimizing the potential for sampler loss. (see also General Comment 2)	As discussed in response to General Comment G2, the RM11E Group is directly addressing the potential for sampler loss in several ways and does not believe that shortening the duration of the deployment is necessary to protect samplers. Further, we do not propose any changes to the duration of deployment of the samplers because the 60-day installation duration should provide more robust results than would a shorter period. A shorter deployment time would not result in sufficient loss of the Performance Reference Compounds (PRC) from the PE to allow an adequate evaluation of equilibrium. The 60-day deployment was recommended by MIT, and is consistent with the deployment period that was used for the Lower Duwamish Waterway (November 2012 – January 2013).

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
G6	General	**Upstream reference station:** An upstream sampling location is included for the described purpose of providing an upriver measure of dissolved porewater PCBs. Please describe how a sample at this location serves the objectives of the porewater sampling program, which are largely related to meeting the data needs of remedy selection and remedial design.	We will modify the SAP to reflect that the design of the sampling program at RM11E is intended to provide measures of the flux of PCBs within sediments, and a measure of the freely dissolved PCBs that move out of the sediment and into the river. We are principally interested in the in-water portion of the upstream reference station PE. This station (sediment, porewater, and surface water) may provide insight on which PCB congeners are contributed by upstream sources. The in-sediment analytical data from the upstream station should also serve a second function in defining the lower boundaries (lowest PCB congener concentration) for the Two-Carbon Partitioning Model.
Specific Comments			
S1	Section 1.1, Purposes and Objectives, Page 1	The purpose of the investigation as defined in this section is overly narrow. Sampling results will presumably inform not only cap design, but also inform a full complement of potential remedial measures. Section 2.1 more appropriately describes how generated data can be used. Please also see the EPA letter dated September 20, 2013 for guidance to address this comment.	We will modify Section 1.1 to reflect the objectives and data uses described in Section 2.1. Also see response to General Comment G1.
S2	Section 2.1.2, Inputs to the Model, Pages 4-5	As noted in the text, groundwater seepage will be estimated from hydraulic gradient information generated from the Supplemental Remedial Investigation/Feasibility Study Work Plan groundwater study. Additional site specific information on flux rates may be needed for remedial decisions and design. Please describe why seepage measurements (e.g., UltraSeep) will not be collected during this investigation, preventing a correlation of porewater contaminant concentrations to discharge measurements during the same time period. Please also describe how discharge measurements will be estimated/calculated.	Groundwater seepage will be evaluated in the Recontamination Assessment and Implementability Study using data collected during the Supplemental RI/FS. Groundwater seepage will be estimated based on a standard approach that uses the hydraulic gradients (i) between upland wells and the Willamette River (taking seasonal variation into account) and an estimated range of hydraulic conductivity values (k) from geologic samples from the shoreline wells and sediments collected in the area. A version of this method (Lampert and Reible steady-state model, 2009) was used to evaluate capping in the Portland Harbor FS. Seepage velocity will be calculated by multiplying gradient and hydraulic conductivity. Mass flux will be estimated by multiplying seepage velocity by porewater concentration. Measurement of groundwater seepage velocities to more precisely evaluate contaminant flux rates may be an important consideration in sediment cap design (thickness and amendments); however, collection of empirical seepage data is not warranted at this time for the following reasons: • The distribution of porewater concentrations and location of potential future caps are not known; therefore, targeting placement of individual flux meters would be speculative. • The hydraulic gradient between groundwater and the river is low in the Portland Harbor (lower Willamette Basin), which indicates low seepage velocities and flux rates. Sediment caps at two nearby sites (Zidell and McCormick & Baxter) were designed using estimated flux rates rather than empirical measurements. Finally, we have concerns about the limitation of using seepage meters like the UltraSeep for this level of study. These meters are single point-in-time measures at a limited spatial scale. Use of these meters for evaluating site-wide recontamination and implementability issues is inappropriate for this study.
S3	Section 2.3.2, Porewater Sampling Stations, Pages 7-9	Please indicate the date of the previous sampling events applicable to these porewater and sediment samples, and discuss whether erosion or deposition is likely to have occurred in the intervening period. If erosion or deposition has occurred, does this affect their use in fulfilling project objectives, or will there be more of a reliance on the new sediment results in assessing partitioning from sediment to porewater?	The exact sample dates will be added to Table 2-3 of the Porewater SAP for clarity. With the exception of the existing LWG samples LW3-UG02/UC02, which were collected in 2007 and re-occupied by surface sample RM11E-G079 in 2013, the other existing samples were collected as part of the 2009 RM11E Focused Sediment Characterization. While some erosion or deposition has likely occurred, the stations re-occupied during the October 2013 sampling event indicated that there had not been significant changes in concentrations since the 2009 sampling. The porewater SAP was developed to collect data across a wide range of likely conditions at the site, based on information available at the time the SAP was prepared. Based on the current information there is no reason to believe that sediment characteristics have changed considerably from 2009. Both the past and new sediment data will be used from a preponderance of evidence perspective to evaluate the porewater data.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
S4	Section 2.4, Preliminary Remediation Goals as Design Inputs, Page 9	Please update references to preliminary remediation goals (PRGs) (e.g., Table 2-3, page 9, etc.) to reflect the latest PRG values provided by EPA to the Lower Willamette Group on March 3, 2014	The PRG references will be updated to reflect the March 3, 2014, values as requested.
S5	Section 3, Project Organization, Pages 10-12	The following contact information for the EPA Remedial Project Manager should be added to this section for purposes of Field Change Request submittal: Sean Sheldrake, Unit Diving Officer, RPM EPA Region 10, 1200 Sixth Ave., Suite 900	We will add this information and also add Sean's email address, since the Field Change Request will be submitted electronically.
S6	Sections 4.3, Navigation and Sample Locating, Page 15	Please discuss the tools and methods used to locate these "older" sediment samples, the tools and methods that will be used to locate the proposed samples, and the need to co-locate these samples with previous sediment sample locations.	We will clarify in the SAP that Appendix C of the RM11E Work Plan describes the navigation procedures to be used in this study, and that the navigation equipment and procedures are consistent with those previously employed for the "older" sediment samples. The 2009 sediment study at RM11E used a dual frequency Trimble GeoXH GPS on the sampling vessel to achieve sub-meter accuracy. The field coordinates were submitted to DOF and post-processed using a subscription service to increase location precision. In the few instances when coordinates either were not collected or there was insufficient satellite coverage or geometry for the Trimble GeoXH GPS receiver, the coordinates simultaneously collected by the vessel operator (± 1m) were utilized.
S7	Section 4.4, Field Porewater Reconnaissance Survey, Page 15	Please discuss the need to collect both surface and subsurface sediment samples if sampling locations have to be moved because of impediments to passive sampler placement.	Based on the changes made to the passive sampler (see response to General Comment G2), and based on a review of the logs of the prior cores and surface grab samples that were used to select the passive sample locations, we expect we will be able to install the passive sampler wherever the prior surface grabs and cores were successively collected. Consequently, we are not including new subsurface sediment sampling locations in the Porewater SAP.
S8	Section 4.5, Field Deployment and Retrieval Methods, Page 17	Please provide rationale for collecting the sediment core after the PE sampler has been retrieved, as opposed to collecting it immediately before the sampler is retrieved. Please detail what analytical impacts may result from disturbing the sediments by removing the PE sampler prior to core collection.	We will make two clarifying modifications to the SAP and SOP. First, we will modify Section 4.5 of the SAP to provide additional clarity on why the sample is collected at the end of the exposure period. In our discussions with EPA during the April 4, 2014, conference call, we understood that EPA was interested in the possibility of collecting the sediment sampler at the time the PE sampler is deployed instead of when it is retrieved. The goal is to have the sediment sample collected as close as possible to the porewater sampler. In discussions with MIT we decided that collecting a core at the time of deployment would impact the sediment column close to the passive sampler (leaving a hole in the bedded sediment), and thus could compromise the porewater sampler exposure evaluation. For the offshore locations where we will place two passive samplers at each location, we will plan on placing those samplers approximately 8 inches apart, and will take the core from a location between the two samplers. Secondly, regarding the sequence of sediment sampling and PE sampler extraction, we will modify the SAP to state the following sequence at the time of retrieval: locate the PE sampler, set the edge of the sediment core approximately two fingers from the PE sampler, advance the sediment core and leave it in place while the PE sampler is extracted, then retrieve the sediment core.
S9	Section 4.5, Field Deployment and Retrieval Methods, Pages 17	Although mentioned in the Attachment 3 SOP, please also state in Section 4.5 that the sediment interval within the core tube will be measured and recorded immediately after retrieval upon the sampling vessel.	The requested text will be incorporated into the Final Porewater SAP.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
S10	Section 4.5, Field Deployment and Retrieval Methods, Pages 17	Although stated in Section 4.7, please also state in Section 4.5 that cores will be extruded and logged, including the notation of stratigraphic features. Please also state that the core will need to be inserted and collected in a fashion that preserves this stratigraphy, and that this need will be communicated to the divers. The rational for how the cores are to be collected should also be added to the Attachment 3 SOP.	The requested text and additional explanation will be incorporated into the Final Porewater SAP, including the Attachment 3 SOP.
S11	Section 4.6, Post-Processing PE Samplers, Page 18	A sample of the laboratory-grade water used to prevent sample dehydration should also be analyzed for the same analytes as the passive samplers.	The laboratory-grade water is also the method-blank water which will be analyzed for the same analytes as the passive samplers.
S12	Section 4.7, Sediment Core Sample Processing, Page 18	For clarity during sample processing, please provide clarification as to what constitutes "visible uniformity" while mixing sediments; i.e., will "visible uniformity" be determined by distribution of grain size, sediment color, etc.?	The SAP will be modified to reflect that visible uniformity means a homogenous mixture of color, texture, density, and particle density and is free of any clay clasts.
S13	Section 5.2, Porewater Samplers, Pages 20-21	Please list any expected deviations during passive sampler analysis from the Massachusetts Institutes of Technology (MIT)-developed standard operating procedures. Please also state that any deviations from these procedures will be documented.	Section 5.2 states that the analytical methods will <u>generally</u> follow those in the MIT-SOPs. While cited, those are not intended to be specific SOPs for this project. We will modify the SAP text to state that the methods are substantively similar, with some differences as noted in the SAP. Additional clarification for consideration (but not for inclusion in the SAP) is below. • Preparation of the PED (Gschwend et al., 2012a). This document covers the procedures for cleaning and preparing the PE, the methods and which PRCs will be loaded onto the PE, and the sampler construction. ALS is in the process of developing their own SOP for the addition and analysis of PRCs to the PE; that has not yet been finalized. However, as noted currently in the SAP, the differences from the MIT procedure are in the size of the PE to be labelled (10 x 30 cm), and that ALS proposes to use different deuterated PRCs, recovery and injection standards than are used by MIT (Table 5-1). We are planning to add text and figures to show the sampler that will be used (which is modified from MIT's basic design), as noted in response to General Comment 2, above. • Deployment of the PED (Gschwend et al., 2012b). That MIT-SOP was used to develop the deployment and retrieval methods described in the RM11E SAP and in the SOP for Diver-Placement and Retrieval of Passive Samplers and Co-located Sediment Samples (Attachment 3). • PE Analysis (Gschwend et al., 2012c). This is replaced in its entirety for ALS EPA Method 1668C (high resolution GC/MS) for PCB analyses (Attachment 5 to the SAP). MIT uses a low resolution GCMS method. The lower ALS reporting limits are listed in Table 5-2, and the ALS SOP for Method 1668C is provided. Significant deviations from the procedures defined in the SAP and the SOP will be documented in the Porewater Characterization Report.
Specific Comments on Tables or Figures			
S14	Table 2-1	The flux of contaminants from subsurface sediments into surface sediments is an important element in assessing contaminant flux, and is a model input identified in Table 2-1. Collection of subsurface porewater and sediment samples (>30 cm) is not proposed. There appears to be a reliance on previous subsurface sampling results in assessing flux from deeper sediments to the surface	The comment refers principally to interpretation of the data, which will be included in the Recontamination Assessment and Implementability Study Reports. Table 2-1 identifies the flux of subsurface PCBs to surface sediments as a data need. For this study, the flux of subsurface PCBs will be considered as follows: • Evaluate the porewater data for evidence of advective or diffusive flux (see below). • Develop the Two-Carbon Partitioning Model based on the measured site data as described in the SAP. • Where the passive samplers indicate only diffusive flux, an estimation of the subsurface sediment flux for modeling is not needed. • Where the passive samplers demonstrate exfiltration, apply the site Two-Carbon Partitioning Model to the existing subsurface sediment PCB data to estimate subsurface porewater concentrations. • Apply the groundwater flow rates as described in response to Specific Comment S2 and the estimated concentration data using the CAPSIM model to evaluate

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
		sediments. Please explain how the flux of subsurface contaminants to surface sediments will be quantified for use in models and evaluations including any potential issues regarding the use of previous subsurface sampling results.	cap design. The passive samplers can indicate PCB flux and groundwater exfiltration in two ways: PCB congeners measured in the PE at concentrations higher than would be predicted from the interrogated surface sediment sampling interval, and loss of PRCs at a greater rate than expected. The passive sampler data can be used to infer whether a station is undergoing advective flux or diffusive flux based upon deviations from the expected adsorption of PCBs to the passive sampler from surface sediments, and the expected loss rates for the PRCs during exposures. Where levels of PCBs measured in the PE are at concentrations greater than would be expected using basic equilibrium partitioning estimation, the inference would be that the source is due to advective flux from the subsurface sediments. For example, at Station RM11E-PW002 the surface PCBs are relatively low (170 µg/kg total Aroclors), but at depth (1.5 m) are high (6,200 µg/kg). Using equilibrium partitioning, we expect that the total porewater concentration of PCBs measured in the surface sediment to be 14 ng/L (within a factor of 3). The EqP-estimated porewater concentration at depth is 490 ng/L. Flux of PCBs from the subsurface would be inferred if the total PE porewater concentrations measured in the surface sediment exceeded 42 ng/L (3x14 ng/L). PRCs are expected to be "lost" from the sampler at specific rates related to their sorption characteristics. PRC losses become less dependent on hydrophobicities when groundwater flushing at nearshore stations carries these compounds away before they can diffuse into the sediment (Gschwend, personal communication). For example, on the Lower Duwamish Waterway approximately 80% of the trichlor PRC PCB congeners were "lost", while the pentachlor and heptachlor PRCs were approximately 50% and 20% lost, respectively. Where PRC loss is greater than would be expected, the inference will be that the loss is due to groundwater exfiltration. We do not expect any significant issues from using the existing subsurface sediment data as described above for this FS-level analysis. See also response to Specific Question S2.
S15	Table 2-2 and Figure 2-2	This table indicates that samples RM11E-PW002, RM11E-PW003, and RM11E-PW006 will be located in the engineered cap zone. Figure 2-2 shows these same samples in/adjacent to the "In-Situ Treatment Area", but outside of the "Engineered Cap Zone". Please revise the table text appropriately.	Clarifying language will be incorporated into the Final Porewater SAP as requested.
S16	Table 4-4	Sediment samples (0 to 30 cm) are proposed for PCB and sediment "conventionals" analyses. Please describe in an appropriate location in the text how any significant variations between "new" sediment results and those from previous sampling efforts will be addressed, particularly in interpreting porewater concentration results.	See response to Specific Question S3. The determination of porewater partitioning parameters would be primarily based on the porewater results measured by the PE sampler and the immediately adjacent sediment concentrations as measured from the sediment samples collected at the time of retrieval of the PE sampler. Variations between the "new" and previous sample results would be addressed in the Recontamination Assessment and Implementability Study Reports in concert with all the additional data being collected for sediment, soil, and groundwater.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA
Specific Comments on Attachment 3 (the Diver SOP)			
S17	Attachment 3 SOP, Section 6	Please state that either: a.) the entire Section 6 will be read through each morning at the start of the dive operation to ensure diver familiarity with specific procedures, or b.) a separate, concise attachment will be prepared for use during the daily dive briefing to ensure a high level of sample quality control.	The SOP will be modified to state that the relevant portions of the SOP to that day's operation will be reviewed at the start of each day's dive operations.
S18	Attachment 3 SOP, Section 6-7, page 5 of 10	Please add the following language: "If the diver notes any rips or tears in the PE membrane before or during insertion, sample deployment must be aborted and a new sampler obtained in order to proceed." (*The current phrasing only references inspecting for tears if refusal is encountered*).	The suggested language will be incorporated into the Final Porewater SAP as requested.
S19	Attachment 3 SOP, Section 6-11, page 6 of 10	Please note that for Region 10's dive operations, the tag line is typically attached to a point or anchor on shore, versus just being a short submerged line.	Comment noted.

References

EPA. 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/guidance.pdf

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Lampert, D. J. and D. Reible. 2009. An Analytical Modeling Approach for Evaluation of Capping of Contaminated Sediments. Soil and Sediment Contamination: An International Journal, 18:4, 470-488.

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OFFICE OF
ENVIRONMENTAL CLEANUP

April 25, 2014

Ms. Jackie Wetzsteon *sent via email only*
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, 1500 LCT
Portland, Oregon 97232

RE: RM11E Group Response to Comments, RM11E Supplemental RI/FS, Draft Porewater Sampling and Analysis Plan

Dear Ms. Wetzsteon:

The U.S. Environmental Protection Agency (EPA) has reviewed the River Mile 11 East (RM11E) Group's April 17, 2014 response to EPA's April 3, 2014 comments on the RM11E Supplemental RI/FS Draft Porewater Sampling and Analysis Plan (SAP). The comment responses were discussed between EPA and the RM11E Group in an April 22, 2014 conference call. This letter serves as a follow-up to that call and EPA's position on the comment responses is presented in the attached comment table. EPA's April 3rd comment letter requested a revised SAP and proposed field schedule within 30 days of the date of the letter. This letter obviates the 30-day revised SAP submittal requirement. Please provide a proposed date for delivery of the Final Porewater SAP within 3 business days of receipt of this letter.

EPA acknowledges the RM11E Group's April 17, 2014 notice that the diver assisted sampling program will occur on May 1-2, 2014. We have also reviewed the updated Standard Operating Procedure (SOP) for diver assisted sediment sample collection provided on April 17, 2014. EPA accepts the revisions to the SOP.

Please let me know if you have any questions or concerns at (206) 553-1220 or via email at Sheldrake.sean@epa.gov.

Sincerely,

Sean Sheldrake, RPM

Enclosure

Cc:
Kristine Koch, EPA *via email only*
Rich Muza, EPA
Dan Hafley, DEQ
Lance Peterson, CDM

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G1	General	**Quantity and spatial distribution of samples:** The SAP Section 1.1 states "This SAP is for the collection of porewater and associated sediment data for the specific purpose of supporting sediment cap isolation modeling, which will inform remedy selection and cap design." A limited total number of samples are currently planned, and no samples are proposed within the downstream "FS 75 ug/kg RAL boundary" region (~RM 11.25 to ~ RM 11.125, see Figure 2.2). Please either: a.) confirm that the proposed sample quantity and locations will be sufficient to: • meet modeling needs, • characterize physical and fate/transport heterogeneities across the site, and • develop predictive relationships between sediment and porewater contaminant concentrations, including the area from	The quantity and spatial distribution of the samples are consistent with the Purpose and Objectives of the Work Plan, and consistent with the requirements of the Statement of Work. As discussed in Section 2.1.1 the porewater data can be used with multiple different models to evaluate a wide range of remedial considerations without collecting any additional samples beyond the locations originally proposed. The RM11E Group believes that the proposed sampling design is sufficiently robust for a supplemental RI/FS-level assessment, and no additional samples are planned for the Porewater SAP. The data are expected to provide information on chemical partitioning and groundwater/porewater conditions than can be directly used in cap design and performance modeling. The sample stations have been selected to capture a range of concentrations of PCBs that span four orders of magnitude, as well as capture a variety of sediment physical conditions in nearshore and near-channel locations that encompass the bounds of groundwater influences that may affect PCB fate relative to capping performance. Because of the diversity in chemical and physical conditions under which the samplers will be deployed, the predictive relationships are expected to be applicable to other areas of the Site. In regards to the RM 11.25 to RM 11.125 area, the concentrations of PCBs in sediments in that area are within the range of PCBs expected in the currently proposed sampling, so the model that is targeted for development will include the range of chemical conditions encountered in that area (no extrapolation will be needed for the model to be used to understand fate in the downstream area). As was discussed during an April 4, 2014, conference call between the RM11E Group and EPA's team, the SAP is intended to address multiple factors aiding in the development of location-specific predictive relationships that can be applied to the area encompassed by the "FS 75 µg/kg RAL boundary" region.	EPA acknowledges the RM11E Group's focus for the porewater study is cap design, particularly in nearshore areas. EPA remains concerned whether the information gained from the areas chosen for investigation is transferable to other locations in the RM11E Project Area. EPA requests that information from existing sediment sample locations be provided which can be used to evaluate whether the proposed porewater sample locations capture the range of PCB concentrations and sediment physical conditions in nearshore and near-channel locations within the FS 75 µg/kg RAL boundaries. While the results of this evaluation will not change the scope of this porewater study, they may point to the need for additional porewater sampling during a future work activity under the Administrative Settlement Agreement and Order on Consent for Supplemental RI/FS Work (AOC) or as part of

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		approximately RM 11.25 to approximately RM 11.125, or b.) collect additional samples in areas requiring further characterization to account for spatial heterogeneities in support of remedy selection and design.		remedial design. Please expand Table 2-2 to include sample information from the following sample locations within the FS 75 µg/kg RAL boundaries: • RM11E-G006 • RM11E-G076 • LW3-G776 • RM11E-G008 • RM11E-G010 • LW3-UG01 • RM11E-G077 • LW3-G777 • RM11E-C010-A(R2)/ RM11E-G013 • RM11E-C012-A/RM11E-G015 • RM11E-G019 • RM11E-G020 • RM11E-G024 • RM11E-G025 • RM11E-G065 • RM11E-G023 • LW3-G778 • LW3-GCA11E-C00 • RM11E-G082 • RM11E-G067 • LW3-GCRSP11E • RM11E-G029 • RM11E-G066 • RM11E-G030

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				• LW3-G779 • RM11E-G037 • RM11E-C033-A • RM11E-G036 • RM11E-G039 • RM11E-G064 • RM11E-G043
G2	General	**Quantity and spatial distribution of samples:** Please discuss the potential for polyethylene (PE) samplers to be "lost" or for the PE film to be damaged during the period of deployment, and how this loss or damage would impact the investigation. The proposed sampling locations were selected for their specific physical and chemical characteristics. Therefore, it would appear that the loss of a single sample could greatly impact this investigation. Please also consider the placement of a co-located sampler at each porewater sample location to compensate for potential lost or damaged samplers.	The potential for sampler loss is a concern principally for locations RM11E-PW001, RM11E-PW004, and RM11E-PW005, which are offshore on the riverward side of the Glacier dock. We will modify the SAP and Diver SOP to clarify the following: • The three inshore stations (RM11E-PW002, RM11E-PW003, and RM11E-PW006) are relatively protected from hydrodynamic forces and will be tethered to either dock pilings or suitable onshore structures. Upstream location RM11E-PW007 is exposed to river currents, but we will locate an onshore point and tether that station as well. • For the three offshore locations, we will include two anchor lines per sampler. We will also include the use of pingers (Benthos ALP365 Pinger) for each offshore sample to assist in location and retrieval at the end of the exposure period. • At each offshore location there will a second independently anchored passive sampler installed, positioned approximately 8 inches from the first sampler. • Tether lines will be anchored on the river bed and to pilings for the nearshore stations where practicable. Buoys will not be attached to the lines to minimize any possibility of public interference with the samplers and floating debris snagging the buoys. Since submittal of the March 3, 2014, SAP we have made the following modifications to the basic MIT sampler and sampler deployment/retrieval methods: 1. The SAP and SOP describe the use of a 15-cm-wide PE strip to interrogate the sediment; the MIT method uses a 5-cm width. We built a prototype of the 15-cm- wide sampler and conducted initial	Comment response acknowledged. The RM11E Group stated during an April 22, 2014 conference call with EPA that they would provide photos of the thin stainless steel cover developed for PE test deployment scheduled for May 2, 2014. These photos should be provided in an e-mail separate from the Final Porewater SAP.

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			field tests and found that the design was too flexible and potentially prone to bending. We built a second prototype using a 10-cm width and found it was sufficiently rigid to effectively penetrate hard shell-hash in field trials, and did not flex or bend even when the sampler was hammer-driven. The SAP and SOP will be amended to reflect the design change. Table 4-3 will also be modified to reflect that the PE field replicates and the samples to be co-analyzed by ALS and MIT will be taken from those three offshore sites (RM11E-PW001, RM11E-PW004, and RM11E-PW005) where we will deploy two samplers per location. Those samples will be taken from the same single sampler. 2. Regarding the potential for damage to the PE film during deployment, we have developed a thin (0.02 inch) stainless steel cover that will be in place during deployment, and can be readily slipped out by the divers after deployment. In the same field trials discussed above, the sampler with the cover was inserted into the sediment without damage to the PE strip at multiple installations. 3. We have devised and field tested a slide-hammer that fits over the top of the PE sampler that will allow the diver to drive-in the sampler if necessary. 4. Sediment core sample retrieval will be sequenced as follows: the sediment core will first be driven between (or next to the sampler in the case of the inshore stations), left in place while the passive samplers are removed and secured, and then removed. This will be done to limit the potential for disturbing the sediment core profile. The SAP and SOP will be modified to include these changes.	
G3	General	**Analytes:** Please discuss why other contaminants of concern (COCs) compatible with PE sampling were not chosen for analysis in addition to polychlorinated biphenyls (PCBs). Additionally, please provide justification for why more mobile contaminants that might influence remedial	COCs that are compatible with PE sampling include PCBs, PAHs, butyltins, dioxins/furans, some pesticides, and some SVOCs. During the April 4, 2014, conference call between the RM11E Group and the EPA team, dioxins and pesticides were identified as two other potential COCs of interest at the RM11E site. Justification for why these COCs were not selected for further analysis is outlined below. • With the exception of one sample, RM11E-G039, dioxin/furan TEQ concentrations in surface sediment and bank soils are less than the most conservative Alternative G remedial action level (RAL) of	The RM11E Group stated during an April 22, 2014 conference call with EPA that they believe PCBs to be the driver for cap design. The RM11E Group also stated that the performance reference compounds (PRC) loading process (to the PE

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		decisions were not chosen for some type of analysis. Please provide the process/technique that will be used to assess contaminant flux for non-PCB contaminants, including the potential use of other sampling technologies or standard partitioning equations.	0.012 ug/kg identified by EPA for use in the Portland Harbor on March 3, 2014. The RM11E Group has agreed to re- occupy the RM11E-G039 sample station and perform additional dioxin/furan and PCB analysis in sediment in this vicinity to determine the significance of this analyte group as it relates to remedy selection and design in this area. • While several of the DDx pesticides concentrations were originally mapped at concentrations greater than the Alternative E-G Remedial Action Levels in the RM11E Project Area, these mapped concentrations, in addition to other organochlorine pesticides results (such as chlordanes), have been shown to be incorrect as a result of being biased high based on the presence of elevated PCBs and matrix interference issues associated with the standard method of pesticide analysis (GC/ECD). As stated in Section 3.3.2 of the RM11E Supplemental RI/FS Work Plan, re-analysis of 12 sediment samples from the RM11E Project Area by a high resolution method (GC/MS/MS) indicated that most of the previously reported elevated pesticide concentrations were biased high and all of the resultant DDx concentrations using the high resolution method were actually below the Alternative F RAL after re-analysis (GSI, 2013). Based on the above, we have concluded that porewater evaluation of dioxins/furans, and pesticides are not warranted. The RM11E Group has not identified other compounds that we expect to influence remedial decisions to a degree that requires *in situ* porewater sampling. As necessary, contaminant flux of other contaminants will be evaluated using standard equilibrium partitioning equations. Also see response to Specific Comment S2.	samplers) needs to begin at least 60 days before field deployment, which is currently planned for August 2014. Given the above two considerations, EPA conditionally accepts the current proposal to analyze the porewater passive samplers for PCBs only. However, additional porewater sampling, including additional analytes, may be requested as part of the AOC based on EPA's review of the forthcoming Draft Field Sampling and Data Report.
G4	General	**Porewater investigation timing:** Please discuss how a lower differential hydraulic head between upland groundwater and the Willamette River can impact porewater assessments. For	Porewater sampling is being conducted to inform remedy design, especially capping and the potential need for the addition of PCB-sequestering amendments. A component of cap design is the migration of PCBs in porewater through the cap from underlying sediment. As stated in the SAP, the design condition for capping would be the period when physical groundwater flow is hypothetically at its maximum and the proposed sampling period provides this condition.	EPA still feels that a follow-on porewater study may be needed during a period of lower differential hydraulic head. Sampling during a period of lower differential hydraulic head

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		example, will a lower differential hydraulic head allow for increased partitioning from the sediments into the porewater, potentially increasing the COC porewater concentration during this time period? Please consider additional sampling events during periods of lower differential hydraulic head between upland groundwater and the Willamette River to assess this possibility of sample bias during a period of high flux.	The late summer period was selected because groundwater flow is reliably toward the river, and there will be a net flux of groundwater to porewater, and porewater to surface water. Collecting porewater under this hydraulic condition will better assist in evaluating impacts of porewater on sediment cap design than would lower flux conditions when there is a lower differential head between upland groundwater and the river. To capture the overall effect of this, we have proposed to keep the samplers in place for a 60-day period to provide a representative measure of the porewater. Additional sampling events are not planned as part of this porewater study.	may capture COC porewater concentrations elevated above those captured during the proposed August-October 2014 sampling event. EPA will determine the need for and timing of a follow-on porewater study following a review of the August-October 2014 porewater sampling data.
G5	General	**Duration of passive sampler deployment and performance reference compounds (PRCs):** Please discuss the potential for using performance reference compounds (which are currently planned for use) to even further reduce deployment time, minimizing the potential for sampler loss. (see also General Comment 2)	As discussed in response to General Comment G2, the RM11E Group is directly addressing the potential for sampler loss in several ways and does not believe that shortening the duration of the deployment is necessary to protect samplers. Further, we do not propose any changes to the duration of deployment of the samplers because the 60-day installation duration should provide more robust results than would a shorter period. A shorter deployment time would not result in sufficient loss of the Performance Reference Compounds (PRC) from the PE to allow an adequate evaluation of equilibrium. The 60-day deployment was recommended by MIT, and is consistent with the deployment period that was used for the Lower Duwamish Waterway (November 2012 – January 2013).	Comment response acknowledged.

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G6	General	**Upstream reference station:** An upstream sampling location is included for the described purpose of providing an upriver measure of dissolved porewater PCBs. Please describe how a sample at this location serves the objectives of the porewater sampling program, which are largely related to meeting the data needs of remedy selection and remedial design.	We will modify the SAP to reflect that the design of the sampling program at RM11E is intended to provide measures of the flux of PCBs within sediments, and a measure of the freely dissolved PCBs that move out of the sediment and into the river. We are principally interested in the in-water portion of the upstream reference station PE. This station (sediment, porewater, and surface water) may provide insight on which PCB congeners are contributed by upstream sources. The in-sediment analytical data from the upstream station should also serve a second function in defining the lower boundaries (lowest PCB congener concentration) for the Two- Carbon Partitioning Model.	Comment response acknowledged.
Specific Comments				
S1	Section 1.1, Purposes and Objectives, Page 1	The purpose of the investigation as defined in this section is overly narrow. Sampling results will presumably inform not only cap design, but also inform a full complement of potential remedial measures. Section 2.1 more appropriately describes how generated data can be used. Please also see the EPA letter dated September 20, 2013 for guidance to address this comment.	We will modify Section 1.1 to reflect the objectives and data uses described in Section 2.1. Also see response to General Comment G1.	Comment response acknowledged.
S2	Section 2.1.2, Inputs to the Model, Pages 4-5	As noted in the text, groundwater seepage will be estimated from hydraulic gradient information generated from the Supplemental Remedial Investigation/Feasibility Study	Groundwater seepage will be evaluated in the Recontamination Assessment and Implementability Study using data collected during the Supplemental RI/FS. Groundwater seepage will be estimated based on a standard approach that uses the hydraulic gradients (i) between upland wells and the Willamette River (taking seasonal variation into account) and an estimated range of hydraulic conductivity values (k) from geologic samples from the shoreline wells and sediments collected in the area. A version of this method (Lampert	During the April 22, 2014 conference call with the RM11E Group, EPA stated its concerns that certain system dynamics important to calculating groundwater seepage could

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		Work Plan groundwater study. Additional site specific information on flux rates may be needed for remedial decisions and design. Please describe why seepage measurements (e.g., UltraSeep) will not be collected during this investigation, preventing a correlation of porewater contaminant concentrations to discharge measurements during the same time period. Please also describe how discharge measurements will be estimated/calculated.	and Reible steady-state model, 2009) was used to evaluate capping in the Portland Harbor FS. Seepage velocity will be calculated by multiplying gradient and hydraulic conductivity. Mass flux will be estimated by multiplying seepage velocity by porewater concentration. Measurement of groundwater seepage velocities to more precisely evaluate contaminant flux rates may be an important consideration in sediment cap design (thickness and amendments); however, collection of empirical seepage data is not warranted at this time for the following reasons: • The distribution of porewater concentrations and location of potential future caps are not known; therefore, targeting placement of individual flux meters would be speculative. • The hydraulic gradient between groundwater and the river is low in the Portland Harbor (lower Willamette Basin), which indicates low seepage velocities and flux rates. Sediment caps at two nearby sites (Zidell and McCormick & Baxter) were designed using estimated flux rates rather than empirical measurements. Finally, we have concerns about the limitation of using seepage meters like the UltraSeep for this level of study. These meters are single point-in-time measures at a limited spatial scale. Use of these meters for evaluating site-wide recontamination and implementability issues is inappropriate for this study.	be "lost to averaging" if these variables were averaged over a long temporal period. EPA also stated its concern that system dynamics that fluctuate daily (e.g., tides) would not be included in seepage estimates. The RM11E Group responded that its intention was to estimate maximum and minimum groundwater seepage, as well as incorporate tidal impacts into their estimates. The Final Porewater SAP should be amended to include this intention. EPA also notes that site specific seepage measurements (e.g., UltraSeep) may be necessary for remedial design.
S3	Section 2.3.2, Porewater Sampling Stations, Pages 7-9	Please indicate the date of the previous sampling events applicable to these porewater and sediment samples, and discuss whether erosion or deposition is likely to have occurred in the intervening period. If erosion or deposition has occurred, does this affect their use in fulfilling project objectives,	The exact sample dates will be added to Table 2-3 of the Porewater SAP for clarity. With the exception of the existing LWG samples LW3-UG02/UC02, which were collected in 2007 and re-occupied by surface sample RM11E-G079 in 2013, the other existing samples were collected as part of the 2009 RM11E Focused Sediment Characterization. While some erosion or deposition has likely occurred, the stations re-occupied during the October 2013 sampling event indicated that there had not been significant changes in concentrations since the 2009 sampling. The porewater SAP was developed to collect data across a wide range of likely conditions at the site, based on information available at the time the	Comment response acknowledged.

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		or will there be more of a reliance on the new sediment results in assessing partitioning from sediment to porewater?	SAP was prepared. Based on the current information there is no reason to believe that sediment characteristics have changed considerably from 2009. Both the past and new sediment data will be used from a preponderance of evidence perspective to evaluate the porewater data.	
S4	Section 2.4, Preliminary Remediation Goals as Design Inputs, Page 9	Please update references to preliminary remediation goals (PRGs) (e.g., Table 2-3, page 9, etc.) to reflect the latest PRG values provided by EPA to the Lower Willamette Group on March 3, 2014	The PRG references will be updated to reflect the March 3, 2014, values as requested.	Comment response acknowledged.
S5	Section 3, Project Organization, Pages 10-12	The following contact information for the EPA Remedial Project Manager should be added to this section for purposes of Field Change Request submittal: Sean Sheldrake, Unit Diving Officer, RPM EPA Region 10, 1200 Sixth Ave., Suite 900	We will add this information and also add Sean's email address, since the Field Change Request will be submitted electronically.	Comment response acknowledged.
S6	Sections 4.3, Navigation and Sample Locating, Page 15	Please discuss the tools and methods used to locate these "older" sediment samples, the tools and methods that will be used to locate the proposed samples, and the need to co-locate these samples with previous sediment sample locations.	We will clarify in the SAP that Appendix C of the RM11E Work Plan describes the navigation procedures to be used in this study, and that the navigation equipment and procedures are consistent with those previously employed for the "older" sediment samples. The 2009 sediment study at RM11E used a dual frequency Trimble GeoXH GPS on the sampling vessel to achieve sub-meter accuracy. The field coordinates were submitted to DOF and post-processed using a subscription service to increase location precision. In the few instances when coordinates either were not collected or there was insufficient satellite coverage or geometry for the Trimble GeoXH GPS receiver, the coordinates simultaneously collected by the vessel operator (± 1m) were utilized.	Comment response acknowledged.
S7	Section 4.4, Field Porewater Reconnaissance Survey,	Please discuss the need to collect both surface and subsurface sediment samples if sampling locations have to be moved because of	Based on the changes made to the passive sampler (see response to General Comment G2), and based on a review of the logs of the prior cores and surface grab samples that were used to select the passive sample locations, we expect we will be able to install the passive sampler wherever the prior surface grabs and cores were successively collected. Consequently, we are not including	EPA conditionally accepts the RM11E Group Response. However, if sampling locations have to be moved to locations that were not

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	Page 15	impediments to passive sampler placement.	new subsurface sediment sampling locations in the Porewater SAP.	previously sampled, model results utilizing non co-located sediment data in conjunction with these porewater results may be questioned.
S8	Section 4.5, Field Deployment and Retrieval Methods, Page 17	Please provide rationale for collecting the sediment core after the PE sampler has been retrieved, as opposed to collecting it immediately before the sampler is retrieved. Please detail what analytical impacts may result from disturbing the sediments by removing the PE sampler prior to core collection.	We will make two clarifying modifications to the SAP and SOP. First, we will modify Section 4.5 of the SAP to provide additional clarity on why the sample is collected at the end of the exposure period. In our discussions with EPA during the April 4, 2014, conference call, we understood that EPA was interested in the possibility of collecting the sediment sampler at the time the PE sampler is deployed instead of when it is retrieved. The goal is to have the sediment sample collected as close as possible to the porewater sampler. In discussions with MIT we decided that collecting a core at the time of deployment would impact the sediment column close to the passive sampler (leaving a hole in the bedded sediment), and thus could compromise the porewater sampler exposure evaluation. For the offshore locations where we will place two passive samplers at each location, we will plan on placing those samplers approximately 8 inches apart, and will take the core from a location between the two samplers. Secondly, regarding the sequence of sediment sampling and PE sampler extraction, we will modify the SAP to state the following sequence at the time of retrieval: locate the PE sampler, set the edge of the sediment core approximately two fingers from the PE sampler, advance the sediment core and leave it in place while the PE sampler is extracted, then retrieve the sediment core.	Comment response acknowledged.
S9	Section 4.5, Field Deployment and Retrieval Methods, Pages 17	Although mentioned in the Attachment 3 SOP, please also state in Section 4.5 that the sediment interval within the core tube will be measured and recorded immediately after retrieval upon the sampling vessel.	The requested text will be incorporated into the Final Porewater SAP.	Comment response acknowledged.

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S10	Section 4.5, Field Deployment and Retrieval Methods, Pages 17	Although stated in Section 4.7, please also state in Section 4.5 that cores will be extruded and logged, including the notation of stratigraphic features. Please also state that the core will need to be inserted and collected in a fashion that preserves this stratigraphy, and that this need will be communicated to the divers. The rational for how the cores are to be collected should also be added to the Attachment 3 SOP.	The requested text and additional explanation will be incorporated into the Final Porewater SAP, including the Attachment 3 SOP.	Comment response acknowledged.
S11	Section 4.6, Post-Processing PE Samplers, Page 18	A sample of the laboratory-grade water used to prevent sample dehydration should also be analyzed for the same analytes as the passive samplers.	The laboratory-grade water is also the method-blank water which will be analyzed for the same analytes as the passive samplers.	Comment response acknowledged.
S12	Section 4.7, Sediment Core Sample Processing, Page 18	For clarity during sample processing, please provide clarification as to what constitutes "visible uniformity" while mixing sediments; i.e., will "visible uniformity" be determined by distribution of grain size, sediment color, etc.?	The SAP will be modified to reflect that visible uniformity means a homogenous mixture of color, texture, density, and particle density and is free of any clay clasts.	Comment response acknowledged.
S13	Section 5.2, Porewater Samplers, Pages 20-21	Please list any expected deviations during passive sampler analysis from the Massachusetts Institutes of Technology (MIT)-.developed standard operating procedures. Please also state that any deviations from these	Section 5.2 states that the analytical methods will generally follow those in the MIT-SOPs. While cited, those are not intended to be specific SOPs for this project. We will modify the SAP text to state that the methods are substantively similar, with some differences as noted in the SAP. Additional clarification for consideration (but not for inclusion in the SAP) is below. • Preparation of the PED (Gschwend et al., 2012a). This document covers the procedures for cleaning and preparing the PE, the methods	Comment response acknowledged.

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		procedures will be documented.	and which PRCs will be loaded onto the PE, and the sampler construction. ALS is in the process of developing their own SOP for the addition and analysis of PRCs to the PE; that has not yet been finalized. However, as noted currently in the SAP, the differences from the MIT procedure are in the size of the PE to be labelled (10 x 30 cm), and that ALS proposes to use different deuterated PRCs, recovery and injection standards than are used by MIT (Table 5-1). We are planning to add text and figures to show the sampler that will be used (which is modified from MIT's basic design), as noted in response to General Comment 2, above. • Deployment of the PED (Gschwend et al., 2012b). That MIT-SOP was used to develop the deployment and retrieval methods described in the RM11E SAP and in the SOP for Diver-Placement and Retrieval of Passive Samplers and Co-located Sediment Samples (Attachment 3). • PE Analysis (Gschwend et al., 2012c). This is replaced in its entirety for ALS EPA Method 1668C (high resolution GC/MS) for PCB analyses (Attachment 5 to the SAP). MIT uses a low resolution GCMS method. The lower ALS reporting limits are listed in Table 5-2, and the ALS SOP for Method 1668C is provided. Significant deviations from the procedures defined in the SAP and the SOP will be documented in the Porewater Characterization Report.	
S14	Table 2-1	The flux of contaminants from subsurface sediments into surface sediments is an important element in assessing contaminant flux, and is a model input identified in Table 2-1. Collection of subsurface porewater and sediment samples (>30 cm) is not proposed. There appears to be a reliance on previous subsurface sampling results in assessing flux from deeper sediments to the surface	The comment refers principally to interpretation of the data, which will be included in the Recontamination Assessment and Implementability Study Reports. Table 2-1 identifies the flux of subsurface PCBs to surface sediments as a data need. For this study, the flux of subsurface PCBs will be considered as follows: • Evaluate the porewater data for evidence of advective or diffusive flux (see below). • Develop the Two-Carbon Partitioning Model based on the measured site data as described in the SAP. • Where the passive samplers indicate only diffusive flux, an estimation of the subsurface sediment flux for modeling is not needed. • Where the passive samplers demonstrate exfiltration, apply the site Two-Carbon Partitioning Model to the existing subsurface sediment	During the April 22, 2013 conference call with EPA, the RM11E Group stated that if advective flux is observed, existing subsurface sediment data would be used to calculate subsurface porewater concentrations and as model inputs for subsurface sediment concentrations. This response is acceptable to EPA and this

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		sediments. Please explain how the flux of subsurface contaminants to surface sediments will be quantified for use in models and evaluations including any potential issues regarding the use of previous subsurface sampling results.	PCB data to estimate subsurface porewater concentrations. • Apply the groundwater flow rates as described in response to Specific Comment S2 and the estimated concentration data using the CAPSIM model to evaluate cap design. The passive samplers can indicate PCB flux and groundwater exfiltration in two ways: PCB congeners measured in the PE at concentrations higher than would be predicted from the interrogated surface sediment sampling interval, and loss of PRCs at a greater rate than expected. The passive sampler data can be used to infer whether a station is undergoing advective flux or diffusive flux based upon deviations from the expected adsorption of PCBs to the passive sampler from surface sediments, and the expected loss rates for the PRCs during exposures. Where levels of PCBs measured in the PE are at concentrations greater than would be expected using basic equilibrium partitioning estimation, the inference would be that the source is due to advective flux from the subsurface sediments. For example, at Station RM11E-PW002 the surface PCBs are relatively low (170 µg/kg total Aroclors), but at depth (1.5 m) are high (6,200 µg/kg). Using equilibrium partitioning, we expect that the total porewater concentration of PCBs measured in the surface sediment to be 14 ng/L (within a factor of 3). The EqP-estimated porewater concentration at depth is 490 ng/L. Flux of PCBs from the subsurface would be inferred if the total PE porewater concentrations measured in the surface sediment exceeded 42 ng/L (3x14 ng/L). PRCs are expected to be “lost” from the sampler at specific rates related to their sorption characteristics. PRC losses become less dependent on hydrophobicities when groundwater flushing at nearshore stations carries these compounds away before they can diffuse into the sediment (Gschwend, personal communication). For example, on the Lower Duwamish Waterway approximately 80% of the trichlor PRC PCB congeners were “lost”, while the pentachlor and heptachlor PRCs were approximately 50% and 20% lost, respectively. Where PRC loss is greater than would be expected, the inference will be that the loss is due to groundwater exfiltration. We do not expect any significant issues from using the existing subsurface sediment data as described above for this FS-level analysis.	understanding should be incorporated into the Final Porewater SAP.

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			See also response to Specific Question S2.	
S15	Table 2-2 and Figure 2-2	This table indicates that samples RM11E-PW002, RM11E-PW003, and RM11E-PW006 will be located in the engineered cap zone. Figure 2-2 shows these same samples in/adjacent to the "In-Situ Treatment Area", but outside of the "Engineered Cap Zone". Please revise the table text appropriately.	Clarifying language will be incorporated into the Final Porewater SAP as requested.	Comment response acknowledged.
S16	Table 4-4	Sediment samples (0 to 30 cm) are proposed for PCB and sediment "conventionals" analyses. Please describe in an appropriate location in the text how any significant variations between "new" sediment results and those from previous sampling efforts will be addressed, particularly in interpreting porewater concentration results.	See response to Specific Question S3. The determination of porewater partitioning parameters would be primarily based on the porewater results measured by the PE sampler and the immediately adjacent sediment concentrations as measured from the sediment samples collected at the time of retrieval of the PE sampler. Variations between the "new" and previous sample results would be addressed in the Recontamination Assessment and Implementability Study Reports in concert with all the additional data being collected for sediment, soil, and groundwater.	Comment response acknowledged.
Specific Comments on Attachment 3 (the Diver SOP)				
S17	Attachment 3 SOP, Section 6	Please state that either: a.) the entire Section 6 will be read through each morning at the start of the dive operation to ensure diver familiarity with specific procedures, or b.) a separate, concise attachment will be prepared for use during the daily dive briefing to ensure a high level of sample quality control.	The SOP will be modified to state that the relevant portions of the SOP to that day's operation will be reviewed at the start of each day's dive operations.	Comment response acknowledged.

EPA Comment No.	Reference Section	EPA Comment Text	RM11E Group Response to EPA	EPA Response
S18	Attachment 3 SOP, Section 6-7, page 5 of 10	Please add the following language: "If the diver notes any rips or tears in the PE membrane before or during insertion, sample deployment must be aborted and a new sampler obtained in order to proceed." (*The current phrasing only references inspecting for tears if refusal is encountered*).	The suggested language will be incorporated into the Final Porewater SAP as requested.	Comment response acknowledged.
S19	Attachment 3 SOP, Section 6-11, page 6 of 10	Please note that for Region 10's dive operations, the tag line is typically attached to a point or anchor on shore, versus just being a short submerged line.	Comment noted.	Comment response acknowledged.

References

EPA. 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/guidance.pdf

EPA 2013 Use of Amendments for In Situ Remediation at Superfund Sediment Sites OSWER Directive 9200.2-128FS April 2013 Office of Superfund Remediation and Technology Innovation
http://www.epa.gov/superfund/health/conmedia/sediment/pdfs/In_situ_AmendmentReportandAppendix_FinalApril2013.pdf

Gschwend P., J. MacFarlane, K. Palaia, S. Reichenbacher, and D. Gouveia. 2012a. Passive PE Sampling in Support of In Situ Remediation of Contaminated Sediments: Standard Operating Procedure for PED Preparation. ESTCP Project ER-200915.ESTCP Project ER-200915. December 2012.

Gschwend P., J. MacFarlane, K. Palaia, S. Reichenbacher, and D. Gouveia. 2012b. Passive PE Sampling in Support of In Situ Remediation of Contaminated Sediments: Standard Operating Procedure for PED Deployment. ESTCP Project ER-200915.ESTCP Project ER-200915. December 2012.

Gschwend P., J. MacFarlane, K. Palaia, S. Reichenbacher, and D. Gouveia. 2012c. Passive PE Sampling in Support of In Situ Remediation of Contaminated Sediments:

Standard Operating Procedure for PE Analysis. ESTCP Project ER-200915. December 2012. GSI. 2013. River Mile 11 East Supplemental Data Report: Archived Bank Soil and

Sediment RE-Analysis. Prepared for the City of Portland Bureau of Environmental Services. Prepared by GSI Water Solutions, Inc. April, 2013.

Lampert, D. J. and D. Reible. 2009. An Analytical Modeling Approach for Evaluation of Capping of Contaminated Sediments. Soil and Sediment Contamination: An International Journal, 18:4, 470-488.

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

825 NE Multnomah, 1500 LCT
Portland, OR 97232
phone (503) 813-5036

April 29, 2014

Via E-Mail

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-115
Seattle, WA 98101
Sheldrake.sean@epa.gov

Re: Supplemental RI/FS Work at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
Delivery of the Final Porewater Sampling and Analysis Plan

Dear Mr. Sheldrake:

The River Mile (RM) 11E Group is in receipt of your letter dated April 25, 2014 regarding the U.S. Environmental Protection Agency's (EPA's) review of the RM11E Group's April 17, 2014 response to EPA's April 3, 2014 comments on the RM11E Supplemental RI/FS Draft Porewater Sampling and Analysis Plan (SAP). In its April 25, 2014 letter, EPA requested that the RM11E Group provide the Agency with a delivery date for the Final Porewater SAP within 3 business days of receipt of the April 25, 2014 letter. After discussing the delivery date with our consulting team today, the RM11E Group will submit the Final Porewater SAP to EPA no later than Friday, May 23, 2014. This will give the Group enough time to update the report to reflect comments provided by EPA on the draft Porewater SAP and to incorporate any adjustments to the porewater sampling approach that are identified during the Field Porewater Reconnaissance Survey being conducted on May 2, 2014.

Please do not hesitate to contact me if you have any questions.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

ec: River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand

Libby Smith

From: Sheldrake, Sean <sheldrake.sean@epa.gov>
Sent: Wednesday, April 30, 2014 1:21 PM
To: (Jackie.Wetzsteon@pacificorp.com); Bill Ford (WFord@LATHROPGAGE.COM); Dave Livesay; Erin Carroll Hughes; Jeff Groy (Jeff.Groy@cbs.com); Kim Cox (Kim.Cox@portlandoregon.gov); Matt Wells (wells@tmw-law.com); Nanci Klinger (N.Klinger@portlandoregon.gov); Paul Fuglevand
Cc: Alex Liverman (liverman.alex@deq.state.or.us); allenmc@cdm.com; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; Conley, Alanna; Cora, Lori; cunninghame@gorge.net; Dan Hafley (HAFLEY.Dan@deq.state.or.us); erin.madden@gmail.com; Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle (Genevieve.Angle@noaa.gov); Gustavson, Karl; Holly Partridge (Holly.Partridge@grandronde.org); jd@williamsjohnsonlaw.com; Jen Kassakian (jkassakian@indecon.com); Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; Kristin Callahan; Koch, Kristine; Lance Peterson (PetersonLE@cdmsmith.com); matt@williamsjohnsonlaw.com; mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; Muza, Richard; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; Rachel DelVecchio (rdelvecchio@indecon.com); Robert.Neely@noaa.gov; rose@yakamafish-nsn.gov; Susan Penoyar (PenoyarSJ@cdmsmith.com); ted_buerger@fws.gov; tomd@ctsi.nsn.us; Tom Gainer (gainer.tom@deq.state.or.us)
Subject: FW: River Mile 11E Updates on the Draft Porewater SAP and the Diver Assisted Sampling Program
Attachments: Delivery Date for Final Porewater SAP Submittal 4 29 2014.pdf

Jackie, EPA accepts the May 23rd delivery date the group has proposed. Thank you.

S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900
Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Tuesday, April 29, 2014 3:25 PM
To: undisclosed-recipients
Subject: RE: River Mile 11E Updates on the Draft Porewater SAP and the Diver Assisted Sampling Program

Hi Sean - Thank you for your letter of April 25, 2014 and the table of EPA's position on the comment responses. As requested in your letter of April 25, 2014 and outlined in the attached letter, the RM11E Group will deliver the Final Porewater SAP to EPA no later than May 23, 2014.

PACIFICORP
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825 NE Multnomah, 1500 LCT
Portland, OR 97232
phone (503) 813-5036

May 22, 2014

Via E-Mail

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-115
Seattle, WA 98101
Sheldrake.sean@epa.gov

Re: Supplemental RI/FS Work at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
Transmittal of the Final Porewater Sampling and Analysis Plan

Dear Mr. Sheldrake:

Attached for your review and approval is the Final Porewater Sampling and Analysis Plan (SAP) for the River Mile 11E Project Area. The Final SAP addresses the final round of comments that the U.S. Environmental Protection Agency (EPA) transmitted to the River Mile (RM) 11E on April 25, 2014. To assist with the review of the document, we have attached a copy of the comment table that EPA and the RM11E Group have been exchanging that denotes (in red) where the SAP has been updated to address each of EPA's comments.

Please do not hesitate to contact me if you have any questions.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

ec: River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand

Libby Smith

From: Sheldrake, Sean <sheldrake.sean@epa.gov>
Sent: Sunday, June 01, 2014 1:23 PM
To: (Jackie.Wetzsteon@pacificorp.com); Bill Ford (WFord@LATHROPGAGE.COM); Dave Livesay; Erin Carroll Hughes; Jeff Groy (Jeff.Groy@cbs.com); Kim Cox (Kim.Cox@portlandoregon.gov); Matt Wells (wells@tmw-law.com); Nanci Klinger (N.Klinger@portlandoregon.gov); Paul Fuglevand
Cc: Alex Liverman (liverman.alex@deq.state.or.us); allenmc@cdm.com; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; Conley, Alanna; Cora, Lori; cunninghame@gorge.net; Dan Hafley (HAFLEY.Dan@deq.state.or.us); erin.madden@gmail.com; Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle (Genevieve.Angle@noaa.gov); Gustavson, Karl; Holly Partridge (Holly.Partridge@grandronde.org); jd@williamsjohnsonlaw.com; Jen Kassakian (jkassakian@indecon.com); Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; Kristin Callahan; Koch, Kristine; Lance Peterson (PetersonLE@cdmsmith.com); matt@williamsjohnsonlaw.com; mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; Muza, Richard; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; Rachel DelVecchio (rdelvecchio@indecon.com); Robert.Neely@noaa.gov; rose@yakamafish-nsn.gov; Susan Penoyar (PenoyarSJ@cdmsmith.com); ted_buerger@fws.gov; tomd@ctsi.nsn.us; Tom Gainer (gainer.tom@deq.state.or.us)
Subject: FW: Transmittal of Final Porewater SAP
Attachments: Porewater SAP Comment Table with Denotations.pdf

Jackie,

This revised SAP is approved. As the enclosed schedule is of a general nature, specific deployment dates, retrieval dates, and data submittal dates will be required to be submitted to EPA at least 30 days before deployment for review and approval.

Thank you.

S

Sean Sheldrake, Unit Diving Officer, RPM
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206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

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From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Wednesday, May 21, 2014 10:28 PM
To: undisclosed-recipients
Subject: Transmittal of Final Porewater SAP

From:	Erin Carroll Hughes
To:	Libby Smith
Subject:	FW: RM11E Diver HSP Update for Porewater Sampling
Date:	Tuesday, July 01, 2014 1:37:55 PM

Agency Communication

From: Paul Fuglevand [mailto:pfuglevand@dofnw.com]
Sent: Tuesday, June 24, 2014 11:16 AM
To: 'Sheldrake, Sean'; PetersonLE@cdmsmith.com
Cc: 'Wetzsteon, Jackie'; 'Matt Wells'; 'Jeff Dresser'; 'Till, Dustin'; 'Dent, Kathleen'; 'Kim Cox'; 'Nanci Klinger'; 'Jan Betz'; 'Dawn Sanders'; 'Russ P Cepko'; 'Jeff Groy'; 'Kathryn R. Huibregtse'; jconder@environcorp.com; 'Bill Ford, (LG)'; 'Denis M Roznowski'; 'Michelle Rosenthal'; 'Bryan Wigginton'; 'Rick Ernst'; 'KIRK WILKINSON'; Dave Livesay; Erin Carroll Hughes; 'Tim Thompson'; 'Alex Liverman'; 'Allen, Elizabeth'; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; coffeyse@cdm.com; 'Conley, Alanna'; 'Cora, Lori'; cunninghame@gorge.net; 'Dan Hafley'; erin.madden@gmail.com; 'Fuentes, Rene'; 'Gail Fricano'; 'Genevieve Angle - NOAA-NMFS'; 'Gustavson, Karl'; 'Holly Partridge'; jd@williamsjohnsonlaw.com; 'Jen Kassakian'; Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; 'Kristin Callahan'; 'Koch, Kristine'; 'Lance Peterson'; matt@williamsjohnsonlaw.com; mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; 'Muza, Richard'; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; 'Rachel DelVecchio'; Robert.Neely@noaa.gov; rose@yakamafish-nsn.gov; 'Susan Penoyar'; ted_buerger@fws.gov; tomd@ctsi.nsn.us; 'Tom Gainer'
Subject: RE: RM11E Diver HSP Update for Porewater Sampling

Sean, thank you for your review of the Ballard Marine HSP update. The final version of the document will spell out LOTO (lock out tag out) and provide an update of the anticipated installation and retrieval schedule.

Regarding the porewater schedule, Tim Thompson is working with ALS and MIT on the PRC loading of the films. ALS is now projecting that the films will be ready in August. Based on the current ship schedules for August we have updated the installation date for the passive samplers to **August 18th +/- 3 days** subject to actual ship arrival and departure dates. We are also projecting retrieval of the samplers and collection of sediment samples on **October 18th +/- 3 days** subject to actual ship arrival and departure dates. We will continue to coordinate the dates for installation and retrieval with you per the AOC requirements.

Feel free to contact me with any questions about the porewater program.

Paul Fuglevand
Dalton, Olmsted & Fuglevand, Inc.
10827 NE 68th Street, Suite B
Kirkland, WA 98033
Phone 425 827-4588
Cell 206 660-3079

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From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Monday, June 23, 2014 9:54 AM
To: pfuglevand@dofnw.com; PetersonLE@cdmsmith.com
Cc: 'Wetzsteon, Jackie'; 'Matt Wells'; 'Jeff Dresser'; 'Till, Dustin'; 'Dent, Kathleen'; 'Kim Cox'; 'Nanci Klinger'; 'Jan Betz'; 'Dawn Sanders'; 'Russ P Cepko'; 'Jeff Groy'; 'Kathryn R. Huibregtse'; jconder@environcorp.com; 'Bill Ford, (LG)'; 'Denis M Roznowski'; 'Michelle Rosenthal'; 'Bryan Wigginton'; 'Rick Ernst'; 'KIRK WILKINSON'; 'Dave Livesay'; 'Erin Carroll Hughes'; 'Tim Thompson'; Alex Liverman (liverman.alex@deq.state.or.us); Allen, Elizabeth; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; coffeyse@cdm.com; Conley, Alanna; Cora, Lori; cunninghame@gorge.net; Dan Hafley (HAFLEY.Dan@deq.state.or.us); erin.madden@gmail.com; Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle - NOAA-NMFS (Genevieve.Angle@noaa.gov); Gustavson, Karl; Holly Partridge (Holly.Partridge@grandronde.org); jd@williamsjohnsonlaw.com; Jen Kassakian (jkassakian@indecon.com); Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; Kristin Callahan; Koch, Kristine; Lance Peterson (PetersonLE@cdmsmith.com); matt@williamsjohnsonlaw.com; mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; Muza, Richard; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; Rachel DelVecchio (rdelvecchio@indecon.com); Robert.Neely@noaa.gov; rose@yakamafish-nsn.gov; Susan Penoyar (PenoyarSJ@cdmsmith.com); ted_buerger@fws.gov; tomd@ctsi.nsn.us; Tom Gainer (gainer.tom@deq.state.or.us)
Subject: RE: RM11E Diver HSP Update for Porewater Sampling

Paul,

EPA has no significant comments on the revised HASP. The final should be revised to spell out LOTO (lock out tag out).

This proposed schedule is approved. As a reminder, both field mobilizations are subject to AOC required notification requirements.

Thank you.

S

Sean Sheldrake, Unit Diving Officer, RPM
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Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Paul Fuglevand [mailto:pfuglevand@dofnw.com]
Sent: Friday, June 20, 2014 5:24 PM
To: Sheldrake, Sean; PetersonLE@cdmsmith.com
Cc: 'Wetzsteon, Jackie'; 'Matt Wells'; 'Jeff Dresser'; 'Till, Dustin'; 'Dent, Kathleen'; 'Kim Cox'; 'Nanci Klinger'; 'Jan Betz'; 'Dawn Sanders'; 'Russ P Cepko'; 'Jeff Groy'; 'Kathryn R. Huibregtse'; jconder@environcorp.com; 'Bill Ford, (LG)'; 'Denis M Roznowski'; 'Michelle Rosenthal'; 'Bryan

From:	Erin Carroll Hughes
To:	Sean Sheldrake (sheldrake.sean@epa.gov); Lance Peterson (PetersonLE@cdmsmith.com)
Cc:	Bill Ford; Bryan Wigginton; Dave Livesay; Dawn Sanders; Dennis Roznowski; Dustin Till; Erin Carroll Hughes; Jackie Wetzsteon (Jackie.Wetzsteon@PacifiCorp.com); Jan Betz; Jason Conder; Jeff Dresser; Jeff Groy; Kathleen Dent; Kathy Huibregtse; Kim Cox; Kirk Wilkinson; Libby Smith; Mary.Wiencke@PacifiCorp.com; Michelle Rosenthal; nanci.klinger@portlandoregon.gov; Paul Fuglevand; Rick Ernst; Russ Cepko; Tim Thompson; wells@tmw-law.com
Subject:	RM11E Field Change Request 003
Date:	Thursday, August 21, 2014 9:14:16 AM
Attachments:	RM11E FIELD CHANGE REQUEST 003.pdf

Sean and Lance,

On behalf of Paul Fuglevand (DOF) and the RM11E Group I am submitting this Field Change Request to document the modified procedure that allowed for installation of the passive sampler at the upstream reference station (RM11E-PW007) identified in the Final Sampling and Analysis Plan.

Thank you both for your 'real-time' coordination efforts on Monday.

Erin Carroll Hughes, RG
Project Hydrogeologist | GSI Water Solutions, Inc.
direct: 971-200-8528 | cell: 503-927-4553
55 SW Yamhill Street, Suite 300, Portland, OR 97204
www.gsiws.com | bio | echughes@gsiws.com

FIELD CHANGE REQUEST (FCR) FORM
Dalton, Olmsted & Fuglevand, Inc.

Project Name: River Mile 11 East, Supplemental RI/FS Investigation

FCR Number: 003 **FCR Date: August 21, 2014**

Prepared for: Sean Sheldrake, EPA

Summary of Work Completed:

On August 18, 2014, divers from Ballard Marine Construction (BMC) installed the passive porewater samplers at six locations downstream of the Broadway Bridge, in accordance with the RM11E Final Porewater Sampling and Analysis Plan (SEE et al., 2014).

The porewater sampler at the upstream reference station (RM11E-PW007) could not be installed (refusal to penetration) due to the heavily armored and steep nature of the riverbank and gravel/cobble substrate at the base of the slope. After attempting to install the sampler in the immediate vicinity of the target coordinates, the diver expanded his radius to search for a suitable sampling location initially within 10 meters of target, but then up to 20 meters. The diver made multiple attempts to drive the sampler using the methods described in the SAP, but was unsuccessful in finding a suitable location.

At this point, Tim Thompson and Erin Carroll Hughes called Lance Peterson and Sean Sheldrake to determine an alternate plan of action. An approach was verbally approved on August 18th and the final modifications are described below.

Description of Proposed Modification:

As discussed during the call with Sean and Lance, a BMC diver was re-deployed at the target coordinates and instructed to try driving the sampler in again at the target location. When the standard method of driving didn't work, the diver was instructed to remove rocks to create a void in the river bed for sampler installation. The diver was able to advance the sampler approximately 20 cm (of the target 30 cm) beyond the mudline using this technique. Rocks and sediment were then pushed back up against the sampler and two anchor points were put in to secure the sampler. While the porewater sample may not be representative of true "porewater",

the surface water sample will be representative and meet the primary objectives of this "reference station."

Due to dive-time restraints on the third BMC diver, the duplicate sampler was not installed at the upstream reference location (RM11E-PW07).

Reasons for Modification:

The rocky substrate and absence of fine-grained sediment prevented installation of the porewater sampling device as described in the Sampling and Analysis Plan within 30 ft of the target coordinates of the upstream reference station. The modified procedure allowed for the installation of the porewater sampler at the location identified in the Sampling and Analysis Plan to collect incoming surface water concentrations.

Schedule Impacts:

None, all work was completed on August 18, 2014 as anticipated.

Submitted by:

Project Manager: _____ Date:_____August 21, 2014_____

Paul F. Fuglevand

Approved by:

EPA Representative: _____ Date:_____

From: Erin Carroll Hughes
To: Peterson, Lance; Opem, Paul
Cc: Paul Fuglevand (pfuglevand@dofnw.com); tthompsonseellc@gmail.com; Dave Livesay; Libby Smith
Subject: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.
Date: Wednesday, October 15, 2014 5:30:43 PM

Hello, Lance and Paul.

I'm writing to confirm the start time and location for the fieldwork at RM11E next week. We will be meeting at the Swan Island Boat ramp early on Monday morning (October 20th.) We plan to have the boat in the water and materials loaded such that we can kick-off the Health and Safety meeting by 7:30 am.

Paul, can you please plan to arrive at 7:15 am so that you can be present for the H&S meeting? To confirm, you will be bringing your own PFD, correct?

Please feel free to call my cell phone with questions or if anything comes up on Monday morning.

Erin Carroll Hughes, RG
Project Hydrogeologist | GSI Water Solutions, Inc.
direct: 971-200-8528 | cell: 503-927-4553
55 SW Yamhill Street, Suite 300, Portland, OR 97204
www.gsiws.com | bio | echughes@gsiws.com

From: Peterson, Lance [mailto:PetersonLE@cdmsmith.com]
Sent: Thursday, October 09, 2014 1:13 PM
To: Erin Carroll Hughes
Cc: Opem, Paul
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Erin, Paul is copied here.

From: Erin Carroll Hughes [mailto:EcHughes@gsiws.com]
Sent: Thursday, October 09, 2014 11:31 AM
To: Peterson, Lance
Cc: Paul Fuglevand (pfuglevand@dofnw.com); Dave Livesay; Tim Thompson (tthompson@seellc.com)
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Oh, yes. Monday the 20th sorry.

Thanks for Paul's phone number. Can I also get his email from you as well? I think it was just Sean O. and Andy providing oversight before, so look forward to meeting him.

Will be in touch again next week.

Erin Carroll Hughes

From: Peterson, Lance [mailto:PetersonLE@cdmsmith.com]
Sent: Thursday, October 09, 2014 11:27 AM

To: Erin Carroll Hughes
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Thanks Erin, Paul Opem from CDM Smith will be there this time. Paul was at the site for part the sediment sampling I think. Paul's cell is 303 378 5253.

I assume you mean to say Monday October 20th below?

Lance

From: Erin Carroll Hughes [mailto:EcHughes@gsiws.com]
Sent: Thursday, October 09, 2014 11:23 AM
To: Peterson, Lance
Cc: tthompsonseellc@gmail.com; Paul Fuglevand (pfuglevand@dofnw.com); Dave Livesay
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Hi, Lance.

I wanted to let you know that our current plan is to start the H&S meeting at the Swan Island Boat Ramp at 8 am on Monday, October 22nd. We will plan on having everything loaded on the boat and ready to go before the meeting. I can confirm details as the date approaches.

Will Sean Oliveira be providing oversight on behalf of EPA again?

Thanks,

Erin Carroll Hughes

From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Wednesday, October 08, 2014 3:44 PM
To: pfuglevand@dofnw.com; 'Peterson, Lance'
Cc: 'Tim Thompson'; 'Wetzsteon, Jackie'; Dave Livesay; Erin Carroll Hughes
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Thanks for the update Paul. S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
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http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Paul Fuglevand [mailto:pfuglevand@dofnw.com]
Sent: Wednesday, October 08, 2014 2:34 PM
To: Sheldrake, Sean; 'Peterson, Lance'

Cc: 'Tim Thompson'; 'Wetzsteon, Jackie'; 'Dave Livesay'; 'Erin Carroll Hughes'
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Sean,

Per our email exchange last week we are currently scheduled to retrieve the RM11E porewater samplers and collect sediment samples on Monday October 20th, possibly extending into October 21st. We will again be using Ballard Marine Construction for the diving, and they have confirmed their crew for those dates.

One factor we are watching is the schedule for ships at the Glacier and Cargill docks. Based on our most current information, neither Glacier nor Cargill have a vessel scheduled to be at their dock on October 20th. However if weather conditions delay the arrival of vessels planned for either dock, or if rainfall delays the transfer of product at either dock, then the planned sample recovery date could be delayed beyond October 20th for some stations. In that case the diving at those stations would be delayed until conditions were deemed safe by the Ballard dive superintendent, after the vessel had left the dock. Right now I am optimistic that October 20th is going to work for the sample recovery work, but because we can't control the weather we will have to track the actual activity at the docks to see how the events play out.

As we have done before, we will keep you updated on our schedule as it unfolds and if we foresee any changes.

Paul Fuglevand
Dalton, Olmsted & Fuglevand, Inc.
10827 NE 68th Street, Suite B
Kirkland, WA 98033
Phone 425 827-4588
Cell 206 660-3079
This electronic message transmission contains information that may be confidential and/or privileged work product prepared in anticipation of litigation. The information is intended for the use of the individual or entity named above. If you are not the intended recipient, please be aware that any disclosure, copying distribution or use of the contents of this information is prohibited. If you have received this electronic transmission in error, please notify me by telephone at (425) 827-4588, or by electronic mail, pfuglevand@dofnw.com

---

From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Monday, October 06, 2014 12:32 PM
To: pfuglevand@dofnw.com; 'Peterson, Lance'
Cc: Tim Thompson; Wetzsteon, Jackie; Dave Livesay; Erin Carroll Hughes
Subject: RE: RM11E Updated Schedule for retrieval of porewater samplers - October 201 and 21.

Thanks Paul. S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
Seattle, WA 98101
206.553.1220 desk

From: Wetzsteon, Jackie
To: Sean Sheldrake (sheldrake.sean@epa.gov)
Cc: Peterson, Lance; "Betz, Jan"; "Bryan Wigginton"; Dave Livesay; "Denis Roznowski; Ellis Johnson, Kristen M. (LG); Erin Carroll Hughes; "Ford, Bill (LG)"; "Groy, Jeff"; "Jason Conder; "Jeff Dresser"; "Kathryn R. Huibregtse; "Kim.Cox@portlandoregon.gov"; "KIRK.WILKINSON@lw.com"; "Klinger, Nanci"; Libby Smith; "Matt Wells"; "Michelle Rosenthal"; Paul Fuglevand; "Rick Ernst"; "Russ P Cepko; "Sanders, Dawn"; Till, Dustin; Tim Thompson; Wiencke, Mary
Subject: FW: Fwd: RM11E check-in
Date: Tuesday, October 28, 2014 12:22:34 PM

Hi Sean,

Please see the message below from Paul Fuglevand to Lance Peterson regarding the sampling event last week.

Thank you,
Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232
(503) 813 5036 (work)
(503) 961 3955 (cell)

From: Paul Fuglevand [mailto:pfuglevand@dofnw.com]
Sent: Tuesday, October 28, 2014 12:19 PM
To: PetersonLE@cdmsmith.com
Cc: Tim Thompson; Erin Carroll Hughes; Wetzsteon, Jackie
Subject: RE: Fwd: RM11E check-in

Lance,

I have an update on the RM11E porewater sampler recovery program that occurred last week. During the recovery of the single upstream porewater sampler at PW007 (upstream water-only reference station) late in the day on Oct. 20th, it was observed that the stainless steel PE Covers were still in place on the sampler. We proceeded with processing and analysis of that water-column PE sample and will evaluate the data for usability once it is received. Let me know if you have any questions.

Paul Fuglevand
Dalton, Olmsted & Fuglevand, Inc.
10827 NE 68th Street, Suite B
Kirkland, WA 98033
Phone 425 827-4588
Cell 206 660-3079

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From: Paul Fuglevand [mailto:pfuglevand@dofnw.com]
Sent: Tuesday, October 21, 2014 9:50 AM
To: 'PetersonLE@cdmsmith.com'
Cc: Tim Thompson; Erin Carroll Hughes; Wetzsteon, Jackie
Subject: Fwd: RM11E check-in

Lance, we did retrieve all six pairs of co-located porewater samplers and the single sampler at station 7, and we did collect the planned sediment samples. The samples are being processed today by Erin and Tim.

Paul Fuglevand
Dalton, Olmsted & Fuglevand, Inc.
10827 NE 68th Street, Suite B
Kirkland, WA 98033
Phone 425 827-4588
Cell 206 660-3079
This electronic message transmission contains information that may be confidential and/or privileged work product prepared in anticipation of litigation. The information is intended for the use of the individual or entity named above. If you are not the intended recipient, please be aware that any disclosure, copying distribution or use of the contents of this information is prohibited. If you have received this electronic transmission in error, please notify me by telephone at (425) 827-4588, or by electronic mail, pfuglevand@dofnw.com

From: "Peterson, Lance" <PetersonLE@cdmsmith.com>
Date: October 21, 2014 at 9:01:12 AM PDT
To: Erin Carroll Hughes <EcHughes@gsiws.com>
Subject: RM11E check-in

Hi Erin, my voicemail from Paul Opem indicates all the Porewater work was completed yesterday – that good news. Can you confirm that all the co-located samplers at the 7 station locations were successfully retrieved as well at the 7 cores. Thanks.

Lance

==========

Lance E. Peterson, RG, LHG
Senior Project Manager
CDM Smith
14432 SE Eastgate Way, Suite 100, Bellevue, WA 98007
425-519-8300 (office) | 425-519-8382 (direct) | 425-417-5946 (mobile) | 425-746-0197 (fax)
mailto:petersonle@cdmsmith.com | cdmsmith.com

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January 16, 2015

Via E-Mail

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-115
Seattle, WA 98101
Sheldrake.sean@epa.gov

Re: Supplemental RI/FS Work at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
Update on the Status of the Porewater Data and Report Deliverable Schedule

Dear Mr. Sheldrake:

Thank you for meeting with us on January 8, 2015 to discuss the screening process for identifying Recontamination Potential Contaminants. As we discussed during our meeting, the River Mile 11E (RM11E) Group contractors identified significant issues with the validity of data from the polyethylene (PE) and sediment samples analyzed by ALS Environmental (ALS) as part of the RM11E porewater characterization effort. As described in the attached letter from ALS, the laboratory thoroughly reviewed the data and identified laboratory procedures that led to the data issues. In light of these issues, ALS developed a plan for corrective action for re-analysis of the data, and recalled the PE and sediment data packages. ALS is re-extracting and re-analyzing the PE and sediment samples. As outlined in the attached letter, ALS plans to complete the re-analysis of the data by February 14, 2015. At that time, the data will be independently validated.

This data issue will necessarily cause a delay in the preparation of the Draft Porewater Characterization Report. The RM11E Group anticipates transmitting the Draft Porewater Characterization Report to EPA by April 30, 2015 (approximately 60 days after receipt of validated data). We propose keeping the delivery date of the Implementability Study as is, i.e., August 1, 2015. However, in order to accommodate the delay in preparation of the Porewater Characterization Report, and to more efficiently sequence the overall RM11E efforts, we propose de-coupling the due dates for the Implementability Study and Recontamination Assessment by adjusting the delivery date for the Recontamination Assessment by one month, making it due September 1, 2015.

An updated schedule of the remaining deliverables for the RM11E project is attached for your approval.

Please do not hesitate to contact me if you have any questions.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

Attachments:

Schedule of Remaining Project Deliverables for the RM11E Project Area
January 7, 2015 Letter from ALS Environmental re Data Recall

cc: River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand

Schedule of Remaining Project Deliverables for the RM11E Project Area

Activity	Work Product	Schedule
Porewater Characterization Report	Draft Porewater Report	Due to EPA Team: **April 30,2015**
	Final Porewater Report	Due to EPA Team: **30 days after receipt and resolution of EPA Team comments on the draft Porewater Characterization Report (anticipated by August 1, 2015)**
Implementability Study	Draft Implementability Report	Due to EPA Team: **August 1, 2015**
	Final Implementability Report	Due to EPA Team: **30 days after receipt and resolution of EPA Team comments on the draft Implementability Report**
Recontamination Evaluation	Draft Recontamination Assessment Report	Due to EPA Team: **September 1, 2015**
	Final Recontamination Assessment Report	Due to EPA Team: **30 days after receipt and resolution of EPA Team comments on the draft Recontamination Assessment Report**

Updated 1/16/15

1317 South 13th Avenue
Kelso, WA 98626
T: +1 360 577 7222
F: +1 360 636 1068
www.alsglobal.com

January 7, 2015

Tim Thompson
Science and Engineering for the Envrironment, LLC
4401 Latona Ave NE
Seattle, WA 98105

Re: **Data Recall - River Mill 11 East: K1411748 & K1411753**

Dear Tim:

Please be advised that ALS Environmental (ALS) is voluntarily re-calling the data packages submitted for the River Mile 11 East (RM11E): K1411748 & K1411753. ALS acknowledges problems with those data that have been identified in subsequent discussions between SEE, GSI, Pyron Environmental, and our own internal staff here and in Houston. We now do not believe that these data meet the QA/QC requirements for the project, and as a result the sensible course of action is to reject these data and to re-extract and re-analyze the PE and the sediments.

I have summarized information related to the analysis of the samples for the RM11E project and the subsequent recall of the data initially released by ALS. Please note the following:

- **Background & Justification for Recall - Polyethylene Samples**
  - The problems associated with the PE data were threefold: (1) Method Blank contamination; (2) high analyte concentration relative to the concentration of the added internal standards.; and (3) co-extractable material from the PE (after retrieval from the field) became significant after concentrating to 20 uL and negatively impacted the performance of the HRMS instrument.
  - The impact of the combination of Method Blank contamination and relatively low internal standard concentrations was questionable results for the PRCs (particularly in the high level samples), and also created a number of qualifiers for some of the non-PRC congeners.
  - The data was qualified (narrated and flagged) and reported as analyzed, as the impact of the problems relative to the usability of the data were not thoroughly understood at the time of reporting. Note the values analyzed were excessively high as compared to normal levels typically observed when using EPA Method 1668x.
  - After a thorough review of the data by SEE, GSI, and Pyron Environmental, a number of anomalies indicated the results were most likely significantly impacted by the aforementioned problems.
  - Additional investigation was performed by ALS to better understand the potential source(s) of the problems. Specifically, the following items were identified:
    - The source of the Method Blank contamination was narrowed down to the extraction process, potentially coming from airborne PCBs during the concentration

step, as well as potential cross-contamination from non-disposable extraction equipment.
    - The high analyte concentration compared to the relatively low concentration of the added labeled internal standards did not allow for dilution of the extracts.
    - The "209 Congener" standard prescribed by the method to develop response factors for congeners without five-point calibrations was orders of magnitude lower than numerous target compounds.
    - The small final volume in conjunction with the non-target background required fairly aggressive cleanup of the extracts. Note that the non-target background was significantly more prevalent in the field samples than the initial t_o samples, where it was essentially non-existent.
    - Also of note was the fact that the laboratory was attempting to achieve reporting limits approximately 10-20x lower than required by the Sampling and Analysis Plan (SAP). This compounded the issue of the variability in concentrations of the target analytes (i.e. elevated levels versus trace levels).
  - As a result of the lack of usability and in consideration of the various issues surrounding the analysis and the impact on the passive sampling application, ALS Environmental took the initiative to recall the original report, implement modifications to the analytical procedure employed, and agreed to re-analyze archived PE samples.

- **Corrective Actions to be Implemented for Re-analysis - Polyethylene Samples**
  - Samples consisting of high PRC loading will be segregated from samples with low PRC loading during the entire analytical procedure to minimize cross-contamination.
  - Additional decontamination of common laboratory equipment will be implemented as a precautionary step in the process knowing these samples contain concentrations atypical of routine Method 1668x applications.
  - The labeled internal standards will be added at higher concentrations to allow subsequent dilutions as needed to bring high concentration analytes into a reasonable range of the "209 Congener" standard.
  - The "209 Congener" standard will essentially be analyzed at a higher concentration to better coincide with the high concentration analytes.
  - The extraction formulation will be adjusted to produce reporting limits in line with the requirements of the SAP rather than attempting to push the limits too low relative to analyte concentrations.

- **Timeline**
  - The re-analysis of the PE samples as described (above) is expected to be completed by 2/14. As data are available we will send those to SEE for a "quick review" to ensure we are on-track to meet project goals.

- **Background and Justification for Recall - Sediments**
  - The primary question arising from the sediment analysis was related to variability in results between ALS/Kelso (Aroclors only), ALS/Houston, and MIT. Although the lack of precision and/or consistency between the various splits might be related to heterogeneous distribution of PCBs in the sediment samples, a recall of the data was advised in an attempt to more clearly understand the issue.

- Secondary issues of Method Blank contamination and inability to dilute due to low concentration internal standards were also noted for the sediments. As with the PE samples, these were related to high concentration analytes in the presence of trace level analytes.

- **Corrective Actions to be Implemented for Re-analysis**
  - As with the PE samples, some Method Blank contamination was noted, although to a lesser degree than the PE samples. Similar precautionary steps will be implemented as per the PE samples.
  - The labeled internal standards will also be added at higher concentrations to assist with the issue of diluting for high concentration analytes.

- **Timeline**
  - The re-analysis of the sediment samples as described (above) is expected to be completed by 2/14. As data are available we will those to see for a "quick review" to ensure we are on-track to meet the project goals.

As we discussed, these re-extractions and re-analyses will be at ALS' expense.

Please contact me at (360) 501-3316 or jeff.christian@alsglobal.com if you have further questions or comments related to this information.

Sincerely,
ALS Group USA Corp dba ALS Environmental

Jeff Christian
Director of Operations - Western USA

Libby Smith

From: Sheldrake, Sean <sheldrake.sean@epa.gov>
Sent: Tuesday, January 20, 2015 11:49 AM
To: Wetzsteon, Jackie
Cc: (Jackie.Wetzsteon@pacificorp.com); Bill Ford (WFord@LATHROPGAGE.COM); Dave Livesay; Erin Carroll Hughes; Jeff Groy (Jeff.Groy@cbs.com); Kim Cox (Kim.Cox@portlandoregon.gov); Matt Wells (wells@tmw-law.com); Nanci Klinger (N.Klinger@portlandoregon.gov); Paul Fuglevand; Alex Liverman (liverman.alex@deq.state.or.us); Allen, Elizabeth; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; Christopher, Anne; coffeyse@cdm.com; Conley, Alanna; Cora, Lori; cunninghame@gorge.net; Dan Hafley (HAFLEY.Dan@deq.state.or.us); erin.madden@gmail.com; Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle - NOAA-NMFS (Genevieve.Angle@noaa.gov); Gustavson, Karl; Holly Partridge (Holly.Partridge@grandronde.org); jd@williamsjohnsonlaw.com; Jen Kassakian (jkassakian@indecon.com); Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; Kristin Callahan; Koch, Kristine; Lance Peterson (PetersonLE@cdmsmith.com); mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; Muza, Richard; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; Rachel DelVecchio (rdelvecchio@indecon.com); Rita Cabral (rcabral@indecon.com); Robert.Neely@noaa.gov; Robinson, Deborah; rose@yakamafish-nsn.gov; ted_buerger@fws.gov; tomd@ctsi.nsn.us; Tom Gainer (gainer.tom@deq.state.or.us)
Subject: RE: 11E Update on the Status of the Porewater Data and Deliverable Schedule
Attachments: Update on the Status of the Porewater Data and Deliverable Schedule

Hello Jackie,

The attached schedule proposal is approved.

Thank you.

S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Friday, January 16, 2015 8:12 AM
To: Sheldrake, Sean
Subject: Update on the Status of the Porewater Data and Deliverable Schedule

Hi Sean,

Attached for your review is an update on the status of the porewater data for the RM11E Project Area as well as a data recall letter from ALS and an update to the deliverables schedule.

Please do not hesitate to call me if you have any questions.

Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232
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(503) 961 3955 (cell)

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March 31, 2015

Via E-Mail

Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
M/S ECL-115
Seattle, WA 98101
Sheldrake.sean@epa.gov

Re: Supplemental RI/FS Work at the River Mile 11E Project Area
Portland Harbor Superfund Site (PHSS)
Request for Extension on the Draft Porewater Characterization Report Deliverable

Dear Mr. Sheldrake:

As a follow-up to our letter dated January 16, 2015 (attached), the RM11E Group is providing you with an update on the status of the porewater data and report deliverable. As noted in the February 2015 monthly report, ALS Environmental was late in getting the unvalidated data to the RM11E Group and we did not receive the completed unvalidated data packages until March 11, 2015. This is three and a half weeks after the anticipated February 14, 2015 date that was mentioned in the attached letter.

To accommodate the delay in the receipt of the unvalidated data and allow enough time for third party data validation and preparation of a quality work product, the RM11E Group is requesting a three week schedule extension on the Draft Porewater Characterization Report. The draft report will be submitted to EPA by Thursday May 21, 2015.

Please do not hesitate to contact me if you have any questions or concerns.

Sincerely yours,

Jacqueline Thiell Wetzsteon
RM11E Project Coordinator

Enclosure

Cc (via email):
River Mile 11E Respondents
AOC Notice Recipients (Paragraph 97.c through m)
Paul Fuglevand

Libby Smith

Subject: Update on Schedule for Submission of the Draft Porewater Characterization Report
Attachments: Request for Extension on Porewater Characterization Report 3 31 15 SF.pdf

From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Wednesday, April 01, 2015 8:32 AM
To: (Jackie.Wetzsteon@pacificorp.com); Bill Ford (WFord@LATHROPGAGE.COM); Dave Livesay; Erin Carroll Hughes; Jeff Groy (Jeff.Groy@cbs.com); Kim Cox (Kim.Cox@portlandoregon.gov); Matt Wells (wells@tmw-law.com); Nanci Klinger (N.Klinger@portlandoregon.gov); Paul Fuglevand
Cc: Alex Liverman (liverman.alex@deq.state.or.us); Allen, Elizabeth; audiehuber@ctuir.com; bayuk.dana@deq.state.or.us; schwarz.bob@deq.state.or.us; bob@ridolfi.com; callie@ridolfi.com; Christopher, Anne; coffeyse@cdm.com; Conley, Alanna; Cora, Lori; Courtney Johnson (courtney@crag.org); cunninghame@gorge.net; Dan Hafley (HAFLEY.Dan@deq.state.or.us); Charters, David; erin.madden@gmail.com; Fuentes, Rene; Gail Fricano (gfricano@indecon.com); Genevieve Angle - NOAA-NMFS (Genevieve.Angle@noaa.gov); Gustavson, Karl; Holly Partridge (Holly.Partridge@grandronde.org); jd@williamsjohnsonlaw.com; Jen Kassakian (jkassakian@indecon.com); Jeremy_Buck@fws.gov; johnson.keith@deq.state.or.us; jweis@hk-law.com; KingTW@cdmsmith.com; Kristin Callahan; Koch, Kristine; Lance Peterson (PetersonLE@cdmsmith.com); mcclincy.matt@deq.state.or.us; tosm@yakamafish-nsn.gov; Michael.karnosh@grandronde.org; Muza, Richard; nancy.munn@noaa.gov; peterson.Jennifer@deq.state.or.us; poulsen.mike@deq.state.or.us; Rachel DelVecchio (rdelvecchio@indecon.com); Rita Cabral (rcabral@indecon.com); Robert.Neely@noaa.gov; Robinson, Deborah; rose@yakamafish-nsn.gov; ted_buerger@fws.gov; tomd@ctsi.nsn.us; Tom Gainer (gainer.tom@deq.state.or.us)
Subject: FW: Update on Schedule for Submission of the Draft Porewater Characterization Report

Jackie,

Thank you for the attached request. Your request is approved; let me know if you have any questions or concerns.

S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

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From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Tuesday, March 31, 2015 3:13 PM
To: undisclosed-recipients
Subject: Update on Schedule for Submission of the Draft Porewater Characterization Report

Hi Sean,

Attached is a request for an extension to the deadline for the submission of the draft Porewater Characterization Report from April 30, 2015 to May 21, 2015 due to the delay in the receipt of analytical results from ALS Environmental.

Call me if you have questions,
Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232
(503) 813 5036 (work)
(503) 961 3955 (cell)

Libby Smith

Subject: FW: Delay in the Transmittal of the Draft Porewater Characterization Report

From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Thursday, May 21, 2015 4:04 PM
To: Wetzsteon, Jackie
Cc: Lance Peterson (PetersonLE@cdmsmith.com)
Subject: RE: Delay in the Transmittal of the Draft Porewater Characterization Report

Jackie, Thank you for that update. A delay of up to 10 days for report submittal is approved.

S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Thursday, May 21, 2015 3:47 PM
To: undisclosed-recipients
Subject: Delay in the Transmittal of the Draft Porewater Characterization Report

Hi Sean,

As the River Mile 11E Group was packaging up the Draft Porewater Characterization Report to deliver to you today, we identified a few issues in the estimated porewater concentrations. We are currently working with MIT to resolve them and hope to be able to submit the report to you within the next 10 days. We will have a better idea of where we stand as of next Tuesday and will get back to you with a firm deadline for submission of the report. Thank you for your patience. I truly apologize for the delay.

Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
825 NE Multnomah, LCT 1500
Portland, OR 97232
(503) 813 5036 (work)
(503) 961 3955 (cell)

Libby Smith

Subject: FW: Porewater Update

From: Sheldrake, Sean [mailto:sheldrake.sean@epa.gov]
Sent: Monday, June 01, 2015 9:26 AM
To: Wetzsteon, Jackie
Cc: Lance Peterson (PetersonLE@cdmsmith.com)
Subject: RE: Porewater Update

Thanks Jackie, this schedule change request is approved. S

Sean Sheldrake, Unit Diving Officer, RPM
EPA Region 10, 1200 Sixth Ave., Suite 900; Mailstop DOC-01
Seattle, WA 98101
206.553.1220 desk
206.225.6528 cell
http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor
http://www.epa.gov/region10/dive/

Like us on Facebook! https://www.facebook.com/EPADivers

From: Wetzsteon, Jackie [mailto:Jackie.Wetzsteon@pacificorp.com]
Sent: Monday, June 01, 2015 8:13 AM
To: undisclosed-recipients
Subject: Porewater Update

Hi Sean,

As a follow-up to our phone conversation on Friday, May 29, 2015, the River Mile 11E Group will submit the draft Porewater Characterization Report to EPA no later than Friday, June 12, 2015.

Thank you for working with us on this matter.
Jackie

Jackie Wetzsteon
PacifiCorp
Strategic Policy and Environment
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(503) 961 3955 (cell)

Appendix B

Passive Sampler Loading Report

ACTIVITY REPORT

Report # **1: Sample Loading** **DATE** **August 17, 2014** ***S*** M T W TH F S

Field Investigation Manager: **Tim Thompson**

Location: At ALS Laboratory, Kelso, WA

TASK: ☐ Industrial Area Soils ☐ Industrial Area Groundwater ☑ Porewater ☐Sediment ☐ MIS

SUBCONTRACTORS/VISITORS ON SITE: AT ALS in Kelso. Tim Thompson SEE, Rich May DOF.

EQUIPMENT ON SITE: Passive sampling frames

WORK PERFORMED (INCLUDE ANY SAMPLES COLLECTED):

- **On Site at ALS (0900)** Lab health and safety briefing.
- **Prepared 14 passive samplers** (PW001 – PW007, A and B each).
- **Wrapped and Labelled Samplers.** Each sampler individually labelled, wrapped in foil, then wrapped in plastic and placed in ice chest with ice for transport
- **Submitted PRC Samples for Analysis.** Prepared laboratory both low-level and high-level PCB samples to measure Performance Reference Compounds for each PE sheet placed in a sampler. The "A" samples were indicated for analysis. The "B" samples were archived.

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS)

- None necessary

HEALTH AND SAFETY LEVELS AND ACTIVITIES: **Tailgate Meeting Held ☑**

- H&S briefing conducted with ALS staff.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- During the loading process when a sheet was torn, it was immediately replaced by a second PE sheet. The PRC solution (high/low load and the PRC Load I.D.) were recorded and are given in Table 2.

SPECIAL NOTES:

- Samplers wrapped in foil and plastic, placed in ice chest with ice for overnight transport to RM11E. PE Samplers remained in the custody of SEE at all times.
- Additional PRC-labelled sheets in solution were carried to the site in the advent that a rip occurred onsite and the sheet had to be replaced.

TOMORROW'S EXPECTATIONS:

- Place samplers in sediment per SAP.

ATTACHMENTS:

- Loading and Assembly of Polyethylene Passive Samplers
- Chain-of-Custody for Initial PRC Loaded PE

PREPARED BY: Tim Thompson

SIGNATURE: Filed electronically.

Loading and Assembly of Polyethylene Passive Samplers

Polyethylene passive samplers were impregnated with the Performance Reference Compounds (PRCs) at ALS's laboratory at Kelso, Washington, and mounted into the sampling frame prior to deployment. Passive samplers were pre-loaded with the PCB PRCs following ALS' *SOP for Preparing Polyethylene (PE) Passive Samplers and PCB Congener Performance Reference Compounds Loading* (Attachment 5 to the Work Plan). One difference from the ALS-SOP is that the PE/PRC loading solutions were placed on a shaker table to ensure adequate mixing and exposure of the PE. A total of 20 jars of PRC with 15 x 70 cm polyethylene strips were prepared by ALS. While the exposure in the sampling frames is 10 x 50 cm, a larger piece was labelled with PRCs in order to fit into the frame, and to allow for an additional 15 x 20 cm of trim to be analyzed for the initial PRC-loading.

The process for loading the PE into the frames is shown in Figure 1. Two sets of PRC solutions were used, designated as "high" and "low". The PRCs loading was matched to the anticipated PCB porewater concentration based on the previously measured total PCBs in sediments (Table 1). The sample location, sampler frames, the PRC loading identification, and the sample id were recorded in the field book (Table 2). The PRC-labelled polyethylene sheet was laid out across the sampler frame (A), and trimmed to the frame. The approximately 15 x 20 cm trim piece is placed into a sample jar for analysis. The second frame is matched to the first (B, C); both frames have a number that is recorded in the lab notebook. The frames are then fixed together using stainless steel washers and bolts (D, E). The assembled frames are then double-wrapped in aluminum foil (F), fixed with a label (G), wrapped in plastic and then placed in an ice chest for holding and transport to the field.

All initial PRC-labelled samples were placed in labelled jars. The chain-of-custody is attached.

Table 1. Porewater station and designated "high"/"low" PRC loading based on estimated porewater concentration from previously measured sediment Aroclor concentration.

Porewater Station	Sediment Station	Measured Total Aroclor (µg/kg)	Estimated Max PW Congener Concentration (ng/L)	PRC Loading Designation
PW003	G026	1400	25.10	High
PW006	G033	2000	105.04	High
PW001	UG02	5900	341.22	High
PW002	G022	133	1.61	Low
PW004	G027	133	4.83	Low
PW005	G028	373	4.18	Low

Table 2. Sampler identification recorded at the laboratory.

Porewater Station	PRC Loading Designation	Sampler	Sampler Frames	PRC Load ID	Sample ID
PW001	High	A	A0, A1	062314-H1	PW001 A T_0
		B	A2,A4	062314-H2	PW001 B T_0
PW002	Low	A	A5, A6	062314-L1	PW002 A T_0
		B	A7, A8	062314-L2	PW002 B T_0
PW003	High	A	A9, A10	062314-H4	PW003 A T_0
		B	A11, A12	062314-H5	PW003 B T_0
PW004	Low	A	A13, A14	062314-L3	PW004 A T_0
		B	A15, A16	062314-L4	PW004 B T_0
PW005	Low	A	A17, A18	062314-L5	PW005 A T_0
		B	A19, A20	062314-L6	PW005 B T_0
PW006	High	A	A21, A22	062314-H6	PW006 A T_0
		B	A23, A24	062314-H7	PW006 B T_0
PW007	Low	A	A25, A26	062314-L7	PW007 A T_0
		B	A27, A28	062314-L8	PW007 B T_0

Figure 1. Porewater sampler preparation.

Appendix C

Passive Sampler Deployment Report

DAILY ACTIVITY REPORT

Report # **2: Sampler Deployment** **DATE** **August 18, 2014** S ***M*** T W TH F S

Field Investigation Manager: Tim Thompson

WEATHER ***Bright Sun*** Partly Cloudy Overcast Rain Snow
TEMPERATURE °F <32° 32-45° 45-60° 60-70° ***70-85°*** >85°
WIND Still **Mod.** High
HUMIDITY Dry **Mod.** Humid
RIVER STAGE:

Time	9:00	10:00	11:00	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00
USGS Morrison Bridge (ft)	2.33	2.24	2.53	3.03	3.26	3.39	3.34	3.2	3.06	2.84	2.82	2.74	2.62	2.53	2.38	2.26	2.16	2.07
NAVD 88 (ft)	7.38	7.29	7.58	8.08	8.31	8.44	8.39	8.25	8.11	7.89	7.87	7.79	7.67	7.58	7.43	7.31	7.21	7.12

TASK: ☐ Industrial Area Soils ☐ Industrial Area Groundwater ☑ Porewater ☐Sediment ☐ MIS

SUBCONTRACTORS/VISITORS ON SITE: Erin Carroll Hughes, GSI; Rich May, DOF; Justin Siewert, BMC; Matt Schwake, BMC; Warren Miller, BMC; Shane Veentjer, BMC; Shawn Oliveira, CDM; Tim Thompson, SEE.

EQUIPMENT ON SITE: Ballard Marine Construction vessels

WORK PERFORMED (INCLUDE ANY SAMPLES COLLECTED):

- **On Site at 0715 hours**. Mobilization of vessel and equipment.
- **On Board at 0800 hours**. Conducted the pre-dive briefing per the Passive Sampling SOP and a H&S briefing.
- **Training Diver-Placement of Passive Samplers (0825-0840)**. Reviewed the day's sampling locations and methods for the BMC crew plus GSI and CDM. Focused training for the divers who were not on the reconnaissance survey (Matt Schwake and Warren Miller).
- **Navigation.** Navigation was conducted according to the procedures listed in the SOP. At each station the way point was confirmed with both dGPS units, and an anchor line was placed as close to the coordinates as could physically be accomplished. Diver descended along that fixed anchor line and fixed the PE samplers at that point. Final coordinates were recorded in the field notebook. Two exceptions: PW001 and PW006 are discussed below.
- **Installed PE Samplers.** Installation logs for each station are attached to this report.

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS)

- Two Trimble GeoXH – GeoExplorer 2008 Series - dGPS units onboard. All units reported the same location within accuracy of 1 ft. Check of the dGPS at the inside corner upstream (approximately SE) of the Glacier Dock, or the inside downstream corner (approximately NE) of the Cargill Dock did not occur. Therefore, the additional navigation check was not thought necessary for target placement.
- Depth taken at each station, Water depths corrected to USGS Willamette River Gage depths, and then converted to NAVD88 (see table, above).

HEALTH AND SAFETY LEVELS AND ACTIVITIES: **Tailgate Meeting Held ☑**

- H&S Briefing conducted prior to leaving dock. H&S review included slip-trip-fall, designated hazard zones, man-overboard and emergency procedures

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Target coordinates had to be estimated for two stations, PW001 and PW006, due to obstructions that prevented the vessel from getting over the location. The actual locations are discussed further by station, below.
- PW007 it was not possible to drive the passive sampler; the site was rock and cobble, not sediment. After consultation with EPA, placed the sampler by creating an approximately 8" hole, and then backfilling around sampler.
- *M/V Liberty* scheduled to arrive at the Cargill Dock approximately mid-day. Set PE samplers at station PW006 nearest Cargill dock prior to vessel arrival. *Liberty* docked at approximately 12:30. Approximately 1 hour of down time waiting for vessel to complete docking as propeller wash from tugs and *Liberty* created unsafe dive conditions (current).

SPECIAL NOTES:

- Significant changes to the Passive Sampling SAP and SOP occurred at PW001, PW006, and PW007. These are discussed individually in the Installation Logs.
- Installation logs are organized in chronologically (first to last)

TOMORROW'S EXPECTATIONS:

- Demobilize

ATTACHMENTS:

Passive Sampler Deployment Logs

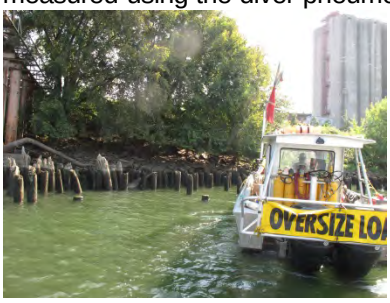
PREPARED BY: Tim Thompson

SIGNATURE: Filed electronically.

PW006 Passive Sampler Deployment Log

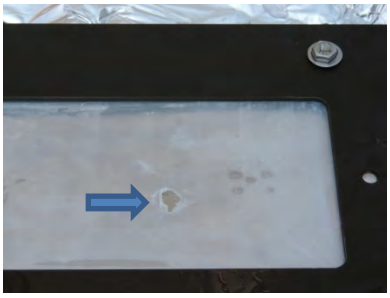
Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.535954	E: -122.678338	N: 45.53595525	E: -122.67608352
Deployment Time: 09:37 – 10:07		Actual location approximately 15 ft inshore of coordinates	
Pinger kHz: No pinger required.		Measured Depth = 24 ft	River Height = 7.3 ft
Diver: Matt Schwake		Corrected Elevation (NAVD88 ft) = -16.7 ft	

Location: Target coordinates were back in amongst pilings (see photo). River stage was too low for the vessel to be directly over the target coordinates. dGPS indicated the target location was 15 ft inshore of the coordinates recorded at the boat. Photograph taken of the sampler location. Station depth was measured using the diver pneumofathometer.



Bottom Description: Visibility 7 – 10 ft. Sandy with some gravel. Approximate 45º slope on bottom. Tree branches and 0.5 – 1.0 ft rip rap

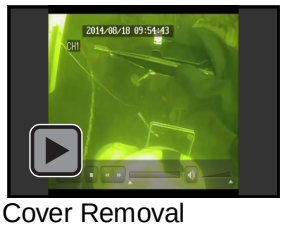
Installation Notes: Prior to installation a small hole (< 1cm) was noted in the PE in the top segment. As this was in the water-exposure section, was determined to be sufficiently small as to not warrant changing the PE out.



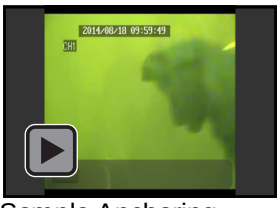
Installation: Installation proceeded according to the SAP. "A" sampler placed first, driven to the stop on the hammer. "B" sampler placed inshore two hand-widths apart. After driving, the plates were removed and the two samplers were anchored by tying to the adjacent piling. Since the sampler was anchored to the piling, determined that a pinger was not necessary.

Water was sufficiently clear during this installation so as to record the process with the diver camera. Three video clips are attached: (1) sampler installation, (2) cover removal, and (3) anchoring of the samplers.

Sampler Install



Cover Removal



Sample Anchoring

PW003 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location**	
N: 45.536604	E: -122.677047	N: 45.533604	E: -122.677047
Deployment Time: 10:31-10:52 hours		Notes: ---	
Pinger = 33 kHz		Measured Depth = 12 ft	River Height = 7.5
Diver: Matt Schwake		Corrected Elevation (NAVD88 ft) = - 4.5	

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates and depth taken. Station is up against the shore in front of the cable crossing, and was previously visited during the reconnaissance survey. The attached figures show the station location.

Bottom Description: Sandy bottom with rip rap. Slope approximately 20%.

Installation: Samplers successfully hammered into place, and installed approximately 8 inches (two hand widths) apart. Both samplers tied into 12" screw anchors located upstream and downstream. Pinger attached to the downstream anchor.

Water was sufficiently clear during this installation so as to record the process with the diver camera. Two video clips are attached: (1) sampler installation, (2) and anchoring of the samplers.

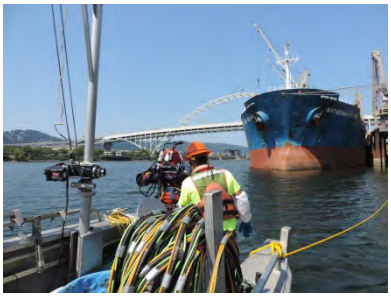
Sampler Install

Sample Anchoring

PW004 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.536379	E: -122.677303	N: 45.536379	E: -122.677303
Deployment Time: 11:24 – 11:47		Notes: ---	
Pinger = 25 kHz		Measured Depth = 35.0 ft	River Height = 7.8
Diver: Matt Schwake		Corrected Elevation (NAVD88 ft) = -27.2	

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates and depth taken. Station upstream of Glacier dock, facing the vessel



Bottom Description: Sandy sediment, with chains, wire rope, and large cable on bottom. Visibility less than an estimated 6 ft based on diver cam view.

Cable next to installation

Installation: Samplers successfully hammered into place, and installed approximately 8 inches (two hand widths) apart. Both samplers tied into 12” screw anchors located upstream and downstream. Pinger attached to the inshore PE sampler.

Diver Decontamination: After this station the diver (Matt Schwake) went through full decontamination prior to exiting dry suit and hot zone.

PW005 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.53611	E: -122.677675	N: 45.53611	E: -122.677675
Deployment Time: 13:08 - 13:41		Notes: ---	
Pinger = 27 kHz		Measured Depth = 44.0 ft	River Height = 8.4
Diver: Shane Veentjer		Corrected Elevation (NAVD88 ft) = -35.6	

Dive Notes: *M/V Liberty* came into the Cargill Dock at approximately 12:30. Dive team eleced to wait until the vessel had come to the dock, and the tugs had departed, to begin. Dive was then initiated at 13:08 hours. Docking procedures re-suspended a good deal of bottom sediment; diver cam videos were very murky.

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates. Depth taken with diver pressure gage.

Bottom Description: 0.75 inch gravel mixed with soft sediments. Some small organic debris. Visibility less than an estimated 4 ft based on diver cam view.

Installation: Samplers successfully hammered into place, and installed approximately 8 inches (two hand widths) apart. Both samplers tied into 12” screw anchors located upstream and downstream. Pinger attached to the inshore PE sampler.

PW001 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.536728	E: -122.678338	N: 45.536694	E: -122.678369
Deployment Time: 1400 to 1434 hours			
Pinger kHz = 29		Measured Depth = -48.0 ft	River Height = 8.25
Diver: Shane Veentjer		Corrected Elevation (NAVD88 ft) = -39.75	

Location: Target coordinates for PW001 were located underneath commercial vessel *Matakana Island* at the Glacier dock. Up immediately against the vessel hull it was not possible to get a good satellite fix. Moved out perpendicular to the vessel/shore until an accurate satellite fix could be taken, and the direction and distance to the target station calculated. Sample location was 30 ft from the fix location, which was an estimated 15 ft underneath the vessel. Diver would not go under the vessel; we estimated then when diving next to the hull he was 15 ft outboard of the target. Final location is reported then as an estimate.

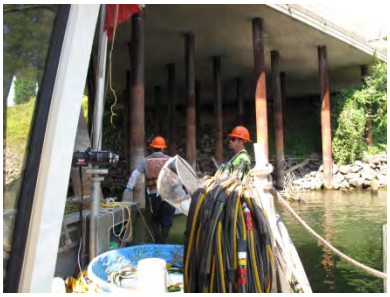
Bottom Description: Sandy soft sediment with wood debris on, and under surface. Visibility less than an estimated 4 ft based on diver cam view.

Installation: Samplers required hammering for installation, and were installed approximately 8 inches (two hand widths) apart. Two 24” screw anchors installed approximately 2/3 into sediment. Both samplers tied into anchors and pinger attached to the sampler,

PW002 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.536855	E: - 122.677654	N: 45.53693865	E: -122.6774682
Deployment Time: 1450 to 1509 hours		Notes: Located under Glacier Pier.	
Pinger - not required		Measured Depth = -15.0 ft	River Height = 8.25
Diver: Shane Veentjer		Corrected Elevation (NAVD88 ft) = -6.75	

Location: Target coordinates for PW002 were located underneath the upstream/inshore end of the Glacier Dock. Station was at the third steel piling from shore.



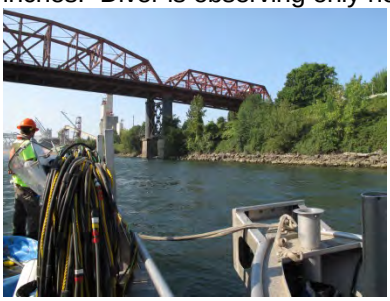
Bottom Description: Soft silty sediment with wood debris, some rip rap, no gravel. Visibility less than an estimated 4 ft based on diver cam view.

Installation: Samplers required hammering for installation, and were installed approximately 8 inches (two hand widths) apart. Anchored the samplers directly to the adjacent pilings. Given the fixed location a pinger was not deemed necessary.

PW007 Passive Sampler Deployment Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.53159	E: -122.672328	N: 45.5315892	E: -122.6723436
Deployment Time: 16:35 – 18:12		Notes: Approximately 15 riverward of target station	
Pinger = 31 kHz		Measured Depth = 48.0 ft	River Height = 7.81 at 18:00
Diver: Shane Veentjer Warren Miller		Corrected Elevation (NAVD88 ft) = -40.19	

Location: Target location coordinates are not matching with the description in the core logs for station C043. The core log shows a depth of approximately 6 ft; diver is at -40.2 ft. A copy of the 2009 core log for C043 (from the Focused Characterization Report) showed a surface of sandy-silt/silty-sand to 72 inches. Diver is observing only heavy rock and cobble; no sediment.



Bottom Description: Large rock and gravel, persistent to at least 1 ft below surface. Visibility estimated 4 - 5 ft based on diver cam view.

Attempted Installation: Attempted unsuccessfully to hammer sampler in place. After several minutes of pounding the sampler had only advance approximately 4 inches. At that point the diver (Shane Veentjer) had hit maximum bottom time, so it was necessary to change divers.

Warren Miller was the next diver in-water. Instructed the diver to proceed first in shore up to 30 ft, and then in an arc around the target location to determine whether there was a sediment location where the samplers could be driven. Diver went inshore, offshore, and up and down river without identifying any sediment; all rock and cobble. After 25 minutes pulled diver and telephoned EPA to discuss alternatives.

The net result of the discussion with EPA is documented in the attached *Field Change Request Form* dated August 21, 2014. The diver was re-deployed at the target coordinates and instructed to make one more attempt to drive the sampler at the target location.

Final Installation: Driving with the hammer assembly was not successful. The diver was instructed to remove rocks to create a void in the river bed for sampler installation. The diver was able to create whole approximately 8 inches deep (20 cm of the target 30 cm). The rocks/gravel was then pushed back into the hole around the sampler. As the diver was up against his bottom time limits, elected to put only one sampler in with two anchor points were to secure the sampler.

When diver returned to the surface noted that the sample covers were missing. When asked, diver indicated he had failed to clip them in after pulling and had lost the samplers.

Appendix D

Passive Sampler Retrieval and Sediment Sample Collection Report

ACTIVITY REPORT

Report # **3: Sampler Retrieval** **DATE** **October 20, 2014** S ***M*** T W TH F S

Field Investigation Manager: **Tim Thompson, SEE**
Sampling and Analysis Coordinator: **Erin Carroll Hughes, GSI**

WEATHER Bright Sun Partly Cloudy ***Overcast*** ***Rain*** Snow
TEMPERATURE °F <32° 32-45° 45-60° ***60-70°*** 70-85° >85°
WIND Still **Mod.** High
HUMIDITY Dry **Mod.** Humid
RIVER STAGE:

Time	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	13:45	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00
USGS Morrison Bridge (ft)	2.78	2.62	2.45	2.27	2.08	1.91	1.76	1.63	1.55	1.59	1.87	2.44	2.79	3.21	3.98	4.57	4.93	5.02	5.03	4.98	4.8	4.49
NAVD 88 (ft)	7.83	7.67	7.5	7.32	7.13	6.96	6.81	6.68	6.6	6.64	6.92	7.49	7.84	8.26	9.03	9.62	9.98	10.07	10.08	10.03	9.85	9.54

TASK: ☐ Industrial Area Soils ☐ Industrial Area Groundwater ☑ Porewater ☑ Sediment ☐ MIS

SUBCONTRACTORS/VISITORS ON SITE: Justin Siewert, Ballard Marine Construction (BMC); Shane Veentjer, BMC; John Cross, BMC; Josh Liebing, BMC; Paul Opem, CDM

EQUIPMENT ON SITE: BMC vessels

WORK PERFORMED (INCLUDE ANY SAMPLES COLLECTED):

- **On Site at 0705 hours**. Mobilization of vessel and equipment.
- **On Board at 0800 hours**. Conducted pre-dive briefing per the Standard Operating Procedures (SOP) and a health and safety (H&S) briefing.
- **Training Diver-Placement of Passive Samplers (0825-0840)**. Reviewed the day's sampling locations and methods for the BMC crew plus GSI and CDM. Emphasis on process of passive sampler recollection, and on operation of the sediment sampler.
- **Navigation.** Navigation was conducted according to the procedures listed in the Passive Sampling SOP. At each station, the way point was confirmed with both dGPS units, and an anchor line was placed as close to the coordinates as could physically be accomplished. Divers used a hand-held Benthos DPL-275 pinger locator for the offshore stations. For the two nearshore stations (PW002 and PW006) where the passive sampler was tethered to nearby pilings, the diver proceeded to the known location for retrieval.
- **Recovered Polyethylene (PE) Samplers.** Retrieval logs for each station are attached to this report.
- **Co-located Sediment Samples**. Sediment sample collection logs for each station are attached to this report.

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS)

- Navigation point was re-recorded using a Trimble GeoXH – GeoExplorer 2008 Series - dGPS units onboard.
- Depth was taken using the pneumofathometer by BMC. Water depths corrected to USGS Willamette River Gage depths, and then converted to NAVD88 (see table, above).

HEALTH AND SAFETY LEVELS AND ACTIVITIES: **Tailgate Meeting Held** ☑

- H&S briefing conducted prior to leaving dock. H&S review included slip-trip-fall, designated hazard zones, man-overboard and emergency procedures. Also discussed, the diver over-head hazard associated with lowering the heavy sediment sampler from the boat to the bottom.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

- Navigation coordinates recorded for August 18, 2014 did not match with those recorded during the October 20 retrieval for PW001, PW004, PW005, and PW006. With the exception of PW001, the recorded stations were within 10 feet (ft). PW001 was recorded as being 70 ft. downstream from the position recorded on August 18. On review, the August 18 position is more likely to be accurate. See notes for PW001.

- At PW002 the diver removed the passive samplers before positioning the sediment sampler. This was the first station collected. This was noted and corrected for all subsequent stations.
- The first sediment core at PW001 did not achieve the required 30 centimeters (cm) of sample material. Core tube was emptied, rinsed, and returned to the diver to take a second core. Second core yielded the required 30 cm.
- A sediment sample was not possible at PW007. This was expected. The rocky conditions at that site were noted to EPA in the August 18, 2014 Field Change Request.
- At PW007 when the diver brought the passive sampler to the surface, the stainless steel cover plates were still in place. During deployment the BMC diver had indicated that he lost the cover plates when asked. Apparently these were never removed. Informed EPA and recommended that we proceed with analyzing the sample.
- During post-processing we became aware that (1) not all depths at all stations were recorded by BMC, and (2) there were depth differences between that at deployment and that at retrieval. Depth data are shown below. The most important depth was that recorded at the time of deployment. These differences do not effect data quality.

Station	Depth at Deployment (NAVD88)	Depth at Retrieval (NAVD88)
PW001	-48.0	-35.3
PW002	-6.75	-3.9
PW003	-4.5	Not recorded
PW004	-27.2	-26.1
PW005	-35.6	-35.4
PW006	-16.7	Not recorded
PW006	-40.2	Not recorded

SPECIAL NOTES:

- Retrieval logs are organized in chronologically (first to last)

TOMORROW'S EXPECTATIONS:

- Process PE and sediment samples at ALS

ATTACHMENTS:

Passive Sampler Retrieval and Sample Collection Logs

PREPARED BY: Tim Thompson

PW002 Passive Sampler Retrieval and Sample Collection Log

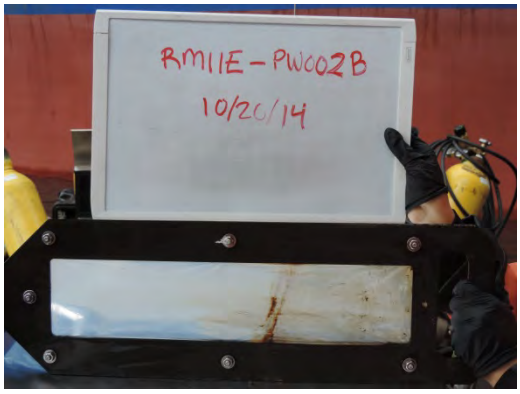
August 18, 2014 Coordinates		**October 20, 2014 (Estimated) Coordinates**	
N: 45.53693865	E: -122.6774682	N: 45.53693865	E: -122.6774682
Dive Time: 10:00 – 10:18		Notes: Located under Glacier Pier.	
Pinger - not required		Measured Depth = -10.0 ft	River Height = 7.1
Diver: Shane Veentjer		Corrected Elevation (NAVD88 ft) = - 3.9 ft	

Location: Target coordinates for PW002 were located underneath the upstream/inshore end of the Glacier Dock. Station was at the third steel piling from shore. Diver readily located samplers.

Passive Sampler Retrieval: Diver first reported the depth to the top of sampler from the mud line: PW002-A = 9 inches; PW002-B = 12 inches. Anchor lines were cut and the diver pulled both samplers and returned those to the surface. Both the “A” and “B samplers were intact. Both samplers were wrapped in foil, labelled, and placed in an ice chest. Measured depth at time of retrieval is approximately 2.75 ft shallower than reported at deployment. This may be due to taking a physical (lead line) measure at deployment, and using the pressure-differential measure at retrieval.

The SOP requires the placement of sediment sampler between the two passive samplers prior to removing those. That the passive samplers were removed at this station first was noted to the dive team, and was corrected for all subsequent sites.

Sediment Sampling: The diver was able to locate the position between the two passive samplers to take a sediment sample. The core tube was driven to the full length of 2.7 ft (80 cm). Confirmed onboard that the sample acquisition was 1.5 ft. Core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.



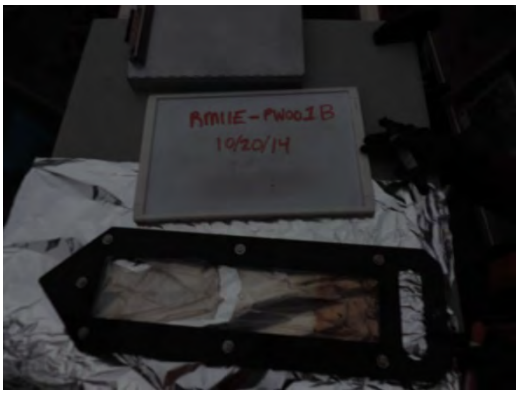
PW001 Passive Sampler Retrieval and Sample Collection Log

August 18, 2014 Coordinates		**October 20, 2014 (Estimated) Coordinates**	
N: 45.536694	E: -122.678369	N: 45.536837	E: -122.678576
Dive Time: Total of 1 hour 8' bottom time. Sample Time 11:02		Notes: Located under ship at dock	
Pinger kHz = 29		Measured Depth = -42.0 ft	River Height = 6.7
Diver: Shane Veentjer		Corrected Elevation (NAVD88 ft) = -35.3	

Location: Target coordinates for PW001 were located underneath a commercial vessel in dock at the Glacier pier. Diver used the pinger locator to find the station, but still had difficulty locating the samplers. Once found, the passive samplers with anchors were intact. BMC took a station coordinate fix to the dGPS, which when later viewed were approximately 70 ft south of the August 18 reported installation coordinates. Upon further review, the October 20 coordinates were not taken directly over the anchored location (i.e., they were taken at the support boat) and were based on diver bubbles. Measured depth at time of retrieval is approximately 3.5 ft shallower than reported at deployment.

Passive Sampler Retrieval: Diver first reported the depth to the top of sampler from the mud line: PW001-A = 9 inches; PW001-B = 11 inches. Prior to pulling the passive samplers, the sediment sampler was deployed to the diver and placed between the two samplers. The anchor lines were then cut and the diver pulled both samplers and returned those to the surface. Both the "A" and "B samplers had rips in the PE within the sediment-exposed segments (see photos, below). These will likely not impact the PCB analysis. Both samplers were wrapped in foil, labelled, and placed in an ice chest.

Sediment Sampling: Core tube was driven 2.7 ft, but when brought to the surface had only 0.7 ft of recovery. The sample was rejected, the core tube emptied, cleaned and returned to the diver for a second drive. Second drive was located approximately 4 inches downstream from the first location, and was driven 2.2 ft with a recovery of 1 ft (30 cm). On-board the core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.



PW004 Passive Sampler Retrieval and Sample Collection Log

August 18, 2014 Coordinates		**October 20, 2014 Coordinates**	
N: 45.536379	E: -122.677303	45.536399	-122.677262
Dive Time: 12:50 – 13:05		Notes: ---	
Pinger = 25 kHz		Measured Depth = 33.0 ft	River Height = 6.92
Diver: : Shane Veentjer		Corrected Elevation (NAVD88 ft) = -26.08	

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates and depth taken. Diver was able to quickly locate the passive samplers using the pinger locator.

Passive Sampler Retrieval: Diver first reported the depth to the top of sampler from the mud line: PW004-A = 12 inches; PW004-B = 12 inches. Prior to pulling the passive samplers the sediment sampler was deployed to the diver and placed between the two samplers. The anchor lines were then cut and the diver pulled both samplers and returned those to the surface. PW004-A was intact, while PW004-B had a small hole in the upper water-exposed section (see photos, below). The small hole in the PE will not likely impact PCB analysis. Both samplers were wrapped in foil, labelled, and placed in an ice chest.

Sediment Sampling: Core tube was driven 2.7 ft, and had 1.7 ft acquisition. On-board the core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.

Diver Decontamination: After this station the diver (Shane Veentjer) went through full decontamination prior to exiting dry suit and hot zone. Next diver (Josh Liebing) suited up and prepared for the next dive.

PW005 Passive Sampler Retrieval and Sample Collection Log

August 18, 2014 Coordinates		**October 20, 2014 Coordinates**	
N: 45.53611	E: -122.677675	N: 45.536128	E: -122.677797
Deployment Time: 14:35 – 15:30 (est)		Notes: ---	
Pinger = 27 kHz		Measured Depth = 45.0 ft	River Height = 9.62
Diver: Josh Liebing		Corrected Elevation (NAVD88 ft) = -35.4	

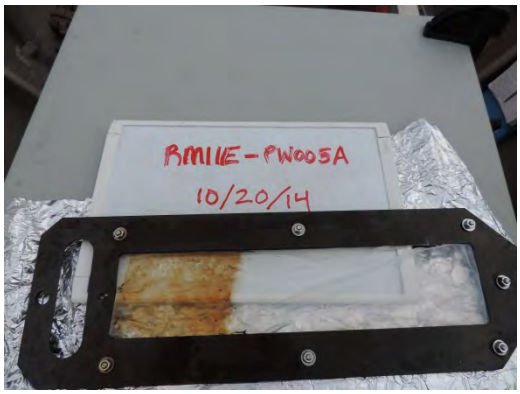
Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates. Diver had some difficulty using pinger locater; took approximately 35 minutes to locate passive samplers.

Passive Sampler Retrieval: Diver first reported the depth to the top of sampler from the mud line: PW005-A = 8-9 inches; PW005-B = 8-9 inches. Prior to pulling the passive samplers, the sediment sampler was deployed to the diver and placed between the two samplers. The anchor lines were then cut and the diver pulled both samplers and returned those to the surface.

At surface it was not clear which sampler was the “A” and which was “B”, as the diver had not kept the passive samplers separate. The PE in both samplers was intact. The passive samplers were photographed, wrapped in foil, labelled, and placed in an ice chest. In the lab the next day it was determined that the field photos were reversed. Using the individual numbers etched into frame, and checking against the loading notes on August 17, determined the correct designation.

Sediment Sampling: Core tube was driven 2.7 ft, and had 1.6 ft acquisition. On-board the core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.

PW005-A (lab verified)



PW005-B (lab verified)

PW007 Passive Sampler Retrieval and Sample Collection Log

Proposed Coordinates		**Actual Location (Estimated)**	
N: 45.53159	E: -122.672328	N: 45.531624	E: -122.672434
Dive Time: not recorded. Sample at 16:40		Notes: Approximately 15 riverward of target station	
Pinger = 31 kHz		Measured Depth = no data	River Height = no data
Diver: Josh Liebing		Corrected Elevation (NAVD88 ft) = no data	

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates. The diver had difficulty using the pinger locater; took over 40 minutes to locate passive sampler.

Passive Sampler Retrieval: For the sole passive sampler in place at PW007, the diver reported the depth to the top of sampler from the mud line at 10-11". When the sampler was brought onboard, it was apparent that during deployment that the diver had failed to remove the stainless steel plate. The missing plate was noted on August 18, but the diver indicated he had lost it, not left it in place. The plate was removed, and the passive sampler was photographed, wrapped in foil, labelled, and placed in the ice chest.

Sediment Sampling: Sediment sampling was not possible at this site.

PW006 Passive Sampler Retrieval and Sample Collection Log

August 18, 2014 Coordinates		**October 20, 2014 Coordinates**	
N: 45.53595525	E: -122.6708352	N: 45.535923	E: -122.676084
Diver Time: not recorded. Sample at 17:30		Actual location approximately 15 ft inshore of coordinates	
Pinger kHz: No pinger required.		Measured Depth = not recorded	River Height = 9.03 ft
Diver: Josh Liebing		Corrected Elevation (NAVD88 ft) = not recorded	

Location: Target coordinates were back in amongst pilings (see photo). River stage was too low for the vessel to be directly over the target coordinates. dGPS indicated the target location was 15 ft inshore of the coordinates recorded at the boat.

Passive Sampler Retrieval: Diver reported the depth to the top of sampler from the mud line: PW006-A = 8-9 inches; PW006-B = 8-9 inches. Prior to pulling the passive samplers, the sediment sampler was deployed to the diver and placed between the two samplers. The anchor lines were then cut and the diver pulled both samplers and returned those to the surface. There was a small hole (1 cm) in the surface water-exposed segment of the “B” sampler. The passive samplers were photographed, wrapped in foil, labelled, and placed in an ice chest.

Sediment Sampling: Core tube was driven 2.7 ft, and had 2.4 ft acquisition. On-board the core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.

PW003 Passive Sampler Retrieval and Sample Collection Log

August 18, 2014 Coordinates		**October 20, 2014 Coordinates**	
N: 45.536604	E: -122.677047	N: 45.533604	E: -122.677047
Dive Time: not recorded. Sampled at 18:14		Notes: ---	
Pinger = 33 kHz		Measured Depth = not recorded	River Height = 9.9 ft
Diver: Josh Liebing		Corrected Elevation (NAVD88 ft) =	

Location: Support vessel was able to get over the target location; anchor line dropped at the target coordinates and depth taken. Station is up against the shore in front of the cable crossing, and was previously visited during the reconnaissance survey. Diver was quickly able to find the passive samplers.

Passive Sampler Retrieval: Diver reported the depth to the top of sampler from the mud line: PW003-A = 12 inches; PW003-B = 10 inches. Prior to pulling the passive samplers, the sediment sampler was deployed to the diver and placed between the two samplers. The anchor lines were then cut and the diver pulled both samplers and returned those to the surface. The PE in both samplers was intact. The passive samplers were photographed, wrapped in foil, labelled, and placed in an ice chest.

Sediment Sampling: Core tube was driven 2.7 ft, and had 1.4 ft acquisition. On-board the core tube was capped, duct taped at both ends, labelled with sample date and time, and then stored vertically on ice.

Diver Decontamination: After this station the diver (Josh Liebing) went through full decontamination prior to exiting dry suit and hot zone.

Appendix E

Passive Sampler and Sediment Sample Post-Processing Report

ACTIVITY REPORT

Report # **4: Post-processing** **DATE** **October 21, 2014** S M ***T*** W TH F S

Field Investigation Manager: Tim Thompson
Sample Analysis Coordinator: Erin Carroll Hughes

Location: ALS Labs, Kelso, WA

TASK: ☐ Industrial Area Soils ☐ Industrial Area Groundwater ☑ Porewater ☑Sediment ☐ MIS

SUBCONTRACTORS/VISITORS ON SITE: Erin Carroll Hughes, GSI; Tim Thompson, SEE.

EQUIPMENT ON SITE:

WORK PERFORMED (INCLUDE ANY SAMPLES COLLECTED):

- **On Site at 0830 hours**. .
- **Health and Safety**. ALS briefing on H&S procedures at their facility
- **Processed all PE Samplers**.
- **Processed Sediment Samplers**
- **Logged all samples onto chain-of-custody forms and released samples to ALS**

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS)

- Field replicates for PE (sediment and water) and bulk sediments collected

HEALTH AND SAFETY LEVELS AND ACTIVITIES: **Tailgate Meeting Held ☑**

- H&S Briefing at ALS included reviewing eye-protection requirements and fire procedures.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN: None

SPECIAL NOTES: None

TOMORROW'S EXPECTATIONS: demobilize

ATTACHMENTS:

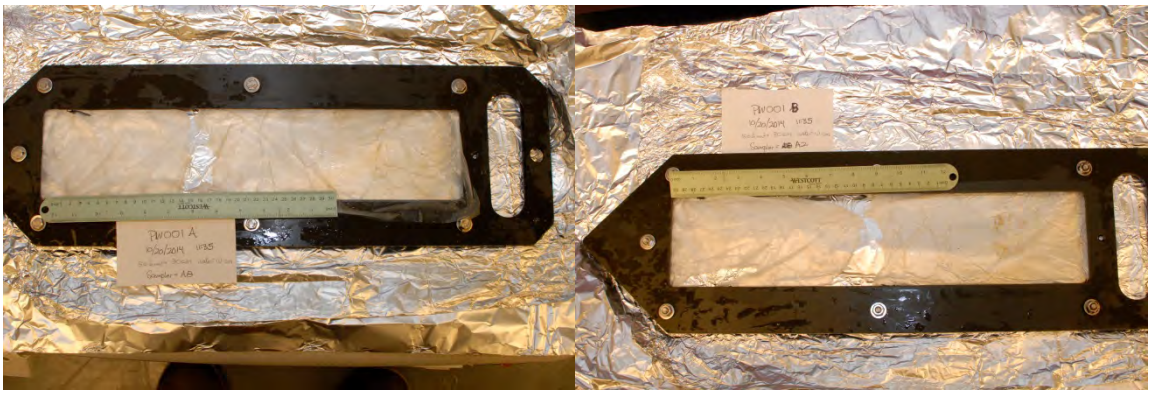
PE and Sediment Processing Logs
PE Sample Inventory
Sediment Sample Inventory
Chain-of-Custody(s)

PREPARED BY: Tim Thompson

PW001 PE and Sediment Processing Log

Passive Sampler Log and Samples. PE largely intact, but with tears in both samplers in the sediment-exposed sections. Measured sediment and water exposure intervals, and sample IDs, reported below.

Porewater Station	Sampler	Sampler Frames	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID
PW001	A	A0, A1	30	15	Sediment - PWP001 A
					Water – PWW001 A
	B	A2,A4	30	15	Sediment - PWP001 B
					Water – PWW001 B



Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW001	A	30	15	Sediment - PWP001 A	2	✓		✓
				Water – PWW001 A	2	✓		✓
	B	30	15	Sediment - PWP001 B	2		✓	
				Water – PWW001 B	2		✓	

Sediment log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW001-Sed	2.2	1.3	59%	0	25.4	(0 cm - 15.4 cm) Medium dense, olive grey, moist, sand with minor silt, poorly graded (SP) fine sand; moderately rounded, some small gravel present. (15.4 cm - 25.4 cm) Medium dense, olive grey, moist, sandy gravel (0,20,80) (GW), sub-rounded, moderately sorted, yellow, green, grey, and red lithics (1/4-1.5").	no debris	slight organic	none observed	olive gray

Note: Grain size values presented in parenthesis represent the estimated percent fines, sand, and gravel. For example, (0, 20, 80) would be read as 0% fines, 20% sands, and 80% gravel.

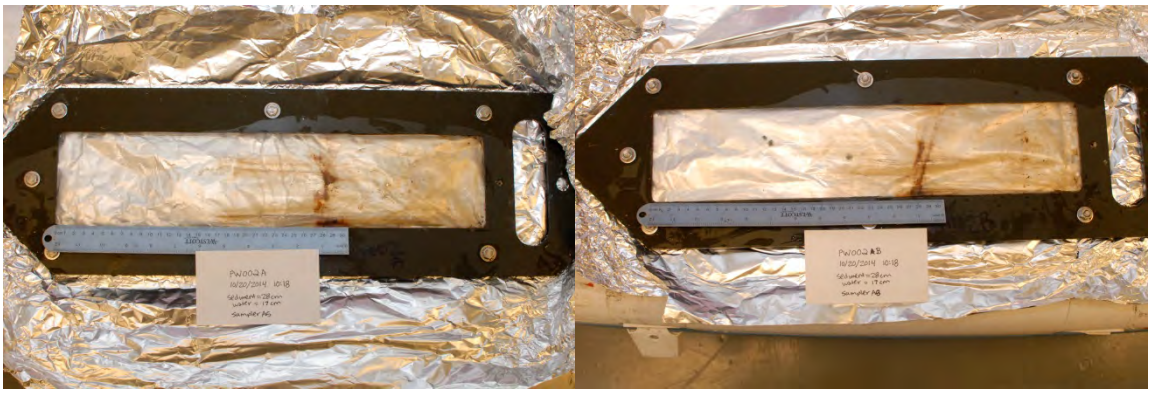
Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW001	RM11E PW001 - SED	5	✓	✓	✓	✓	✓	✓	✓

PW002 PE and Sediment Processing Log

Passive Sampler Log and Samples. PE intact. Measured sediment and water exposure intervals, and sample IDs, reported below.

Porewater Station	Sampler	Sampler Frames	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID
PW002	A	A5, A6	28	17	Sediment - PWP002 A
					Water – PWW002 A
	B	A7, A8	27	19	Sediment - PWP002 B
					Water – PWW002 B



Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW002	A	28	17	Sediment - PWP002 A	2	✓	✓	
				Water – PWW002 A	2	✓	✓	
	B	27	19	Sediment - PWP002 B	1		✓	
				Water – PWW002 B	1		✓	

Sediment Log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW002-Sed	2.7	1.5	56%	0	30.5	(0 cm-15.25 cm) Medium stiff, olive gray, moist, sandy silt (0,40,60) (ML), woody debris, non-plastic. (15.25 cm - 30.5 cm) Medium stiff, olive grey, moist, silty clay (90,10,0) (CL), minor wood, trace sand.	metal rivet	hydrocarbon odor methane bubbles	none observed	olive gray

Note: Grain size values presented in parenthesis represent the estimated percent fines, sand, and gravel. For example, (0, 40, 60) would be read as 0% fines, 40% sands, and 60% gravel.

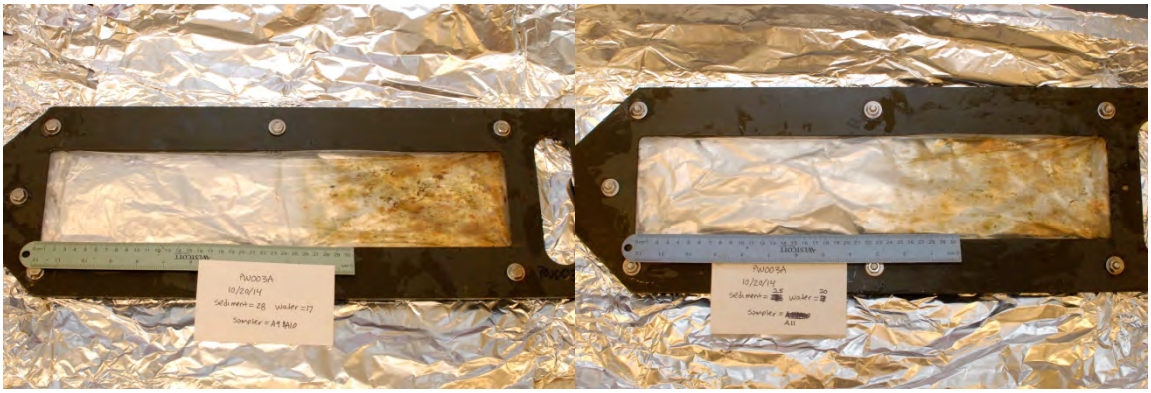
Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW002	RM11E PW002 - SED	6	✓	✓	✓	✓	✓	✓	

PW003 PE and Sediment Processing Log

PSD Recovery and Sample Log PE intact. Measured sediment and water exposure intervals, and sample IDs, reported below.

Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW003	A	28	17	Sediment - PWP003 A	2	✓	✓	
				Water – PWW003 A	2	✓	✓	
	B	25	20	Sediment - PWP003 B	1		✓	
				Water – PWW003 B	1		✓	



Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW003	A	28	17	Sediment - PWP003 A	2	✓	✓	
				Water – PWW003 A	2	✓	✓	
	B	25	20	Sediment - PWP003 B	1		✓	
				Water – PWW003 B	1		✓	

Sediment Log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW003-Sed	2.7	1.3	48%	0	24.4	(0 cm - 15.25 cm) medium stiff, olive gray, moist, silty clay (CL), low plasticity. (15.25 cm - 24.4 cm) loose, dark gray, moist, gravel (GP) 0.5-1", angular, minor silt (5,0,95).	asphalt chunks	hydrocarbon odor	none observed	olive gray

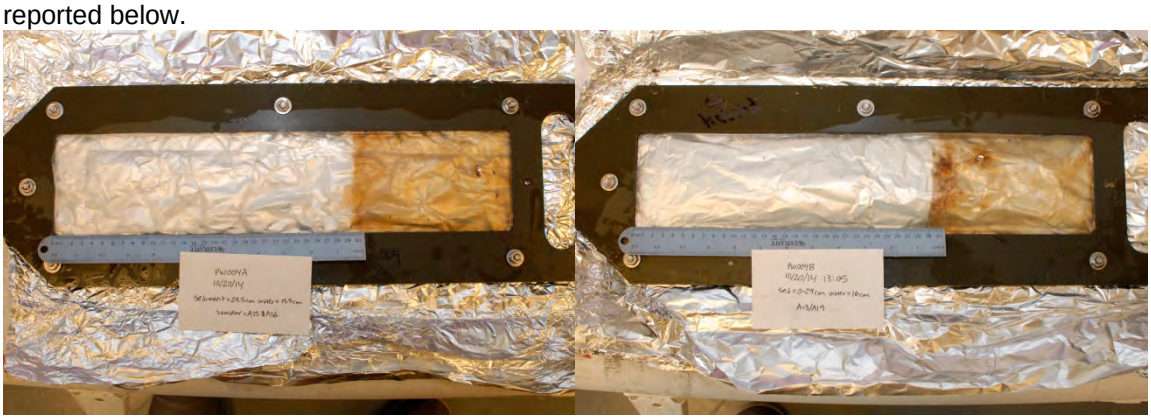
Note: Grain size values presented in parenthesis represent the estimated percent fines, sand, and gravel. For example, (5, 0, 95) would be read as 5% fines,20% sands, and 95% gravel.

Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW003	RM11E PW003 - SED	4	✓	✓	✓	✓	✓		

PW004 PE and Sediment Processing Log

Passive Sampler Log and Samples PE largely intact. Small holes in the water-exposed portions for both the "A" and "B" samplers. Measured sediment and water exposure intervals, and sample IDs, reported below.



Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW004	A	29.5	15.5	Sediment - PWP004 A	2	✓		✓
				Water – PWW004 A	2	✓		✓
	B	29	16	Sediment - PWP004 B	1		✓	
				Water – PWW004 B	1		✓	

Sediment Log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW004-Sed	2.7	1.5	56%	0	30.5	(0 cm - 30.5 cm) Loose, olive gray, moist, gravelly sand with silt (10,80,10) (SP), sand is fine grained, sub round, gravel is 1/4-2" subrounded, dark grey, yellow lithics, lots of woody debris, more gravel at top.	Wood, duct tape	hydrocarbon odor	none observed	olive gray

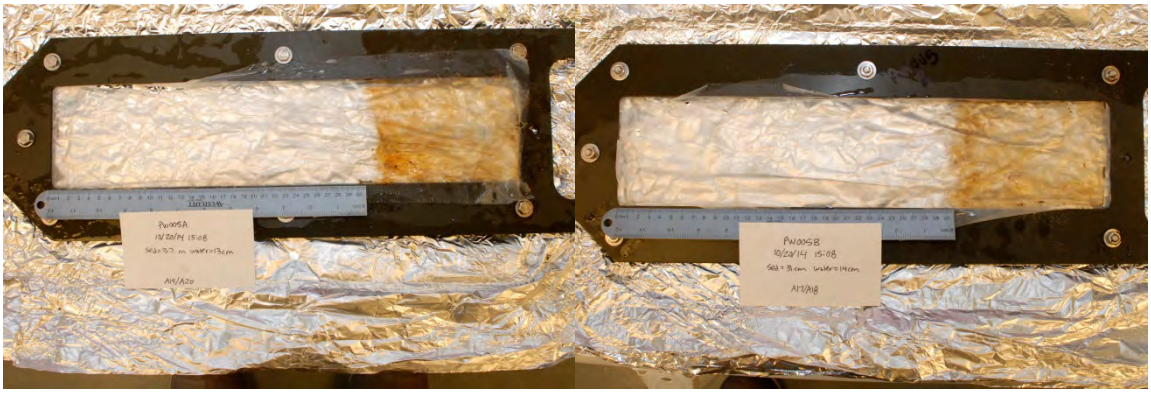
Note: Grain size values presented in parenthesis represent the estimated percent fines, sand, and gravel. For example, (10, 80,10) would be read as 10% fines, 80% sands, and 10% gravel.

Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW004	RM11E PW004 - SED	6	✓	✓	✓	✓	✓		✓

PW005 PE and Sediment Processing Log

Passive Sampler Log and Samples. PE intact. Measured sediment and water exposure intervals, and sample IDs, reported below.



Porewater Station	Sampler	Sediment	Water	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
		Exposure (cm)	Exposure (cm)					
PW005	A	32	13	Sediment - PWP005 A	2	✓	✓	
				Water – PWW005 A	2	✓	✓	
	B	31	14	Sediment - PWP005 B	1		✓	
				Water – PWW005 B	1		✓	

Sediment Log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW005-Sed	2.7	1.1	41%	0	30.5	(0 cm - 9 cm), Medium stiff,olive gray, wet, silty clay with some gravel (90,0,10) (CL), gravel is <1" sub rounded to angular. (9.1 cm - 30.4 cm), Medium dense, gravelly sand with silt and clay (SM), sand is fine grained, gravel <1" sub rounded to angular.	trash	hydrocarbon odor	none observed	olive gray

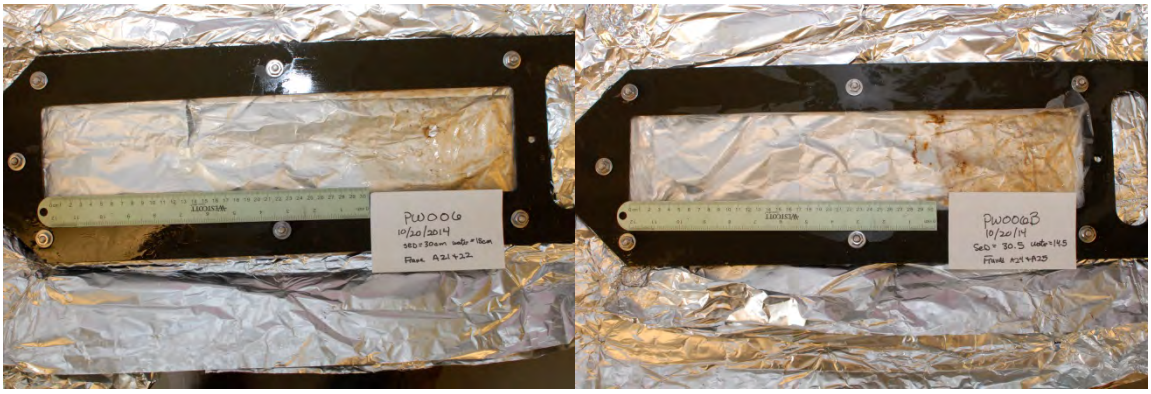
Note: Grain size values presented in parenthesis represent the estimated percent fines, sand, and gravel. For example, (90, 0, 10) would be read as 90% fines, 0% sands, and 10% gravel.

Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW005	RM11E PW005 - SED	4	✓	✓	✓	✓	✓		

PW006 PE and Sediment Processing Log

Passive Sampler Log and Samples. PE intact. Measured sediment and water exposure intervals, and sample IDs, reported below.



Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW006	A	30	15	Sediment - PWP006 A	2	✓	✓	
				Water – PWW006 A	2	✓	✓	
	B	29	16	Sediment - PWP006 B	1		✓	
				Water – PWW006 B	1		✓	

Sediment Log

Station	Drive Length (ft)[a]	Recovery Length (ft)[a]	Percent Recovery	Sample Start Depth (cm)	Sample End Depth (cm)	Sediment Type and Description (Horizon from top of sampler)	Debris	Odor (PID)	Sheen	Color
RM11E-PW006-Sed	2.7	2.4	89%	0	30.5	(0 cm - 30 cm) Medium stiff, olive gray, moist, silt with some clay (ML), homogenous gravel lense at 30 cm (1/4-1" sub rounded), glass in gravel layer.	glass	organic odor	none observed	olive gray

Sediment Samples

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW006	RM11E PW006 - SED	4	✓	✓	✓	✓	✓	✓	

PW007 PE Processing Log

Passive Sampler Log and Samples. Only one PSD at PW007. The PE is intact, but most of the exposure was in the water column. Measured sediment and water exposure intervals, and sample IDs, reported below.

Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW007	A	---	37 - 28	Sediment - PWP007 A	1	✓		
				Water – PWW007 A	1	✓		

Sediment Log: There is no sediment sample at this location.

PE Sample Inventory

Porewater Station	Sampler	Sediment Exposure (cm)	Water Exposure (cm)	Sample ID	Number of Containers	PCB Congeners	Archive	MIT
PW001	A	30	15	Sediment - PWP001 A	2	✓		✓
				Water – PWW001 A	2	✓		✓
	B	30	15	Sediment - PWP001 B	2		✓	
				Water – PWW001 B	2		✓	
PW002	A	28	17	Sediment - PWP002 A	2	✓	✓	
				Water – PWW002 A	2	✓	✓	
	B	27	19	Sediment - PWP002 B	1		✓	
				Water – PWW002 B	1		✓	
PW003	A	28	17	Sediment - PWP003 A	2	✓	✓	
				Water – PWW003 A	2	✓	✓	
	B	25	20	Sediment - PWP003 B	1		✓	
				Water – PWW003 B	1		✓	
PW004	A	29.5	15.5	Sediment - PWP004 A	2	✓		✓
				Water – PWW004 A	2	✓		✓
	B	29	16	Sediment - PWP004 B	1		✓	
				Water – PWW004 B	1		✓	
PW005	A	32	13	Sediment - PWP005 A	2	✓	✓	
				Water – PWW005 A	2	✓	✓	
	B	31	14	Sediment - PWP005 B	1		✓	
				Water – PWW005 B	1		✓	
PW006	A	30	15	Sediment - PWP006 A	2	✓	✓	
				Water – PWW006 A	2	✓	✓	
	B	29	16	Sediment - PWP006 B	1		✓	
				Water – PWW006 B	1		✓	
PW007	A	---	37 - 28	Sediment - PWP007 A	1	✓		
				Water – PWW007 A	1	✓		
PW504	Field Replicate			Sediment - PWP504	1	✓		
				Water – PWW504	1	✓		

Sediment Sample Inventory

Porewater Station	Sample ID	Number of Containers	PCB Congeners	Aroclors	Total Organic Carbon	Black Carbon	Grain Size	Archive	MIT
PW001	RM11E PW001 - SED	5	✓	✓	✓	✓	✓	✓	✓
PW002	RM11E PW002 - SED	6	✓	✓	✓	✓	✓	✓	
PW003	RM11E PW003 - SED	4	✓	✓	✓	✓	✓		
PW004	RM11E PW004 - SED	6	✓	✓	✓	✓	✓		✓
PW005	RM11E PW005 - SED	4	✓	✓	✓	✓	✓		
PW006	RM11E PW006 - SED	4	✓	✓	✓	✓	✓	✓	
PW504	RM11E PW504 - SED	7	✓	✓	✓	✓	✓		

Appendix F

Data Validation Report

Data Validation Report

PCBs in Sediment Porewater Study
River Mile 11 East Project Area, Willamette River
Portland, Oregon

Laboratory SDG Numbers:

K1408725
K1411748
K1411753
K1501568

Prepared for:

Science and Engineering for the Environment, LLC.
4401 Latona Ave NE
Seattle, WA 98105

Prepared by:

Pyron Environmental, Inc.
3530 32nd Way NW
Olympia, WA 98502

Approved By: _____ Date: *April 17, 2015*
Mingta Lin

ACRONYMS

BC	black carbon
%D	percent difference
%D_f	percent drift
%R	percent recovery
%RSD	percent relative standard deviation
CCV	continuing calibration verification
CCVL	continuing calibration verification recovery biased low
CLP	U.S. EPA Contract Laboratory Program
COC	chain-of-custody
CS1	the first calibration standard
CS3	the third calibration standard
EDL	estimated detection limit
EMPC	estimated maximum possible concentration
EPA	U.S. Environmental Protection Agency
GC/ECD	gas chromatography /electron capture detector
HRGC/ HRMS	high-resolution gas chromatography/high-resolution mass spectrometry
ICAL	initial calibration
IPR	initial precision and recovery
LCL	lower control limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
m/z	mass-to-charge ratio
MB	method blank
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
MSDH	matrix spike and matrix spike duplicate recovery biased high
NFGs	CLP National Functional Guidelines for Data Review (EPA 2014a and EPA 2014b)
ng/kg	nanogram per kilogram
OPR	ongoing precision and recovery
OVER ICAL	reported sample result exceeded instrument calibration range
PCB	polychlorinated biphenyl
PE	polyethylene
PFK	perfluorokarosene

QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RF	response factor
RM11E	River Mile 11 East
RPD	relative percent difference
RRT	relative retention time
S/N	signal-to-noise ratio
SAP	sampling and analysis plan
SDG	sample delivery group
SICP	selected ion current profile
T0	**time-zero**
TF	**time-final**
TF-P	**sediment exposed time-final (porewater)**
TF-W	**water exposed time-final (surface water)**

INTRODUCTION

This report presents and discusses findings of the data validation performed on analytical data for samples prepared/collected in August/October 2014 for the referenced project. The laboratory reports validated herein were submitted by ALS Environmental, Inc. (ALS), assigned ALS sample delivery group (SDG) numbers: K1408725, K1411748, K1411753, and K1501568.

A Stage 2B validation (as defined in EPA 2009) was performed on inorganic data (*i.e.,* total organic carbon, black carbon, total solids, and grain size); a Stage 4 validation was performed on PCB Aroclors and PCB congener data. The validation followed guidance specified by EPA (2009, 2011, 2014a, 2014b, and 2014c), with modifications to accommodate project and analytical method requirements. The numerical quality assurance/quality control (QA/QC) criteria applied to the validation were in accordance with method requirements and the current performance-based control limits established by the laboratory (laboratory control limits). Instrument calibration, frequency of QC analyses, and analytical sequence requirements were evaluated against the respective analytical methods.

Validation findings are discussed in each section pertinent to the QC parameter for each type of analysis. Qualified data with applied data qualifiers are summarized in the **Summary** section at the end of this report. Samples and the associated analyses validated herein are summarized as follows:

Field Sample ID	Laboratory ID	Sampling Date	Matrix	Analysis		
				PCB Congeners	PCB Aroclors	Conventionals
RM11E-PW001A T0	K1408725-001	08/17/14	PE	X(A)		
RM11E-PW002A T0	K1408725-003	08/17/14	PE	X(A)		
RM11E-PW003A T0	K1408725-005	08/17/14	PE	X(A)		
RM11E-PW004A T0	K1408725-007	08/17/14	PE	X(A)		
RM11E-PW005A T0	K1408725-009	08/17/14	PE	X(A)		
RM11E-PW006A T0	K1408725-011	08/17/14	PE	X(A)		
RM11E-W007A T0	K1408725-013	08/17/14	PE	X(A)		
RM11E-PWW007 T0	K1411748-001	10/20/14	PE	X		
RM11E-PWW006A	K1411748-003	10/20/14	PE	X		
RM11E-PWP006A	K1411748-004	10/20/14	PE	X		
RM11E-PWW005A	K1411748-009	10/20/14	PE	X		
RM11E-PWP005A	K1411748-010	10/20/14	PE	X		
RM11E-PWW004B	K1411748-013	10/20/14	PE	X		
RM11E-PWP004B	K1411748-014	10/20/14	PE	X		
RM11E-PWW003A	K1411748-017	10/20/14	PE	X		

Field Sample ID	Laboratory ID	Sampling Date	Matrix	Analysis		
				PCB Congeners	PCB Aroclors	Conventionals
RM11E-PWP003A	K1411748-018	10/20/14	PE	X		
RM11E-PWW002A	K1411748-023	10/20/14	PE	X		
RM11E-PWP002A	K1411748-024	10/20/14	PE	X		
RM11E-PWW001B	K1411748-025	10/20/14	PE	X		
RM11E-PWP001B	K1411748-026	10/20/14	PE	X		
RM11E-PW001-SED	K1411753-001	10/20/14	Sediment	X	X	X
RM11E-PW002-SED	K1411753-002	10/20/14	Sediment	X	X	X
RM11E-PW003-SED	K1411753-003	10/20/14	Sediment	X	X	X
RM11E-PW004-SED	K1411753-004	10/20/14	Sediment	X	X	X
RM11E-PW005-SED	K1411753-005	10/20/14	Sediment	X	X	X
RM11E-PW504-SED	K1411753-006	10/20/14	Sediment	X	X	X
RM11E-PW006-SED	K1411753-007	10/20/14	Sediment	X	X	X
RM11E-PW001B T0	K1501568-001	08/17/14	PE	X[(A)]		
RM11E-PW004B T0	K1501568-002	08/17/14	PE	X[(A)]		
RM11E-PWP504	K1501568-004	10/20/14	PE	X		
RM11E-PWW504	K1501568-003	10/20/14	PE	X		

Notes:
[(A)] – Analyzed for a subset of the full list (209 PCB congeners) analytes only.
X - The analysis was requested and performed on the sample.
PE - Polyethylene film for porewater study passive sampler.
Conventional – Total solids, total organic carbon (TOC), grain size, and black carbon.

Due to multiple revisions made to the laboratory reports (as a result of re-analysis or re-reporting), the following shows cross-reference for laboratory reports in which the samples/analyses were reported:

ALS Service Request Number	RM11E Sample ID	Sample Matrix	Analyte(s)
K1408725.01	RM11E-PW001A T0	Polyethylene (T0)	PCB Congeners
	RM11E-PW002A T0		
	RM11E-PW003A T0		
	RM11E-PW004A T0		
	RM11E-PW005A T0		
	RM11E-PW006A T0		
	RM11E-PW007A T0		
K1411748.02R	RM11E-PWP001B	Polyethylene (TF-P)	
	RM11E-PWP002A		
	RM11E-PWP003A		
	RM11E-PWP004B		

ALS Service Request Number	RM11E Sample ID	Sample Matrix	Analyte(s)
	RM11E-PWP005A		
	RM11E-PWP006A		
	RM11E-PWW001B	Polyethylene (TF-W)	
	RM11E-PWW002A		
	RM11E-PWW003A		
	RM11E-PWW004B		
	RM11E-PWW005A		
	RM11E-PWW006A		
	RM11E-PWW007		
K1411753.02	RM11E-PW001-SED	Surface Sediment	Grain Size, Total Organic Carbon, PCB Congeners, Total Solids, and Black Carbon
	RM11E-PW002-SED		
	RM11E-PW003-SED		
	RM11E-PW004-SED		
	RM11E-PW005-SED		
	RM11E-PW006-SED		
	RM11E-PW504-SED		
K1411753.03	RM11E-PW001-SED	Surface Sediment	PCB Aroclors
	RM11E-PW002-SED		
	RM11E-PW003-SED		
	RM11E-PW004-SED		
	RM11E-PW005-SED		
	RM11E-PW006-SED		
	RM11E-PW504-SED		
K1501568	RM11E-PW001B T0	Polyethylene (T0)	PCB Congeners
	RM11E-PW004B T0		
	RM11E-PWP504	Polyethylene (TF-P)	
	RM11E-PWW504	Polyethylene (TF-W)	

Notes:
PCB: Polychlorinated Biphenyl
T0: Time-Zero
TF: Time-Final
TF-P: Sediment Exposed Time-Final (Porewater)
TF-W: Water Exposed Time-Final (Surface Water)

Analytical methods in respect to analytical parameters validated herein and the laboratory performing the analyses are summarized below:

Parameter	Analytical Method	Laboratory
PCB Congeners	USEPA Method 1668C/ALS SOP	ALS Environmental, Inc., Houston, Texas
PCB Aroclors	SW846 Method 8082A	ALS Environmental, Inc., Kelso, Washington
TOC	PSEP Protocols (Plumb, 1981)	
Grain Size	PSEP Protocols	
Black Carbon	ALS SOP GEN/Gustafsson, *et al.* 2001	ALS Environmental, Inc., Tucson, Arizona

Notes:

1. SW846 Methods - *USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* SW-846, Third Edition, December 1996.
2. USEPA Method 1668C - *Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS*. April 2010.
3. PSEP Protocols - Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound, Puget Sound Water Quality Authority, March 1986.
4. Plumb 1981 - Procedures for Handling and Chemical Analysis of Sediment and Water Samples. Technical Report, EPA/CE-B1-1. U.S. Army Corps of Engineers. Plumb, R.H. 1981.
5. ALS SOP - Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Bio solids and Tissue by Isotope Dilution HRGC/HRMS. ALS Environment, Inc., Houston, Texas. ALS SOP Number: HMS-1668, June 21, 2013.
6. ALS SOP GEN - *Standard Operating Procedure for Sample Preparation for Black Carbon (Soot) in Sediment by Chemothermal Oxidation Pretreatment and Combustion/Thermoconductivity or Infrared Detection*. ALS Environment, Inc., Tucson, Arizona. SOP Number: GEN- GEN- BLACK C SOOT PREP, Revision 1, September, 10, 2010.
7. Gustafsson, *et al*, Evaluation of a Protocol for the Quantification of Black Carbon in Sediments, Global Biogeochemical Cycles, 15, 881-890, 2001.

DATA VALIDATION FINDINGS

1. PCB Congeners by EPA Method 1668C: High-resolution Gas Chromatography and High-resolution Mass Spectrometry (HRGC/HRMS)

PCB Congeners extraction and analyses were initially performed on all samples in October and November, 2014. The results were determined not meeting the project objectives by the project team. The laboratory voluntarily withdrew the data, identified a corrective action plan, and re-extracted/re-analyzed all samples except RM11E-PWW007 (Laboratory ID: K141178-001) in January and February, 2015. The re-extraction/re-analysis could not be performed on sample RM11E-PWW007 due to the lack of additional sample volume. Results for this sample were therefore reported from the initial analysis with proper data qualification and advices to data users as stated in Sections 1.5, 1.7, 1.8, and 1.11 below .

1.1 Sample Management and Holding Times

No anomalies were identified in relation to sample preservation, handling, and transport.

As stated in EPA Method 1668C, there are no demonstrated maximum holding times associated with the PCB congeners in aqueous, solid, semi-solid, tissue, or other sample matrices. The method recommends that samples may be stored for up to one year if stored in the dark at less than 6°C for aqueous samples and at less than -10°C for solid, semi-solid, multi-phase, and tissue samples. Sample extract can be stored for up to one year if stored in the dark at less than -10°C. The samples were extracted and analyzed within the method recommended holding times.

1.2 HRGC/HRMS Instrument Performance Check

The EPA Method 1668C and laboratory criteria for instrument performance checks are as follows:

Mass Spectrometer Resolution: (1) The resolution check should be performed, using perfluorokerosene (PFK) or equivalent standard materials, prior to initial calibration and at the start and end of each 12-hour shift, (2) the resolution should be ≥8,000 throughout the mass range and ≥10,000 resolving power at m/z 330.9792 (or any other significant PFK fragments in the range of 300 to 350), and (3) the deviation between the exact m/z and the theoretical m/z must be less than 5 ppm for monitored isomers.

Column Performance: (1) A combined 209 congener standard should be analyzed prior to initial calibration and continuing calibration verification, (2) peak for congener 34 should be resolved from 23 and peak for congener 187 resolved from 182 peak with a valley of ≤40%, (3) congeners 156 and 157 should co-elute within 2 seconds at their

peak maximum, and (4) the absolute retention time (RT) for congener 209 should be >55 minute for SPB-octyl or an alternate column.

HRGC/HRMS instrument performance checks met the criteria.

1.3 Initial Calibration

The EPA Method 1668C criteria for initial calibration are: (1) a minimum of five standards should be employed for native congeners and labeled compounds, (2) the percent relative standard deviation (%RSD) of isomer response should be ≤20%, (3) the ion abundance ratios should be within the control limits listed in EPA Method 1668C, Table 8, (4) the signal-to-noise (S/N) ratio should be >10 for all native and labeled compounds in the first calibration standard (CS1), and (5) response factor (RF) should be determined using one-point calibration for congeners quantitated with internal standard method. Initial calibrations met the criteria.

1.4 Calibration Verification

The EPA Method 1668C criteria require that: (1) continuing calibration verifications be performed at the beginning of each 12-hour shift using the mid-point calibration standard (CS3), (2) the %D value should be within the control limits listed in EPA Method 1668C, Table 6, and (3) the ion abundance ratios, retention times, relative retention times, and S/N ratios should meet the same criteria as for initial calibrations. All calibration verification analyses met the criteria.

1.5 Method Blanks

A method blank was prepared and analyzed as required for each preparation batch. A number of target compounds were detected at levels greater than their estimated detection limits (EDLs) or method reporting limits (MRLs) in method blanks. Sample results less than two times the level found in the method blank were qualified (U) as non-detects at the reported concentrations. Results greater than 2x but less than 5x the levels found in the method blank were qualified (J) as estimated. Results greater than 5x the level found in the method blank were considered not affected and no data qualifiers were assigned. Data affected by detections in method blanks were qualified as presented below:

Method Blank ID	Analyte	Blank Result	Affected Sample	Original Result	Qualified Result	Unit
EQ1400690-01	PCB 1	239	RM11E-PWW007	133	**133 U**	ng/kg
	PCB 3	58.3 J		22.2 J	**22.2 U**	
	PCB 4	7140		4070	**4070 U**	
	PCB 6	55.8 J		53.4	**53.4 U**	
	PCB 8	172		115	**115 U**	
	PCB 10	559		286	**286 U**	

Method Blank ID	Analyte	Blank Result	Affected Sample	Original Result	Qualified Result	Unit
	PCB 11	146 J		619	**619 J**	
	PCBs 12 + 13	60.2 J		50.4 J	**50.4 U**	
	PCB 15	260		193	**193 U**	
	PCB 17	1420		790	**790 U**	
	PCB 18	74.8 J		74.0 J	**74.0 U**	
	PCB 19	8550		4370	**4370 U**	
	PCBs 20 + 28	42600		114000	**114000 J**	
	PCB 25	186		206	**206 U**	
	PCB 27	1070		597	**597 U**	
	PCB 30	334		313	**313 U**	
	PCB 31	181		340	**340 J**	
	PCB 32	935		310	**310 U**	
	PCBs 45 + 51	2470		964	**964 U**	
	PCB 49	3510		4490	**4490 J**	
	PCBs 50 + 53	2890		1390	**1390 U**	
	PCB 52	3130		2740	**2740 U**	
	PCB 84	307		656	**656 J**	
	PCB 91	1140		1050	**1050 U**	
	PCB 94	205		156	**156 U**	
	PCBs 95 + 100	3070		4060	**4060 U**	
	PCB 96	208		231	**231 U**	
	PCBs 98 + 102	233 J		227 J	**227 U**	
	PCB 103	501		390	**390 U**	
	PCB 104	83.8		203	**203 J**	
	PCB 107	120 J		271	**271 J**	
	PCB 118	558		1940	**1940 J**	
	PCBs 129 + 138 + 163	7860		7210	**7210 U**	
	PCBs 135 + 154	754		1110	**1110 U**	
	PCB 136	1310		1320	**1320 U**	
	PCB 144	315		360	**360 U**	
	PCBs 147 + 149	5910		5690	**5690 U**	
	PCB 148	32.9 J		19.4 J	**19.4 U**	
	PCB 150	96.9 J		60.2 J	**60.2 U**	
	PCB 151	3160		3220	**3220 J**	
	PCBs 156 + 157	583		516	**516 U**	
	PCB 159	112 J		91.0	**91.0 U**	
	PCB 167	230		210	**210 U**	
	PCB 170	4450		3100	**3100 U**	
	PCBs 171 + 173	1300		971	**971 U**	
	PCB 172	668		489	**489 U**	
	PCB 174	3790		2930	**2930 U**	
	PCB 177	2420		1850	**1850 U**	
	PCBs 180 + 193	8620		6340	**6340 U**	
	PCB 183	2320		1490	**1490 U**	
	PCB 185	290 J		290	**290 U**	
	PCB 187	4390		2980	**2980 U**	
	PCB 189	185		113	**113 U**	
	PCB 190	977		710	**710 U**	
	PCB 191	215		129	**129 U**	
	PCB 194	2110		1410	**1410 U**	

Method Blank ID	Analyte	Blank Result	Affected Sample	Original Result	Qualified Result	Unit
	PCB 195	932		575	**575 U**	
	PCB 196	1220		828	**828 U**	
	PCB 197	93.8 J		55.4 J	**55.4 U**	
	PCBs 198 + 199	1630		1470	**1470 U**	
	PCB 200	232 J		160	**160 U**	
	PCB 201	197		158	**158 U**	
	PCB 202	244		374	**374 U**	
	PCB 203	1030		757	**757 U**	
	PCB 205	123		67.2	**67.2 U**	
	PCB 206	354		283	**283 U**	
	PCB 207	73.9 J		40.2 J	**40.2 U**	
	PCB 208	59.4 J		58.7	**58.7 U**	
EQ1500023-01	Total Hexa-CB	28500	RM11E-PWW001B RM11E-PWW003A	87100 94400	**87100 J** **94400 J**	ng/kg

1.6 Initial Precision and Recovery Study (IPR) and Ongoing Precision and Recovery (OPR)

IPR study results were not included in the data package. The laboratory stated that the results were maintained at the laboratory.

The laboratory performed laboratory control sample (LCS) and LCS duplicate (LCSD) analyses in lieu of OPR. See Section 1.7.

1.7 Laboratory Control Sample (LCS) and LCS Duplicate (LCSD)

The percent recovery (%R) values for a number of target compounds in the LCS and LCSD associated with sample RM11E-PWW007 (Laboratory ID: K141178-001) were greater than the upper control limits. These compounds were affected by the detections in the method blank and the associated labeled compounds biased low (see Sections 1.5 and 1.8); no further data qualifying action was taken herein.

The %R and relative percent difference (RPD) values in all LCS/LCSD associated with other samples were within the method control limits (EPA Method 1668C, Table 6).

1.8 Labeled Compound Recovery

Labeled compounds were added to all field and laboratory QC samples as required by the method. The %R values met the method requirements (EPA Method 1668C, Table 6).

Note that the %R values in sample RM11E-PWW007 (Laboratory ID: K141178-001) generally biased low (although within the method criteria and therefore not qualified), which translated to a potentially biased-high results for this sample. Data users are advised to take this into consideration while using these results for the study.

1.9 Target Compound Identification

Target compound identification was evaluated by examining if: (1) the signals for the two exact m/z's being monitored were present, and maximized within ±2 seconds of one another, (2) the S/N ratio of each of the two exact m/z's must be greater than or equal to 2.5, (3) the ion abundance ratios were within the method control limits (EPA Method 1668C, Table 8), and (4) the relative retention time (RRT) or retention time (RT) of the peaks were within the method control limits (EPA Method 1668C, Table 2) or laboratory control limits.

No anomalies were found in relation to target compound identified, except that a number of detections did not meet the method criteria for ion abundance ratios; these results were qualified (J) as estimated, as summarized in **SUMMARY, Table I.**

1.10 Reporting Limits, Estimated Detection Limits (EDLs) and Compound Quantitation

Correct internal standards, quantitation ions, and average RFs were used to quantitate target compound detections. The MRLs were supported with adequate ICAL calibration concentrations. Sample-specific EDLs were adjusted with sample weights, internal standard peak height, and noise levels as required by the method. In general, sample-specific MRLs were significantly elevated (from the project goal for quantitation limits) due to the high PCB congener concentrations in samples. Samples required dilutions for proper instrument analyses and the MRLs were therefore elevated proportionally. The project goal for quantitation limits were attained to in these cases.

Reported results for one or two PCB congeners in selected samples exceeded the instrument calibration ranges; the results were qualified (J) as estimated as presented in **SUMMARY, Table I**.

A verification calculation was performed on 10% of the reported calibration, laboratory QC analyses, and sample results. No anomalies were found. The verification calculation worksheets were maintained in project files for requests.

1.11 Overall Assessment of PCB Congener Data Usability

Results for sample RM11E-PWW007 (Laboratory ID: K141178-001) were affected by the detections in the method blank and the biased-low labeled compound recovery (see Sections 1.5 and 1.8); the results might potentially bias high. Data users are advised to take this into consideration while using these data for the study.

PCB congener data were of known quality and acceptable for use, as qualified.

2. PCB Aroclors by EPA Method SW8082A: Gas Chromatography and Electron Capture Detector (GC/ECD)

2.1 Sample Management and Holding Times

No anomalies were identified in relation to sample preservation, handling, and transport.

Sediment samples should be extracted within 14 days (one year if frozen at <-20°C) of collection. Extracts should be analyzed within 40 days of extraction. All samples were extracted and analyzed within the required holding times.

2.2 Initial Calibration

The method requires that (1) a minimum of 5-point calibration be performed using the mixture of Aroclor 1016 and 1260, (2) a single-point calibration be performed for the other five Aroclors to establish calibration factors (CFs) and for Aroclor pattern recognition, (3) at least 3 peaks (preferably 5 peaks) must be chosen for each Aroclor for characterization, (4) the %RSD values of Aroclor 1016 and 1260 CFs must be ≤20%, and (5) if dual column analysis is chosen, both columns should meet the requirements.

A second source standard (ICV) should be analyzed immediately after the last initial calibration standard; the %D values for target and surrogate compounds should meet the method requirements. The initial calibrations met the requirements.

2.3 Calibration Verification

CCV analyses should be performed for each 12-hour analysis sequence prior to sample analyses, and the %D be within ±20%. Calibration verifications were performed at the required frequency. All %D values met the control criteria, except for the following:

CCV File ID	Analyte	CCV %R	Control Limit	Bias	Affected Sample	Data Qualifier
0305F005.D 0305F012.D Column: DB-XLB	Aroclor 1016	-21% -21%	±20%	Low	RM11E-PW001-SED	**UJ**

2.4 Method Blanks

Method blanks were prepared and analyzed as required. PCB Aroclors were not detected at or above the MDLs in the method blanks.

2.5 Surrogate Spikes

Surrogate spikes were added to all samples as required by the method. All surrogate spike %R values were within the project control limits.

2.6 Matrix Spike and Matrix Spike Duplicate (MS/MSD)

MS/MSD analyses were performed on project samples as required. All %R and RPD values met the project control criteria, except for the following:

Spiked Sample ID	Analyte	MS %R	MSD %R	Control Limit	RPD	Affected Sample	Data Qualifier
RM11E-PW001-SED	Aroclor 1260	68%	291%	24-148%	92%	RM11E-PW001-SED	**J**

Note: RPD criteria is ≤30%.

2.7 Laboratory Control Sample (LCS)

LCS analyses were performed as required by the method. The LCS %R values were within the project control limits.

2.8 Method Reporting Limits and Target Compound Quantitation

The sample-specific MDLs and MRLs were adjusted with sample amount extracted and moisture content. RLs were supported with adequate initial calibration concentrations and achieved the project target quantitation limits. MRLs were elevated for most of the non-detected Aroclors in samples due to matrix interference and deviation of Aroclor chromatographic fingerprint. See discussion in Section 2.9. The project goal for quantitation limits were attained to in these cases.

Verification calculations were performed on 10% of the instrument calibration, calibration verifications, and reported QC and sample analyses. No anomalies were found. Sample quantitation and reporting was correctly performed.

2.9 Target Compound Identification

No anomalies were found in relation to PCB Aroclor identification.

The chromatograms for most sediment samples indicated the presence of PCB congeners and potential non-target matrix interferences that spanned the entire elution range of the analytical run. The later-eluting peaks in the samples presented a good qualitative pattern match with good quantitative agreement between the columns for Aroclor 1260. The presence of the non-target background interferences prevented

definitive identification of the earlier-eluting Aroclors (*e.g.,* 1221, 1232, 1242, 1248, and 1254). These response peaks did not meet the laboratory qualitative criteria for identification (i.e., pattern matching for specific Aroclors), and posed poor quantitative agreement between the responses measured on both analytical columns (PRD value significantly >40%). Because the presence of the earlier-eluting Aroclors could be neither confirmed nor ruled out, the laboratory chose to elevate the associated detection limits to the levels of the interferences for those Aroclors, and qualified the results (Ui). Data user are advised to take this into consideration while using these data for this study.

2.10 Overall Assessment of PCB Aroclors Data Usability

PCB Aroclor data are of known quality and acceptable for use, as qualified.

3. Conventionals (Total Solids, Total Organic Carbon, Grain Size, and Black Carbon [BC])

3.1 Sample Management and Holding Time

No anomalies were identified in relation to sample preservation, handling, and transport.

Sediment samples should be analyzed within 6 months for TS, TOC (both frozen at -20°C) and grain size. No maximum holding time was established for black carbon analysis. All samples were analyzed within the required holding times.

3.2 Instrument Calibration

The initial calibrations were established for TOC and BC analyses using one blank and at least five levels of standards. The correlation coefficients (r) of the initial calibration curves were ≥0.995, and met the method criteria.

3.3 Calibration Verification

ICV and CCV analyses were performed for TOC and BC as required by the methods. All ICV and CCV %R values were within the laboratory control limits (90 – 110%).

3.4 Blanks

Calibration Blanks: ICBs and CCBs were analyzed for TOC and BC as required by the methods. No target analytes were positively reported in ICBs and CCBs at or above the MDLs.

Method Blanks: Method blanks were prepared and analyzed for TOC and BC as required by the methods. No target analytes were detected at or above the RLs in method blanks.

3.5 Laboratory Replicate Analyses

Laboratory duplicate analyses were performed on project samples as requested. The RPD and %RSD values were within the project control criteria.

3.6 Matrix Spike (MS)

MS analyses were performed on project samples as requested. The %R values were within the laboratory control limits.

3.7 Laboratory Control Samples (LCS)

LCS analyses were performed as required by the methods. All LCS %R values were within the laboratory control limits.

3.8 Method Reporting Limits (MRLs)

The MRLs were supported with adequate initial calibration concentrations. Sample-specific MRLs achieved the project requirements for quantitation limits.

3.9 Overall Assessment of Conventional Parameters Data Usability

Conventional parameters data are of known quality and acceptable for use.

SUMMARY

Table I. Qualified Data – Affected by QC Anomalies

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1408725-001	RM11E-PW001A T0	PCB 54	J	OVER ICAL
K1408725-003	RM11E-PW002A T0	PCB 54	J	OVER ICAL
K1408725-005	RM11E-PW003A T0	PCB 54	J	OVER ICAL
K1408725-007	RM11E-PW004A T0	PCB 54	J	OVER ICAL
K1408725-009	RM11E-PW005A T0	PCB 54	J	OVER ICAL
K1408725-011	RM11E-PW006A T0	PCB 54	J	OVER ICAL
K1408725-013	RM11E-PW007A T0	PCB 54	J	OVER ICAL
K1411748-024	RM11E-PWP002A	PCB 170	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 16	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 159	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 175	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 206	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 92	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 176	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 167	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 172	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 195	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 134	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 104	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 148	J	EMPC
K1411748-024	RM11E-PWP002A	PCB 158	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 209	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 202	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 197	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 80	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 155	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 16	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 189	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 175	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 201	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 206	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 167	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 203	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 195	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 120	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 48	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 68	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-014	RM11E-PWP004B	PCB 191	J	EMPC
K1411748-014	RM11E-PWP004B	PCB 205	J	EMPC
K1411748-014	RM11E-PWP004B	PCBs 59 + 62 + 75	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 1	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 202	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 60	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 80	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 170	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 18	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 22	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 175	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 190	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 58	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 64	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 84	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 172	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 208	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 185	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 104	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 164	J	EMPC
K1411748-010	RM11E-PWP005A	PCB 191	J	EMPC
K1411748-010	RM11E-PWP005A	PCBs 21 + 33	J	EMPC
K1411748-010	RM11E-PWP005A	PCBs 59 + 62 + 75	J	EMPC
K1411748-010	RM11E-PWP005A	PCBs 171 + 173	J	EMPC
K1411748-010	RM11E-PWP005A	PCBs 198 + 199	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 209	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 202	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 194	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 42	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 128	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 19	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 32	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 175	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 56	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 58	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 64	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 84	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 200	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 172	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 195	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-023	RM11E-PWW002A	PCB 104	J	EMPC
K1411748-023	RM11E-PWW002A	PCB 96	J	EMPC
K1411748-023	RM11E-PWW002A	PCBs 98 + 102	J	EMPC
K1411748-023	RM11E-PWW002A	PCBs 135 + 154	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 209	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 105	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 80	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 30	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 194	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 175	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 206	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 56	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 46	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 196	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 64	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 84	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 167	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 203	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 195	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 185	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 150	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 96	J	EMPC
K1411748-013	RM11E-PWW004B	PCB 148	J	EMPC
K1411748-013	RM11E-PWW004B	PCBs 171 + 173	J	EMPC
K1411748-013	RM11E-PWW004B	PCBs 198 + 199	J	EMPC
K1411748-013	RM11E-PWW004B	PCBs 40 + 71	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 209	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 105	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 80	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 42	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 190	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 58	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 146	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 64	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 177	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 195	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 141	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 185	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 96	J	EMPC
K1411748-009	RM11E-PWW005A	PCB 94	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-009	RM11E-PWW005A	PCB 164	J	EMPC
K1411748-009	RM11E-PWW005A	PCBs 59 + 62 + 75	J	EMPC
K1411748-009	RM11E-PWW005A	PCBs 98 + 102	J	EMPC
K1411748-009	RM11E-PWW005A	PCBs 83 + 99	J	EMPC
K1411748-009	RM11E-PWW005A	PCBs 156 + 157	J	EMPC
K1411748-009	RM11E-PWW005A	PCBs 171 + 173	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 30	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 52	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 42	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 136	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 27	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 56	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 151	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 104	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 103	J	EMPC
K1411748-026	RM11E-PWP001B	PCB 96	J	EMPC
K1411748-026	RM11E-PWP001B	PCBs 45 + 51	J	EMPC
K1411748-026	RM11E-PWP001B	PCBs 135 + 154	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 118	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 30	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 194	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 18	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 132	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 16	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 56	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 84	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 151	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 179	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 177	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 203	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 141	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 185	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 104	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 103	J	EMPC
K1411748-018	RM11E-PWP003A	PCB 144	J	EMPC
K1411748-018	RM11E-PWP003A	PCBs 59 + 62 + 75	J	EMPC
K1411748-018	RM11E-PWP003A	PCBs 98 + 102	J	EMPC
K1411748-018	RM11E-PWP003A	PCBs 171 + 173	J	EMPC
K1411748-018	RM11E-PWP003A	PCBs 180 + 193	J	EMPC
K1411748-018	RM11E-PWP003A	PCBs 198 + 199	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-018	RM11E-PWP003A	PCBs 70 + 74 + 76	**J**	EMPC
K1411748-018	RM11E-PWP003A	PCBs 40 + 71	**J**	EMPC
K1411748-018	RM11E-PWP003A	PCBs 135 + 154	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 202	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 52	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 18	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 136	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 201	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 196	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 187	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 183	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 177	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 167	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 200	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 172	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 195	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 141	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 185	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCB 103	**J**	EMPC
K1411748-004	RM11E-PWP006A	PCBs 156 + 157	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCB 54	**J**	EMPC
K1411748-025	RM11E-PWW001B	HexaCBTOT	**J**	MB
K1411748-025	RM11E-PWW001B	PCB 151	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCB 187	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCBs 45 + 51	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCBs 59 + 62 + 75	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCBs 90 + 101 + 113	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCBs 129 + 138 + 163	**J**	EMPC
K1411748-025	RM11E-PWW001B	PCBs 95 + 100	**J**	EMPC
K1411748-017	RM11E-PWW003A	HexaCBTOT	**J**	MB
K1411748-017	RM11E-PWW003A	PCB 151	**J**	EMPC
K1411748-017	RM11E-PWW003A	PCB 141	**J**	EMPC
K1411748-017	RM11E-PWW003A	PCBs 45 + 51	**J**	EMPC
K1411748-017	RM11E-PWW003A	PCBs 129 + 138 + 163	**J**	EMPC
K1411748-017	RM11E-PWW003A	PCBs 135 + 154	**J**	EMPC
K1411748-001	RM11E-PWW007	PCB 4	**U**	MB
K1411748-001	RM11E-PWW007	PCB 31	**U**	MB
K1411748-001	RM11E-PWW007	PCB 11	**J**	MB
K1411748-001	RM11E-PWW007	PCB 15	**U**	MB
K1411748-001	RM11E-PWW007	PCB 1	**U**	MB

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-001	RM11E-PWW007	PCB 3	**U**	MB
K1411748-001	RM11E-PWW007	PCB 202	**J**	MB
K1411748-001	RM11E-PWW007	PCB 6	**U**	MB
K1411748-001	RM11E-PWW007	PCB 118	**J**	MB
K1411748-001	RM11E-PWW007	PCB 60	**J**	EMPC
K1411748-001	RM11E-PWW007	PCB 197	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 10	**U**	MB
K1411748-001	RM11E-PWW007	PCB 80	**J**	EMPC
K1411748-001	RM11E-PWW007	PCB 8	**U**	MB
K1411748-001	RM11E-PWW007	PCB 170	**U**	MB
K1411748-001	RM11E-PWW007	PCB 30	**U**	MB
K1411748-001	RM11E-PWW007	PCB 52	**U**	MB
K1411748-001	RM11E-PWW007	PCB 194	**U**	MB
K1411748-001	RM11E-PWW007	PCB 18	**U**	MB
K1411748-001	RM11E-PWW007	PCB 17	**U**	MB
K1411748-001	RM11E-PWW007	PCB 136	**U**	MB
K1411748-001	RM11E-PWW007	PCB 174	**U**	MB
K1411748-001	RM11E-PWW007	PCB 19	**U**	MB
K1411748-001	RM11E-PWW007	PCB 27	**U**	MB
K1411748-001	RM11E-PWW007	PCB 32	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 16	**J**	EMPC
K1411748-001	RM11E-PWW007	PCB 189	**U**	MB
K1411748-001	RM11E-PWW007	PCB 159	**U**	MB
K1411748-001	RM11E-PWW007	PCB 201	**U**	MB
K1411748-001	RM11E-PWW007	PCB 206	**U**	MB
K1411748-001	RM11E-PWW007	PCB 190	**U**	MB
K1411748-001	RM11E-PWW007	PCB 49	**U**	MB
K1411748-001	RM11E-PWW007	PCB 196	**U**	MB
K1411748-001	RM11E-PWW007	PCB 84	**J**	MB
K1411748-001	RM11E-PWW007	PCB 151	**U**	MB
K1411748-001	RM11E-PWW007	PCB 187	**U**	MB
K1411748-001	RM11E-PWW007	PCB 183	**U**	MB
K1411748-001	RM11E-PWW007	PCB 177	**U**	MB
K1411748-001	RM11E-PWW007	PCB 167	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 200	**U**	MB
K1411748-001	RM11E-PWW007	PCB 172	**U**	MB
K1411748-001	RM11E-PWW007	PCB 203	**U**	MB
K1411748-001	RM11E-PWW007	PCB 208	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 195	**U**	MB
K1411748-001	RM11E-PWW007	PCB 207	**U**	MB

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411748-001	RM11E-PWW007	PCB 185	**J**	MB
K1411748-001	RM11E-PWW007	PCB 25	**U**	MB
K1411748-001	RM11E-PWW007	PCB 104	**J**	MB
K1411748-001	RM11E-PWW007	PCB 103	**U**	MB
K1411748-001	RM11E-PWW007	PCB 91	**U**	MB
K1411748-001	RM11E-PWW007	PCB 150	**U**	MB
K1411748-001	RM11E-PWW007	PCB 144	**U**	MB
K1411748-001	RM11E-PWW007	PCB 107	**J**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 96	**U**	MB
K1411748-001	RM11E-PWW007	PCB 94	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 148	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCB 191	**U**	MB
K1411748-001	RM11E-PWW007	PCB 205	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 12 + 13	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 20 + 28	**J**	MB
K1411748-001	RM11E-PWW007	PCBs 50 + 53	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 45 + 51	**U**	MB, EMPC
K1411748-001	RM11E-PWW007	PCBs 98 + 102	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 156 + 157	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 171 + 173	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 180 + 193	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 198 + 199	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 147 + 149	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 129 + 138 + 163	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 95 + 100	**U**	MB
K1411748-001	RM11E-PWW007	PCBs 135 + 154	**U**	MB
K1411748-003	RM11E-PWW006A	PCB 170	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCB 132	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCB 174	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCB 19	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCB 187	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCB 177	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 50 + 53	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 45 + 51	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 59 + 62 + 75	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 90 + 101 + 113	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 83 + 99	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 147 + 149	**J**	EMPC
K1411748-003	RM11E-PWW006A	PCBs 129 + 138 + 163	**J**	EMPC
K1411753-001	RM11E-PW001-SED	PCB 77	**J**	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411753-001	RM11E-PW001-SED	PCB 60	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 197	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 42	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 159	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 56	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 46	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 82	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 167	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 172	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 207	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 185	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 121	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 126	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 85	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 144	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 96	J	EMPC
K1411753-001	RM11E-PW001-SED	PCB 94	J	EMPC
K1411753-001	RM11E-PW001-SED	PCBs 59 + 62 + 75	J	EMPC
K1411753-001	RM11E-PW001-SED	PCBs 98 + 102	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 1	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 2	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 3	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 77	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 37	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 159	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 72	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 79	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 208	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 126	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 144	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 68	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 164	J	EMPC
K1411753-002	RM11E-PW002-SED	PCB 188	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 77	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 137	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 27	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 189	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 175	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 84	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 130	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411753-003	RM11E-PW003-SED	PCB 25	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 104	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 126	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 107	J	EMPC
K1411753-003	RM11E-PW003-SED	PCB 148	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 3	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 77	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 105	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 169	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 155	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 137	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 19	J	OVER ICAL
K1411753-004	RM11E-PW004-SED	PCB 159	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 175	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 84	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 207	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 126	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 85	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 150	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 144	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 68	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 148	J	EMPC
K1411753-004	RM11E-PW004-SED	PCB 165	J	EMPC
K1411753-004	RM11E-PW004-SED	PCBs 21 + 33	J	EMPC
K1411753-004	RM11E-PW004-SED	PCBs 135 + 154	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 60	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 197	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 137	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 17	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 27	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 159	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 175	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 206	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 72	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 46	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 41	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 82	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 200	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 185	J	EMPC
K1411753-005	RM11E-PW005-SED	PCB 25	J	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1411753-005	RM11E-PW005-SED	PCB 126	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 150	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 144	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 48	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 68	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 94	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 165	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCB 191	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCBs 98 + 102	**J**	EMPC
K1411753-005	RM11E-PW005-SED	PCBs 117 + 116	**J**	EMPC
K1411753-007	RM11E-PW006-SED	TetraCBTOT	**U**	MB
K1411753-007	RM11E-PW006-SED	PCB 52	**U**	MB
K1411753-007	RM11E-PW006-SED	PCB 19	**J**	EMPC
K1411753-007	RM11E-PW006-SED	PCBs 44 + 47 + 65	**U**	MB
K1411753-006	RM11E-PW504-SED	PCB 209	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 3	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 77	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 105	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 169	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 155	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 19	**J**	OVER ICAL
K1411753-006	RM11E-PW504-SED	PCB 16	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 127	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 72	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 126	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 144	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 81	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 165	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 181	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 184	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCB 122	**J**	EMPC
K1411753-006	RM11E-PW504-SED	PCBs 108 + 124	**J**	EMPC
K1411753-001	RM11E-PW001-SED	Aroclor 1016	**UJ**	CCVL
K1411753-001	RM11E-PW001-SED	Aroclor 1260	**J**	MSDRH,RPD
K1501568-001	RM11E-PW001B T0	PCB 54	**J**	OVER
K1501568-004	RM11E-PWP504	PCB 197	**J**	EMPC
K1501568-004	RM11E-PWP504	PCB 155	**J**	EMPC
K1501568-004	RM11E-PWP504	PCB 22	**J**	EMPC
K1501568-004	RM11E-PWP504	PCB 162	**J**	EMPC
K1501568-004	RM11E-PWP504	PCB 58	**J**	EMPC

Laboratory Sample ID	Field Sample ID	Analyte	Data Qualifier	Data Qualified Reason
K1501568-004	RM11E-PWP504	PCB 167	J	EMPC
K1501568-004	RM11E-PWP504	PCBs 85 + 116 + 117	J	EMPC
K1501568-003	RM11E-PWW504	PCB 202	J	EMPC
K1501568-003	RM11E-PWW504	PCB 66	J	EMPC
K1501568-003	RM11E-PWW504	PCB 77	J	EMPC
K1501568-003	RM11E-PWW504	PCB 194	J	EMPC
K1501568-003	RM11E-PWW504	PCB 175	J	EMPC
K1501568-003	RM11E-PWW504	PCB 201	J	EMPC
K1501568-003	RM11E-PWW504	PCB 196	J	EMPC
K1501568-003	RM11E-PWW504	PCB 84	J	EMPC
K1501568-003	RM11E-PWW504	PCB 179	J	EMPC
K1501568-003	RM11E-PWW504	PCB 177	J	EMPC
K1501568-003	RM11E-PWW504	PCB 167	J	EMPC
K1501568-003	RM11E-PWW504	PCB 200	J	EMPC
K1501568-003	RM11E-PWW504	PCB 172	J	EMPC
K1501568-003	RM11E-PWW504	PCB 195	J	EMPC
K1501568-003	RM11E-PWW504	PCB 104	J	EMPC
K1501568-003	RM11E-PWW504	PCB 154	J	EMPC
K1501568-003	RM11E-PWW504	PCB 150	J	EMPC
K1501568-003	RM11E-PWW504	PCB 152	J	EMPC
K1501568-003	RM11E-PWW504	PCB 48	J	EMPC
K1501568-003	RM11E-PWW504	PCB 107	J	EMPC
K1501568-003	RM11E-PWW504	PCB 96	J	EMPC
K1501568-003	RM11E-PWW504	PCB 94	J	EMPC
K1501568-003	RM11E-PWW504	PCB 148	J	EMPC
K1501568-003	RM11E-PWW504	PCB 191	J	EMPC
K1501568-003	RM11E-PWW504	PCBs 98 + 102	J	EMPC
K1501568-003	RM11E-PWW504	PCBs 156 + 157	J	EMPC

Notes:

EMPC – The detection did not meet the compound identification criteria, and was reported as "Estimated Maximum Possible Concentration"

MB - The result was affected by the detection of this compound in the associated method blank.

MSDH – Matrix spike and matrix spike duplicate %R values were greater than the upper control limit.

RPD – Relative percent difference value was outside the project control criteria.

CCVL - CCV recovery biased low

OVER ICAL - The reported value exceeded the instrument calibration range.

Table II. Data Qualifier Definition

Data Qualifier	Definition
J	The analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
U	The analyte was analyzed for, but was considered not detected at the reporting limit or reported value.
UJ	The analyte was analyzed for, and the associated quantitation limit was an estimated value.

REFERENCES

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Gustafsson, *et al.* 2001. *Evaluation of a Protocol for the Quantification of Black Carbon in Sediments*. Global Biogeochemical Cycles, 15, 881-890. 2001.

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Appendix G

Data File (Provided as Excel File Only)

Appendix H

ALS Laboratory Reports

Table H-1
Sample and Laboratory Reports Index

Sorted by ALS Service Request Number and Sample ID

ALS Service Request Number	RM11E Sample ID	Sample Matrix	Analyte(s)
K1408725.01	RM11E-PW001A T0	Polyethylene (T0)	PCB Congeners
	RM11E-PW002A T0		
	RM11E-PW003A T0		
	RM11E-PW004A T0		
	RM11E-PW005A T0		
	RM11E-PW006A T0		
	RM11E-PW007A T0		
K1411748.02R	RM11E-PWP001B	Polyethylene (TF-P)	
	RM11E-PWP002A		
	RM11E-PWP003A		
	RM11E-PWP004B		
	RM11E-PWP005A		
	RM11E-PWP006A		
	RM11E-PWW001B	Polyethylene (TF-W)	
	RM11E-PWW002A		
	RM11E-PWW003A		
	RM11E-PWW004B		
	RM11E-PWW005A		
	RM11E-PWW006A		
	RM11E-PWW007		
K1411753.02	RM11E-PW001-SED	Surface Sediment	Grain Size, TOC, PCB Congeners, TS, BC
	RM11E-PW002-SED		
	RM11E-PW003-SED		
	RM11E-PW004-SED		
	RM11E-PW005-SED		
	RM11E-PW006-SED		
	RM11E-PW504-SED		
K1411753.03	RM11E-PW001-SED	Surface Sediment	Aroclors
	RM11E-PW002-SED		
	RM11E-PW003-SED		
	RM11E-PW004-SED		
	RM11E-PW005-SED		
	RM11E-PW006-SED		
	RM11E-PW504-SED		
K1501568	RM11E-PW001B T0	Polyethylene (T0)	PCB Congeners
	RM11E-PW004B T0		
	RM11E-PWP504	Polyethylene (TF-P)	
	RM11E-PWW504	Polyethylene (TF-W)	

Sorted by Sample Matrix and Sample ID

Sample Matrix	RM11E Sample ID	ALS Service Request Number	Analyte(s)
Polyethylene (T0)	RM11E-PW001A T0	K1408725.01	PCB Congeners
	RM11E-PW001B T0	K1501568	
	RM11E-PW002A T0	K1408725.01	
	RM11E-PW003A T0	K1408725.01	
	RM11E-PW004A T0	K1408725.01	
	RM11E-PW004B T0	K1501568	
	RM11E-PW005A T0	K1408725.01	
	RM11E-PW006A T0	K1408725.01	
	RM11E-PW007A T0	K1408725.01	
Polyethylene (TF-P)	RM11E-PWP001B	K1411748.02R	PCB Congeners
	RM11E-PWP002A	K1411748.02R	
	RM11E-PWP003A	K1411748.02R	
	RM11E-PWP004B	K1411748.02R	
	RM11E-PWP005A	K1411748.02R	
	RM11E-PWP006A	K1411748.02R	
	RM11E-PWP504	K1501568	
Polyethylene (TF-W)	RM11E-PWW001B	K1411748.02R	PCB Congeners
	RM11E-PWW002A	K1411748.02R	
	RM11E-PWW003A	K1411748.02R	
	RM11E-PWW004B	K1411748.02R	
	RM11E-PWW005A	K1411748.02R	
	RM11E-PWW006A	K1411748.02R	
	RM11E-PWW007	K1411748.02R	
	RM11E-PWW504	K1501568	
Surface Sediment	RM11E-PW001-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW002-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW003-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW004-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW005-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW006-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors
	RM11E-PW504-SED	K1411753.02	Grain Size, TOC, PCB Congeners, TS, BC
		K1411753.03	Aroclors

Notes:
TS = Total Solids
TOC = Total Organic Carbon
PCB = Polychlorinated Biphenyl
BC = Black Carbon
T0 = Time-Zero
TF = Time-Final
TF-P = Sediment Exposed Time-Final (Porewater)
TF-W = Water Exposed Time-Final (Surface Water)

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November 24, 2014

Analytical Report for Service Request No: K1408725
Revised Service Request No: K1408725.01

Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 98105

RE: RM11E Supplemental RI/FS Investigation

Dear Tim:

Enclosed are the additional results of the samples submitted to our laboratory on August 18, 2014. For your reference, these analyses have been assigned our service request number K1408725.

The results were added for PCB97.

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.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) 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.

We apologize for any inconvenience this may have created.

Please call if you have any questions. My extension is 3316. You may also contact me via Email at Jeff.Christian@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Jeff Christian
Director of Operations - Western U.S.A.

JC/as

REVISED
4:03 pm, Nov 24, 2014

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Chlorinated Biphenyl Congeners

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

November 24, 2014 Service Request No: K1408725

Jeff Christian
ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Results for: Science and Engineering for the Environment, LLC.
Dear Jeff,

Enclosed is the amended report for samples submitted to our laboratory on August 26, 2014. For your reference, these analyses have been assigned our service request number **K1408725.**

This revision was necessary to correct the reporting list. In the original report, PCB 97 was not reported. In the amended report PCB 97 is now reported.

Please replace your original copy of the report with the report enclosed.

Please contact me if you have any questions. My direct number is 281-575-2277.

Respectfully submitted,

for

Jim Plassard
Laboratory Director

ALS Environmental

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

September 25, 2014 Service Request No: K1408725

Jeff Christian.

ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Result for: Science and Engineering for the Environment, LLC.

Dear Jeff:

Enclosed are the results of the sample(s) submitted to our laboratory on August 26, 2014. For Your reference, these analyses have been assigned our service request number: **K1408725**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct line is 281-575-2279. You may also contact me via email at Arthi.Kodur@alsglobal.com

Respectfully submitted,

ALS Group USA Corp., dba ALS Environmental

Arthi Kodur
Project Manager

Page 1 of 981

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment	**Service Request No.:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Received:**	8/26/14
Sample Matrix:	PE Film		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seven PE film samples were received for analysis at ALS Environmental on 8/26/14.

Please note the reporting forms are currently referencing the date ALS Environmental-Kelso received the samples (8/18/14) and not the date ALS Environmental-Houston received the samples (8/26/14).

The samples were received at 0°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

Method Blank

The Method Blank EQ1400557-01 contained low levels of various congeners above the Method Reporting Limit (MRL). The associated samples have result which are 10 times higher than the blank.

MS/MSD

EQ1400557: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were not analyzed and reported.

E flags

Samples associated with service request K1408725 were reported with an ‘E’ flag to denote that they had concentration greater than the high calibration point. The process of dilution is counter to the isotopic dilution technique that the laboratory uses to determine recovery and produces variability in the final value. The laboratory has demonstrated linearity of the curve above the highest calibration point and only dilutes when concentrations are greater than the demonstrated level or when detector saturation occurs.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: Science and Engineering for the Environment, LLC **Service Request:**K140872
Project: RM11E Supplemental RI/FS Investigation

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
K140872 -001	PW001A T0	8/17/2014	1038
K140872 -002	PW001B T0	8/17/2014	1038
K140872 -003	PW002A T0	8/17/2014	1108
K140872 -004	PW002B T0	8/17/2014	1108
K140872 -00	PW003A T0	8/17/2014	1133
K140872 -00	PW003B T0	8/17/2014	1133
K140872 -007	PW004A T0	8/17/2014	1202
K140872 -008	PW004B T0	8/17/2014	1202
K140872 -00	PW00 A T0	8/17/2014	122
K140872 -010	PW00 A T0	8/17/2014	122
K140872 -011	PW00 A	8/17/2014	1240
K140872 -012	PW00 B	8/17/2014	1240
K140872 -013	PW007A	8/17/2014	1302
K140872 -014	PW007B	8/17/2014	1302
K140872 -01	RM11E-PW00 B-T0	8/18/2014	1300
K140872 -01	RM11E-PW007B-T0	8/18/2014	1 30

Service Request Summary

Folder #: **K1408725**
Client Name: Science and Engineering for the Environment, LLC
Pro ect Name: RM11E Supplemental RI/FS Investigation
Pro ect Number:

Report To: Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810
SA
Phone Number: 20 -418- 173
Cell Number: 20 - 1 -410
Fa Number: 20 -418- 187
E-mail: tthompson seellc.com

Pro ect Chemist: eff Christian
Originating Lab: KELSO
Logged By: KSMITH
Date Received: 08/18/14 - 08/20/14
Internal Due Date: /1 /2014
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged :
Report to MDL :
P.O. Number:
EDD: Striplin GSI

1 8 o -Glass ar WM CLEAR Teflon Liner npreserved
Location: K-ATHENA-17, EHRMS-WIC 4A
Pressure Gas:

				KELSO	HO ST ON
Lab Samp No.	**Client Samp No**	**Matrix**	**Collected**	MISC PHC1/None	Cl Biphen Cong/1 8C
K140872 -001	PW001A T0	Soil	08/17/14 1038	**IV**	**IV**
K140872 -002	PW001B T0	Soil	08/17/14 1038	**IV**	**IV**
K140872 -003	PW002A T0	Soil	08/17/14 1108	**IV**	**IV**
K140872 -004	PW002B T0	Soil	08/17/14 1108	**IV**	**IV**
K140872 -00	PW003A T0	Soil	08/17/14 1133	**IV**	**IV**
K140872 -00	PW003B T0	Soil	08/17/14 1133	**IV**	**IV**
K140872 -007	PW004A T0	Soil	08/17/14 1202	**IV**	**IV**
K140872 -008	PW004B T0	Soil	08/17/14 1202	**IV**	**IV**
K140872 -00	PW00 A T0	Soil	08/17/14 122	**IV**	**IV**
K140872 -010	PW00 A T0	Soil	08/17/14 122	**IV**	**IV**
K140872 -011	PW00 A	Soil	08/17/14 1240	**IV**	**IV**
K140872 -012	PW00 B	Soil	08/17/14 1240	**IV**	**IV**
K140872 -013	PW007A	Soil	08/17/14 1302	**IV**	**IV**
K140872 -014	PW007B	Soil	08/17/14 1302	**IV**	**IV**
K140872 -01	RM11E-PW00 B-T0	Soil	08/18/14 1300	**IV**	**IV**

Printed /2 /2014 12:13: 8 PM

Service Request Summary

Folder #:	**K1408725**	Pro ect Chemist:	eff Christian
Client Name:	Science and Engineering for the Environment, LLC	Originating Lab:	KELSO
Pro ect Name:	RM11E Supplemental RI/FS Investigation	Logged By:	KSMITH
Pro ect Number:		Date Received:	08/18/14 - 08/20/14
		Internal Due Date:	/1 /2014
Report To:	Tim Thompson Science and Engineering for the Environment, LLC 4401 Latona Ave NE Seattle, WA 810 SA	AP:	LAB AP
		ualifier Set:	Lab Standard
		Formset:	Lab Standard
		Merged :	
Phone Number:	20 -418- 173	Report to MDL :	
Cell Number:	20 - 1 -410	P.O. Number:	
Fa Number:	20 -418- 187	EDD:	Striplin GSI
E-mail:	tthompson seellc.com		

1 8 o -Glass ar WM CLEAR Teflon Liner npreserved

Location: K-ATHENA-17, EHRMS-WIC 4A

Pressure Gas:

Service Request Summary

Folder #:	**K1408725**	Pro ect Chemist:	eff Christian
Client Name:	Science and Engineering for the Environment, LLC	Originating Lab:	KELSO
Pro ect Name:	RM11E Supplemental RI/FS Investigation	Logged By:	KSMITH
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1 8 o -Glass ar WM CLEAR Teflon Liner npreserved

Location: K-ATHENA-17, EHRMS-WIC 4A

Pressure Gas:

Service Request Summary

Folder #:	**K1408725**	Pro ect Chemist:	eff Christian
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Fa Number:	20 -418- 187	EDD:	Striplin GSI
E-mail:	tthompson seellc.com		

1 8 o -Glass ar WM CLEAR Teflon Liner npreserved

Location: K-ATHENA-17, EHRMS-WIC 4A

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Organic LC	MISC PHC1/None	1	(1) PRC loading for 8 stations w/2 PE Samplers per station 1 (2) 2 hi-level and 2 low-level PE samplers for contingency 4 (3) 1 PE sampler for pre-pro ect trial 1.
Semivoa GCMS	Cl Biphen Cong/1 8C		uantity includes 8 stations 1 pre-pro ect trial .
Semivoa GCMS	Cl Biphen Cong/1 8C	7	(1) Analysis of PE for PRCs only. (2) uantity includes 7 stations. (3) 1 pre-pro ect trial billed with this SR.

Superset Summary

Service Request: K1408725 **SuperSet Reference:** 14-0000304446 rev 00

Analytical Method: **1668C**

Calibrations: 02/11/14

Data Files:

Raw Data	Begin CCAL	Method Blank	Lab ID
U237710	U237701	U237710	EQ1400557-01
U237727	U237718	U237710	K1408725-001
U237711	U237701	U237710	K1408725-003
U237728	U237718	U237710	K1408725-005
U237712	U237701	U237710	K1408725-007
U237713	U237701	U237710	K1408725-009
U237729	U237718	U237710	K1408725-011
U237730	U237718	U237710	K1408725-013

Data Qualifier Flags – PCB Congeners

- **B** Indicates the associated analyte is found in the method blank, as well as in the sample
- **E** Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range
- **J** Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the estimated detection limit (EDL)
- **K** EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- **U** Indicates the compound was analyzed and not detected
- **Y** Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- **ND** Indicates concentration is reported as 'Not Detected'
- **S** Peak is saturated; data not reportable
- **Q** Lock-mass interference by ether compounds
- **X** See case narrative

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01	11/30/2014
Arizona Department of Health Services	AZ0793	5/27/2015
Arkansas Department of Environmental Quality	14-038-0	6/16/2015
California Department of Health Services	2452	2/28/2015
Florida Department of Health	E87611	6/30/2015
Hawaii Department of Health	TX02694	6/30/2015
Illinois Environmental Protection Agency	200057	10/6/2014
Kansas Department of Health and Environment	E-10406	1/31/2015
Louisiana Department of Environmental Quality	03048	12/31/2014
Louisiana Department of Health and Hospitals	TX2694	6/30/2015
Maine Center for Disease Control and Prevention	2014019	12/31/2014
Maryland Department of the Environment	343	6/30/2015
Michigan Depratment of Environmental Quality	9971	6/30/2015
Minnesota Department of Health	TX02694	12/31/2014
Nebraska Department of Health and Human Services	NE-OS-25-13	6/30/2015
Nevada Department of Concervation and Natural Resources	TX014112013-2	7/31/2015
New Jersey Department of Environmental Protection	NLC140001	6/30/2015
New Mexico Environment Department	TX02694	6/30/2015
New York Department of Health	11707	4/1/2015
Oklahoma Department of Environmental Quality	2014-124	8/31/2015
Oregon Environmental Laboratory Accreditation Program	TX200002	3/24/2015
Pennsylvania Department of Environmental Protection	68-03441	6/30/2015
Tennessee Department of Environment and Concervation	04016	6/30/2015
Texas Commision on Environmental Quality	TX104704216-14-5	6/30/2015
United States Department of Agriculture	P330-14-00067	2/21/2017
Utah Department of Health Environmental Laboratory Certification	TX02694	7/31/2015
Washington Department of Health	c819	11/14/2014
West Virginia Department of Environmental Protection	347	6/30/2015

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID: K 1408725 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 9/24/14	Analyst: Cee	Samples: 1, 5, 11, 13

Second Level - Data Review – to be filled by person doing peer review

Date: 09/25/14	Analyst: [illegible]	Samples: 001, 005, 011, 013

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1408725 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 9/19/14	Analyst: [illegible]	Samples: 3, 7, 9

Second Level - Data Review – to be filled by person doing peer review

Date: 09/19/14	Analyst: [illegible]	Samples: 003, 007, 009

PEER REVIEW PAGE

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

K1408725 5
Science and Engineering for the Environment, LLC
RM11E Supplemental RI/FS Investigation

Project Name: RM11E Supplemental RI/FS Investigation
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Cl Biphen Cong 1668C
K1408725-001	PW001A T0	1	Soil	8/17/14	1038	8/18/14	HOUSTON	IV
K1408725-002	PW001B T0	0	Soil	8/17/14	1038	8/18/14	HOUSTON	IV (H)
K1408725-003	PW002A T0	1	Soil	8/17/14	1108	8/18/14	HOUSTON	IV
K1408725-004	PW002B T0	0	Soil	8/17/14	1108	8/18/14	HOUSTON	IV (H)
K1408725-005	PW003A T0	1	Soil	8/17/14	1133	8/18/14	HOUSTON	IV
K1408725-006	PW003B T0	0	Soil	8/17/14	1133	8/18/14	HOUSTON	IV (H)
K1408725-007	PW004A T0	1	Soil	8/17/14	1202	8/18/14	HOUSTON	IV
K1408725-008	PW004B T0	0	Soil	8/17/14	1202	8/18/14	HOUSTON	IV (H)
K1408725-009	PW005A T0	1	Soil	8/17/14	1226	8/18/14	HOUSTON	IV
K1408725-011	PW006A	1	Soil	8/17/14	1240	8/18/14	HOUSTON	IV
K1408725-012	PW006B	0	Soil	8/17/14	1240	8/18/14	HOUSTON	IV (H)

Special Instructions/Comments

Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

Note: Analysis for PRCs only. J. Christian / T. Thompson will provide info on which are "High" & which are "Low".

pH Checked _____

Turnaround Requirements

____ RUSH (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

____ STANDARD

Requested FAX Date: 9/16/14

Requested Report Date: ~~09/09/14~~

Report Requirements

X I. Results Only (As per normal report)

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

____ IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# K1408725

Bill to

Relinquished By: Kaula Smith 8/25/14 1150

Received By: 8/26/14

Airbill Number:

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

K1408725 5
Science and Engineering for the Environment, LLC
RM11E Supplemental RI/FS Investigation

ject Name: RM11E Supplemental RI/FS Investigation
ject Number:
ject Manager: Tim Thompson
mpany: Science and Engineering for the Environment, LLC

ab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Cl Biphen Cong 1668C
1408725-013	PW007A	1	Soil	8/17/14	1302	8/18/14	HOUSTON	IV
1408725-015	RM11E-PW005B-T0	~~0~~	Soil	8/18/14	1300	8/20/14	HOUSTON	IV (H)
1408725-016	RM11E-PW007B-T0	~~0~~	Soil	8/18/14	1630	8/20/14	HOUSTON	IV (H)

t Comments

Biphen Cong - 1668C	K1408725-001,3,5,7,9,11,13	(1) Analysis of PE for PRCs only. (2) Quantity includes 7 stations. (3) 1 pre-project trial billed with this SR.
Biphen Cong - 1668C	K1408725-002,4,6,8,12,15,16	-Quantity includes 8 stations + 1 pre-project trial = 9.

pecial Instructions/Comments
lease provide the electronic (PDF and EDD) report to the following e-mail address:
ALKLS.Data@alsglobal.com.

H Checked _____

Turnaround Requirements
____ **RUSH** (Surcharges Apply)
PLEASE CIRCLE WORK DAYS
1 2 3 4 5
____ **STANDARD**
Requested FAX Date: _____
Requested Report Date: 09/09/14

Report Requirements
____ I. Results Only
____ II. Results + QC Summaries
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
PQL/MDL/J Y
EDD Y

Invoice Information
PO# K1408725
Bill to

inquished By: Kayla Smith 8/25/14 1150 Received By: 8-26-14 Airbill Number: _____

ALS Environmental

Cooler Receipt Form

Project Chemist: AK

Client/Project: Tim Thompson Science and Engineering for the Environment

Thermometer ID: SMO

Date/Time Received: 8/26/14 902 Initials: DE

Date/Time Logged in: 8/26/14 1040 Initials: JCM

1. Method of delivery: ○ US Mail ☒ Fed Ex ○ UPS ○ DHL ○ Courier ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ☒ Yes ○ No
   Were they intact? ☒ Yes ○ No ○ N/A
   Were they signed and dated? ☒ Yes ○ No ○ N/A
   If yes, how many and where? 1 front seal
4. Packing Material: ○ Inserts ○ Baggies ☑ Bubble Wrap ☑ Gel Packs ○ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
5478 9736 4142		8/26/14	1015	JCM	1/1	☑
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

# of containers on COC:

# of containers received:

Service request Label:

K1408725 5

Science and Engineering for the Environment, LLC
RM11E Supplemental RI/FS Investigation

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 217928 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/DEDWARDS **Prep Method:** Method **Prep Date/Time:** 9/15/14 12:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1400557-01	MB		1668C/Cl Biphen Cong		Solid	0.619g	
2	K1408725-001	PW001A T0	.01	1668C/Cl Biphen Cong		Soil	0.764g	Clear plastic strip
3	K1408725-003	PW002A T0	.01	1668C/Cl Biphen Cong		Soil	0.606g	Clear plastic strip
4	K1408725-005	PW003A T0	.01	1668C/Cl Biphen Cong		Soil	0.729g	Clear plastic strip
5	K1408725-007	PW004A T0	.01	1668C/Cl Biphen Cong		Soil	0.699g	Clear plastic strip
6	K1408725-009	PW005A T0	.01	1668C/Cl Biphen Cong		Soil	0.606g	Clear plastic strip
7	K1408725-011	PW006A	.01	1668C/Cl Biphen Cong		Soil	0.634g	Clear plastic strip
8	K1408725-013	PW007A	.01	1668C/Cl Biphen Cong		Soil	0.639g	Clear plastic strip

Spiking Solutions

Name: 1668A Labeled Working Standard Inventory ID 74725 Logbook Ref: 2-4ng/mL 74725 TL 9/12/14 Expires On: 09/12/2015

EQ1400557-01	1,000.00µL	K1408725-001	1,000.00µL	K1408725-003	1,000.00µL	K1408725-005	1,000.00µL	K1408725-007	1,000.00µL	K1408725-009	1,000.00µL
K1408725-011	1,000.00µL	K1408725-013	1,000.00µL								

Preparation Materials

Hexanes 95%	LM 8/28/14 (74135)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	TL 8/12/14 (73534)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	LM 09/09/14 (74580)

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	9/15/14 12:00	Started:	9/22/14 15:00	Started:	9/22/14 15:00	Started:	9/18/14 17:00
Finished:	9/16/14 15:00	Finished:	9/22/14 15:00	Finished:	9/22/14 15:00	Finished:	9/18/14 18:00
By:	HLEUNG	By:	HLEUNG	By:	HLEUNG	By:	HLEUNG
Comments		Comments		Comments		Comments	

Comments: _____

Reviewed By: TL Date: 9/22/14

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 10:38
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW001A T0	**Units:**	ug/Kg
Lab Code:	K1408725-001	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 00:18
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.764g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237727	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	16100		0.614	0.614	1.01	0.860	1
PCBs 44 + 47 + 65	15100		0.206	0.206	0.75	1.249	1
PCB 54	13500	**E**	0.0197	0.0262	0.71	1.001	1
PCB 111	22600		0.0619	0.0654	1.55	0.949	1
PCBs 153 + 168	20000		0.0376	0.131	1.21	0.905	1
PCB 178	18500		0.0274	0.0654	1.00	1.080	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	17700		0.0710	0.262	1.56	0.909	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 10:38
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW001A T0	**Units:**	ug/Kg
Lab Code:	K1408725-001	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 00:18
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.764g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237727	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1479.507	74		5-145	1.05	1.083
PCB 19L	2000	1389.312	69		5-145	1.15	1.069
PCB 81L	2000	1235.523	62		10-145	0.83	1.335
PCB 77L	2000	1382.970	69		10-145	0.87	1.357
PCB 54L	2000	1735.736	87	K	5-145	0.93	0.831
PCB 104L	2000	1616.857	81		10-145	1.57	0.825
PCB 118L	2000	1398.434	70		10-145	1.56	1.148
PCB 105L	2000	1513.806	76		10-145	1.48	1.185
PCB 126L	2000	1284.983	64		10-145	1.48	1.277
PCB 114L	2000	1383.429	69		10-145	1.48	1.165
PCB 123L	2000	1385.725	69		10-145	1.50	1.138
PCB 155L	2000	1989.456	99		10-145	1.19	0.798
PCBs 156L + 157L	4000	3441.668	86		10-145	1.23	1.100
PCB 169L	2000	1774.734	89		10-145	1.16	1.179
PCB 167L	2000	1663.768	83		10-145	1.28	1.072
PCB 189L	2000	1473.540	74		10-145	1.00	0.960
PCB 188L	2000	1705.150	85		10-145	1.05	0.724

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 11:08
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW002A T0	**Units:**	ug/Kg
Lab Code:	K1408725-003	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 01:41
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.606g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237711	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	717		0.142	0.142	1.00	0.860	1
PCBs 44 + 47 + 65	660		0.0526	0.165	0.78	1.250	1
PCB 54	564	**E**	0.0294	0.0330	0.69	1.001	1
PCB 111	1190		0.0672	0.0825	1.55	0.948	1
PCBs 153 + 168	1210		0.0199	0.165	1.21	0.904	1
PCB 178	1210		0.0307	0.0825	1.01	1.079	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	890		0.0816	0.330	1.54	0.908	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 11:08
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW002A T0	**Units:**	ug/Kg
Lab Code:	K1408725-003	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 01:41
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.606g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237711	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1396.137	70		5-145	0.97	1.083
PCB 19L	2000	1180.262	59		5-145	1.13	1.069
PCB 81L	2000	1431.301	72		10-145	0.83	1.334
PCB 77L	2000	1372.792	69		10-145	0.78	1.356
PCB 54L	2000	1556.971	78		5-145	0.77	0.831
PCB 104L	2000	1533.185	77		10-145	1.47	0.825
PCB 118L	2000	1498.943	75		10-145	1.62	1.148
PCB 105L	2000	1608.305	80		10-145	1.61	1.185
PCB 126L	2000	1322.635	66		10-145	1.57	1.276
PCB 114L	2000	1545.872	77		10-145	1.58	1.163
PCB 123L	2000	1448.699	72		10-145	1.56	1.138
PCB 155L	2000	1999.068	100		10-145	1.22	0.799
PCBs 156L + 157L	4000	3595.817	90		10-145	1.31	1.100
PCB 169L	2000	1861.676	93		10-145	1.34	1.179
PCB 167L	2000	1864.950	93		10-145	1.20	1.072
PCB 189L	2000	1590.455	80		10-145	1.00	0.960
PCB 188L	2000	1759.060	88		10-145	1.01	0.724

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 11:33
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW003A T0	**Units:**	ug/Kg
Lab Code:	K1408725-005	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 01:22
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.729g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237728	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	17800		1.47	1.47	1.01	0.860	1
PCBs 44 + 47 + 65	15800		0.198	0.198	0.76	1.249	1
PCB 54	14800	**E**	0.0343	0.0343	0.72	1.001	1
PCB 111	28900		0.0731	0.0731	1.55	0.949	1
PCBs 153 + 168	29500		0.0440	0.137	1.22	0.905	1
PCB 178	30000		0.0360	0.0686	0.98	1.080	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	20600		0.0838	0.274	1.55	0.909	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 11:33
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW003A T0	**Units:**	ug/Kg
Lab Code:	K1408725-005	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 01:22
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.729g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237728	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1384.756	69		5-145	1.06	1.083
PCB 19L	2000	1199.229	60		5-145	1.00	1.069
PCB 81L	2000	1252.441	63		10-145	0.84	1.335
PCB 77L	2000	1312.888	66		10-145	0.76	1.357
PCB 54L	2000	1588.196	79	K	5-145	1.04	0.831
PCB 104L	2000	1487.220	74		10-145	1.43	0.825
PCB 118L	2000	1354.135	68		10-145	1.65	1.148
PCB 105L	2000	1324.632	66		10-145	1.64	1.185
PCB 126L	2000	1232.570	62		10-145	1.51	1.277
PCB 114L	2000	1298.884	65		10-145	1.54	1.165
PCB 123L	2000	1302.197	65		10-145	1.54	1.139
PCB 155L	2000	1923.697	96		10-145	1.18	0.798
PCBs 156L + 157L	4000	3198.978	80		10-145	1.25	1.100
PCB 169L	2000	1651.736	83		10-145	1.19	1.179
PCB 167L	2000	1594.891	80		10-145	1.24	1.072
PCB 189L	2000	1413.142	71		10-145	1.09	0.960
PCB 188L	2000	1577.172	79		10-145	0.98	0.724

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:02
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW004A T0	**Units:**	ug/Kg
Lab Code:	K1408725-007	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 02:46
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.699g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237712	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	613		0.110	0.110	1.00	0.860	1
PCBs 44 + 47 + 65	557		0.0382	0.143	0.77	1.251	1
PCB 54	548	**E**	0.0254	0.0286	0.70	1.001	1
PCB 111	810		0.0515	0.0715	1.53	0.948	1
PCBs 153 + 168	776		0.0269	0.143	1.23	0.904	1
PCB 178	732		0.0242	0.0715	0.97	1.079	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	690		0.0626	0.286	1.58	0.908	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:02
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW004A T0	**Units:**	ug/Kg
Lab Code:	K1408725-007	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 02:46
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.699g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237712	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1361.113	68		5-145	0.96	1.083
PCB 19L	2000	1363.770	68		5-145	1.09	1.069
PCB 81L	2000	1387.388	69		10-145	0.80	1.334
PCB 77L	2000	1456.759	73		10-145	0.78	1.356
PCB 54L	2000	1603.606	80		5-145	0.80	0.831
PCB 104L	2000	1525.338	76		10-145	1.49	0.824
PCB 118L	2000	1489.099	74		10-145	1.62	1.147
PCB 105L	2000	1547.484	77		10-145	1.66	1.185
PCB 126L	2000	1359.564	68		10-145	1.59	1.275
PCB 114L	2000	1507.625	75		10-145	1.58	1.163
PCB 123L	2000	1488.518	74		10-145	1.63	1.138
PCB 155L	2000	1878.352	94		10-145	1.15	0.798
PCBs 156L + 157L	4000	3595.650	90		10-145	1.29	1.101
PCB 169L	2000	1798.096	90		10-145	1.24	1.179
PCB 167L	2000	1897.635	95		10-145	1.20	1.071
PCB 189L	2000	1459.026	73		10-145	0.93	0.960
PCB 188L	2000	1756.383	88		10-145	1.02	0.725

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:26
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW005A T0	**Units:**	ug/Kg
Lab Code:	K1408725-009	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 03:51
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.606g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237713	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	669		0.127	0.127	1.02	0.860	1
PCBs 44 + 47 + 65	607		0.0320	0.165	0.78	1.251	1
PCB 54	515	**E**	0.0210	0.0330	0.70	1.001	1
PCB 111	1060		0.0535	0.0825	1.53	0.948	1
PCBs 153 + 168	1030		0.0256	0.165	1.19	0.905	1
PCB 178	966		0.0268	0.0825	0.97	1.079	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	834		0.0649	0.330	1.57	0.908	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:26
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW005A T0	**Units:**	ug/Kg
Lab Code:	K1408725-009	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 03:51
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.606g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237713	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1620.328	81		5-145	0.98	1.083
PCB 19L	2000	1158.923	58		5-145	1.15	1.069
PCB 81L	2000	1471.617	74		10-145	0.81	1.334
PCB 77L	2000	1510.004	76		10-145	0.82	1.356
PCB 54L	2000	1685.315	84		5-145	0.82	0.831
PCB 104L	2000	1439.294	72		10-145	1.41	0.824
PCB 118L	2000	1459.851	73		10-145	1.62	1.147
PCB 105L	2000	1523.700	76		10-145	1.59	1.184
PCB 126L	2000	1400.931	70		10-145	1.56	1.276
PCB 114L	2000	1458.598	73		10-145	1.59	1.163
PCB 123L	2000	1466.753	73		10-145	1.51	1.138
PCB 155L	2000	1794.833	90		10-145	1.09	0.798
PCBs 156L + 157L	4000	3525.408	88		10-145	1.31	1.101
PCB 169L	2000	1776.063	89		10-145	1.21	1.179
PCB 167L	2000	1772.336	89		10-145	1.29	1.071
PCB 189L	2000	1487.398	74		10-145	0.99	0.960
PCB 188L	2000	1592.027	80		10-145	1.05	0.725

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:40
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW006A	**Units:**	ug/Kg
Lab Code:	K1408725-011	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 02:27
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.634g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237729	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	17700		0.601	0.601	1.01	0.860	1
PCBs 44 + 47 + 65	16200		0.224	0.224	0.76	1.250	1
PCB 54	15300	**E**	0.0436	0.0436	0.72	1.001	1
PCB 111	30200		0.0787	0.0789	1.54	0.949	1
PCBs 153 + 168	31800		0.0778	0.158	1.23	0.905	1
PCB 178	32000		0.0892	0.0892	0.99	1.080	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	20600		0.0903	0.315	1.55	0.909	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:40
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW006A	**Units:**	ug/Kg
Lab Code:	K1408725-011	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 02:27
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.634g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237729	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1387.456	69		5-145	0.93	1.083
PCB 19L	2000	1373.637	69	K	5-145	1.22	1.069
PCB 81L	2000	1280.467	64		10-145	0.74	1.335
PCB 77L	2000	1326.136	66		10-145	0.78	1.357
PCB 54L	2000	1603.711	80	K	5-145	0.91	0.831
PCB 104L	2000	1628.959	81		10-145	1.48	0.825
PCB 118L	2000	1381.964	69		10-145	1.55	1.148
PCB 105L	2000	1421.616	71		10-145	1.58	1.185
PCB 126L	2000	1258.802	63		10-145	1.58	1.277
PCB 114L	2000	1336.811	67		10-145	1.49	1.165
PCB 123L	2000	1372.622	69		10-145	1.58	1.139
PCB 155L	2000	1949.757	97		10-145	1.16	0.798
PCBs 156L + 157L	4000	3049.378	76		10-145	1.23	1.100
PCB 169L	2000	1591.449	80		10-145	1.24	1.179
PCB 167L	2000	1552.875	78		10-145	1.29	1.071
PCB 189L	2000	1493.941	75		10-145	1.05	0.960
PCB 188L	2000	1644.205	82		10-145	1.03	0.724

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 13:02
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW007A	**Units:**	ug/Kg
Lab Code:	K1408725-013	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 03:32
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.639g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237730	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	618		0.132	0.132	1.00	0.860	1
PCBs 44 + 47 + 65	556		0.0891	0.156	0.76	1.250	1
PCB 54	522	**E**	0.0445	0.0445	0.73	1.001	1
PCB 111	987		0.127	0.127	1.53	0.948	1
PCBs 153 + 168	1020		0.0904	0.156	1.23	0.905	1
PCB 178	966		0.0715	0.0782	0.99	1.080	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	729		0.146	0.313	1.54	0.908	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 13:02
Sample Matrix:	Soil	**Date Received:**	08/18/14 08:00
Sample Name:	PW007A	**Units:**	ug/Kg
Lab Code:	K1408725-013	**Basis:**	Adjustment Factor

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/20/14 03:32
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.639g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237730	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237718

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1457.908	73		5-145	1.03	1.083
PCB 19L	2000	1231.517	62		5-145	1.00	1.070
PCB 81L	2000	1320.850	66		10-145	0.81	1.335
PCB 77L	2000	1346.668	67		10-145	0.77	1.356
PCB 54L	2000	1581.694	79		5-145	0.81	0.831
PCB 104L	2000	1546.089	77		10-145	1.54	0.825
PCB 118L	2000	1323.940	66		10-145	1.47	1.148
PCB 105L	2000	1402.749	70		10-145	1.61	1.185
PCB 126L	2000	1310.622	66		10-145	1.58	1.277
PCB 114L	2000	1424.261	71		10-145	1.59	1.165
PCB 123L	2000	1380.690	69		10-145	1.56	1.139
PCB 155L	2000	2098.809	105		10-145	1.17	0.797
PCBs 156L + 157L	4000	3308.752	83		10-145	1.27	1.102
PCB 169L	2000	1685.532	84		10-145	1.27	1.179
PCB 167L	2000	1678.844	84		10-145	1.34	1.072
PCB 189L	2000	1471.041	74		10-145	1.06	0.960
PCB 188L	2000	1768.794	88		10-145	1.06	0.724

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	EQ1400557-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 00:37
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.619g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237710	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	0.230	**K**	0.0822	0.0822	0.84	0.860	1
PCBs 44 + 47 + 65	0.291		0.0374	0.162	0.82	1.251	1
PCB 54	0.195		0.0252	0.0323	0.79	1.001	1
PCB 111	0.316	**K**	0.0466	0.0808	1.28	0.948	1
PCBs 153 + 168	0.212	**K**	0.0291	0.162	0.74	0.905	1
PCB 178	0.165	**K**	0.0373	0.0808	1.42	1.078	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	0.272	**J**	0.0566	0.323	1.48	0.909	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1408725
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	EQ1400557-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	09/19/14 00:37
Prep Method:	Method	**Date Extracted:**	9/15/14
Sample Amount:	0.619g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U237710	**Blank File Name:**	U237710
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U237701

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1360.459	68		5-145	1.03	1.083
PCB 19L	2000	1077.465	54		5-145	0.99	1.068
PCB 81L	2000	1146.855	57		10-145	0.78	1.334
PCB 77L	2000	1158.918	58		10-145	0.80	1.356
PCB 54L	2000	1279.820	64		5-145	0.79	0.830
PCB 104L	2000	1280.639	64		10-145	1.48	0.824
PCB 118L	2000	1322.142	66		10-145	1.57	1.148
PCB 105L	2000	1344.676	67		10-145	1.60	1.184
PCB 126L	2000	1225.809	61		10-145	1.57	1.276
PCB 114L	2000	1289.277	64		10-145	1.59	1.163
PCB 123L	2000	1316.399	66		10-145	1.56	1.138
PCB 155L	2000	1529.081	76		10-145	1.13	0.799
PCBs 156L + 157L	4000	2945.311	74		10-145	1.25	1.101
PCB 169L	2000	1371.077	69		10-145	1.25	1.178
PCB 167L	2000	1506.034	75		10-145	1.34	1.071
PCB 189L	2000	1312.063	66		10-145	1.00	0.960
PCB 188L	2000	1457.993	73		10-145	1.02	0.725

Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental
ALS Group USA, Corp.
1317 South 13th Avenue
Kelso, WA 98626
T: +1 360 577 7222
F: +1 360 636 1068
www.alsglobal.com

April 9, 2015

Analytical Report for Service Request No: K1411748
Revised Service Request No: K1411748.02

Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 98105

RE: RM 11E

Dear Tim:

Enclosed is the revised report for the samples submitted to our laboratory on October 22, 2014. For your reference, these analyses have been assigned our service request number K1411748.

This report includes revisions for the Total Homolog values for samples RM11E-PWW003A, RM11E-PWP003A, RM11E-PWW001B, RM11E-PWP001B, RM11E-PWW002A, RM11E-PWP002A, RM11E-PWW004B, and RM11E-PWP004B.

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.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) 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.

We apologize for any inconvenience this may have created.

Please call if you have any questions. My extension is 3316. You may also contact me via Email at Jeff.Christian@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Jeff Christian
Director of Operations - Western U.S.A.

REVISED
10:40 am, Apr 09, 2015

REVISED
2:52 pm, Mar 02, 2015

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science & Engineering for the Environment, LLC	**Service Request No.:**	K1411748
Project:	RM 11E	**Date Received:**	10/22/14
Sample Matrix:	PE		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV.

Sample Receipt

Twenty-eight PE samples were received for analysis at ALS Environmental on 10/22/14. Fifteen samples were authorized for analysis of PCB Congeners by EPA Method 1668C. The remaining samples were either shipped to MIT or archived as per the attached chain of custody. The samples for archive are being stored at the ALS/Houston (TX) laboratory.

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.

PCB Congeners by EPA Method 1668C

As noted, the samples were shipped to ALS/Houston (TX) for the analysis of PCB Congeners. The results are appended to this report and intended as a stand alone document.

Approved by: _____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 x 07 • FAX (360) 636-1068

DATE 10/21/2014 PAGE 1 OF

PROJECT NAME RMIIE #

PROJECT MANAGER Tim Thompson

COMPANY NAME SEE, LLC

ADDRESS 4401 Latona Ave NE Seattle, WA

PHONE 2010 418 6173

SAMPLERS SIGNATURE

ANALYSIS REQUESTED K1411748

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB Congeners	Archive	REMARKS
RMIIE-PWW007	10/20/14			PE	2	X	X	Authorized by T. Thompson 10/22/14 10/22/14 Hold for confirmation
RMIIE-PWP007	10/20/14			PE	1		X	
RMIIE-PWW006A	10/20/14			PE	2	X	X	
RMIIE-PWP006A	10/20/14			PE	2	X	X	
RMIIE-PWW006B	10/20/14			PE	1		X	
RMIIE-PWP006B	10/20/14			PE	1		X	
RMIIE-PWW005B	10/20/14	1508		PE	1		X	
RMIIE-PWP005B	10/20/14	1508		PE	1		X	
RMIIE-PWW005A	10/20/14	1508		PE	2	X	X	
RMIIE-PWP005A	10/20/14	1508		PE	2	X	X	

REPORT REQUIREMENTS

- ✓ I. Routine Report: Method Blank, Surrogate, as required
- ✓ II. Report Dup., MS, MSD as required
- III. CLP Like Summary (no raw data)
- IV. Data Validation Report
- ✓ V. EDD

INVOICE INFORMATION

P.O. #

Bill To: SEE, LLC 4401 Latona Ave NE Seattle, WA 98105

TURNAROUND REQUIREMENTS

- 24 hr. 48 hr. 5 day
- X Standard (10-15 working days)
- Provide Verbal Preliminary Results
- Provide FAX preliminary 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 Tl 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 Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

- Sample Names are very similar w/ same time/date.
- Please look closely at sample name when assigning lab ID & analyzing.

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Tim Thompson	Signature: Kaila Smith	Signature	Signature: Kaila Smith
Date/Time: 10/21/2014	Date/Time: 10/21/14 1702	Date/Time	Date/Time: 10/22/14 0800
Printed Name: Tim Thompson	Printed Name: Kaila Smith	Printed Name	Printed Name: Kaila Smith
Firm: SEE	Firm: ALS	Firm	Firm: ALS

DISTRIBUTION: WHITE - return to originator: YELLOW - lab: PINK - retained by originator

COC blank 2-2013

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 x 07 • FAX (360) 636-1068

DATE 10/21/2014 PAGE 2 OF

PROJECT NAME RM11E #

PROJECT MANAGER Tim Thompson

COMPANY NAME SEE, LLC

ADDRESS 4401 Latona Ave NE Seattle, WA 98105

PHONE 206 418 6173

SAMPLERS SIGNATURE

K1411748

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB congeners	Archive	MIT (PCBs)	REMARKS
RM11E-PWW504	10/20/14	1305		PE	1	X			
RM11E-PWP504	10/20/14	1305		PE	1	X			
RM11E-PWW004B	10/20/14	1305		PE	1		X		
RM11E-PWP004B	10/20/14	1305		PE	1		X		
RM11E-PWP004A	10/20/14	1305		PE	2	X		X	
RM11E-PWW004A	10/20/14	1305		PE	2	X		X	
RM11E-PWW003A	10/20/14			PE	2	X	X		
RM11E-PWP003A	10/20/14			PE	2	X	X		
RM11E-PWW003B	10/20/14			PE	1		X		
RM11E-PWP003B	10/20/14			PE	1		X		

REPORT REQUIREMENTS

- ✓ I. Routine Report: Method Blank, Surrogate, as required
- ✓ II. Report Dup., MS, MSD as required
- III. CLP Like Summary (no raw data)
- IV. Data Validation Report
- ✓ V. EDD

INVOICE INFORMATION

P.O. #

Bill To: SEE, LLC
4401 Latona NE
Seattle, WA 98105

TURNAROUND REQUIREMENTS

- 24 hr. 48 hr. 5 day
- ✓ Standard (10-15 working days)
- Provide Verbal Preliminary Results
- Provide FAX preliminary 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 Tl 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 Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
*Sample ID's are very similar w/ same date time, Pay close attention to sample ID's

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature]	Signature: Karla Smith	Signature	Signature: Karla Smith
Date/Time: 10/21/14	Date/Time: 10/21/14 1702	Date/Time	Date/Time: 10/22/14 0802
Printed Name: [illegible]	Printed Name: Karla Smith	Printed Name	Printed Name: Karla Smith
Firm: SEE	Firm: ALS	Firm	Firm: ALS

DISTRIBUTION: WHITE - return to originator: YELLOW - lab: PINK - retained by originator

COC blank 2-2013

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 x 07 • FAX (360) 636-1068 DATE _____ PAGE 3 OF _____

PROJECT NAME RM11E #
PROJECT MANAGER Tim Thompson
COMPANY NAME SEE, LLC
ADDRESS 4401 Latona Ave NE
Seattle, WA 98105
PHONE 206 619-4109
SAMPLERS SIGNATURE

ANALYSIS REQUESTED 1411748

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB congeners	Archive	MIT (PCBs)	REMARKS
RM11E-PWW002B	10/20/14	10:18		PE	1		X		
RM11E-PWP002B	10/20/14	10:18		PE	1		X		
RM11E-PWW002A	10/20/14	10:18		PE	2	X	X		
RM11E-PWP002A	10/20/14	10:18		PE	2	X	X		
RM11E-PWW001B	10/20/14	11:35		PE	2		X		
RM11E-PWP001B	10/20/14	11:35		PE	2		X		
RM11E-PWW001A	10/20/14	11:35		PE	2	X		X	
RM11E-PWP001A	10/20/14	11:35		PE	2	X		X	

REPORT REQUIREMENTS

- ✓ I. Routine Report: Method Blank, Surrogate, as required
- ✓ II. Report Dup., MS, MSD as required
- III. CLP Like Summary (no raw data)
- IV. Data Validation Report
- ✓ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: SEE (as above)

TURNAROUND REQUIREMENTS

- 24 hr. 48 hr. 5 day
- ✓ Standard (10-15 working days)
- Provide Verbal Preliminary Results
- Provide FAX preliminary 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 Tl 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 Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
- Sample names are very similar, please note ID's closely as time/date stamp is identical.

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date/Time: 10/21/14	Signature: Paula Smith Date/Time: 10/21/14 1702	Signature: Date/Time:	Signature: Paula Smith Date/Time: 10/22/14 0800
Printed Name: Tim Thompson Firm: SEE	Printed Name: Paula Smith Firm: ALS	Printed Name: Firm:	Printed Name: Paula Smith Firm: ALS

DISTRIBUTION: WHITE - return with report; [illegible] YELLOW - lab; PINK - retained by originator

COC blank 2 2013

PC Christian

Cooler Receipt and Preservation Form

Client / Project: SRC Service Request *K14* 11748

Received: 10/22/14 Opened: 10/22/14 By: KD Unloaded: 10/22/14 By: KD

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *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

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
nm	—	—	—	—	—			

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* N/A
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Page ____ *of* ____

April 7, 2015 Service Request No: K1411748

Jeff Christian
ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Results for: Science and Engineering for the Environment, LLC.
Dear Jeff,

Enclosed is the amended report for samples submitted to our laboratory on October 23, 2014. For your reference, these analyses have been assigned our service request number **K1411748.**

Amended report version 4, truncated the values the total homologs for which miss represented the total values for K1411748-017, 018, 025 and 026. An updated version of the assembly program, Labcoat, was released and corrected the truncation issue.

Please replace your original copy of the report with the report enclosed.

Please contact me if you have any questions. My direct number is 281-575-2279.

Respectfully submitted,

Arthi Kodur
Project Manager

ALS Environmental

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

REVISED
10:42 am, Apr 09, 2015

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

November 19, 2014 Service Request No: K1411748

Jeff Christian.

ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Result for: Science and Engineering for the Environment, LLC.
Dear Jeff:

Enclosed are the results of the sample(s) submitted to our laboratory on October 23, 2014. For Your reference, these analyses have been assigned our service request number: **K1411748.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct line is 281-575-2279. You may also contact me via email at Arthi.Kodur@alsglobal.com

Respectfully submitted,

ALS Group USA Corp., dba ALS Environmental

Arthi Kodur
Project Manager

Page 1 of 2440

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment, LLC	**Service Request No.:**	K1411748
Project:	RM 11E	**Date Received:**	10/23/14
Sample Matrix:	PE		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Twenty-eight PE samples were received for analysis at ALS Environmental on 10/23/14. Fifteen samples were authorized for analysis by 1668C. The remaining samples were archived per the client or sent to MIT for split sample analysis.

Please note the reporting forms are currently referencing the date ALS Environmental-Kelso received the samples (10/22/14) and not the date ALS Environmental-Houston received the samples (10/23/14).

The samples were received at 1°C 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.

Extraction/Re-extraction

The extraction technique performed on these samples followed the procedure outlined in the Guidance Document *Passive PE Sampling in Support of In Situ Remediation of Contaminated Sediments (Standard Operating Procedure for the Extraction and Analysis of Polyethylene Used In Polyethylene Devices)*, ESTCP Project ER-200915. December 2012.

Each sample was submerged in methylene chloride, and spiked with isotopically labelled standards. The samples were allowed to stand in methylene chloride for a minimum of 12 hours. Each extract was quantitatively transferred to an 8-oz jar. Each sample strip was rinsed three more times with methylene chloride. Each rinsate was added to the initial extract. Prior to extract concentration, each extract was aliquoted to perform an effective dilution based on the expected concentration range of the pre-loaded PRC congeners. This aliquot is reflected in a factor adjustment of the sample amount used in the extract.

The amount of isotopically labelled standard added to each sample was adjusted to ensure that the spike amount in the final aliquot was 2000 pg, or 100 ng/mL. This spike amount is reflected in the Labeled Standard summaries in this report.

Each extract aliquot was also spiked with 2000 pg of the 1668 clean-up standard. While extract cleanup procedures were not required, this standard was added to demonstrate that the effective dilution factors were appropriately applied.

Details regarding the re-extraction of archived sample portions can be found in the table below.

The dilution approach used by the laboratory is outlined in the attached flowchart.

Data Validation Notes and Discussion

General Comments

All polyethylene (PE) samples were originally analyzed in November of 2014. Due to issues associated with cross-contamination during extraction, carry-over for the instrumental analysis, and labeled spikes too low to allow significant dilution to bring high concentrations into a reasonable range, all samples were re-extracted and re-analyzed, except sample PWW007, as no sample mass remained. To address the various issues that arose during the initial analysis, a customized analytical scheme was put in place primarily to address the elevated levels of PCB congeners associated with the "high load" PE samples.

The re-analysis of samples from two locations required using "B" samples, which represented a second passive sampler from the same location. The initial analysis combined with split sampling to an outside laboratory consumed the entire mass for the "A" samples. The following samples were affected:

- PWW001B
- PWP001B
- PWW004B
- PWP004B

Note that the associated T_0 samples for the "B" PEs was reported under K1501568.

Also note that samples PWW504 and PWP504 (field duplicates) were analyzed and reported under K1501568.

B flags – Method Blanks

The Method Blank EQ1400690-01 was associated with sample PWW007 from the original analysis conducted in November of 2014. This blank contained low levels of several congeners below the Method Reporting Limit (MRL). The Method Blank EQ1400690-01 also contained several congeners reported above the reported MRL. This contamination was attributed to high values in the associated samples. The associated compounds in the samples were flagged with a 'B' flag where an associated result was detected, but less than 10 times the method blank value. The sample results for these compounds up to a level comparable to the method blank result should be considered biased high. Samples reported with this blank were consumed in the initial extraction and could not be re-extracted.

The Method Blank EQ1500022-01 contained low levels of several congeners below the Method Reporting Limit (MRL). The Method Blank EQ1500023-01 contained low levels of several congeners below the Method Reporting Limit (MRL).

MS/MSD

EQ1400690: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. PCB 4, 19, and 54 for EQ1400690-02 (LCS) and EQ1400690-03 (DLCS) were above the control limits. This was due to high concentration from samples associated with the original analysis of K1411748 and are included in this report because they are associated with PWW007.

EQ1500022 Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The batch quality control criteria were met.

EQ1500023 Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The batch quality control criteria were met.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

Where the EDL exceeds the MRL, the MRL is raised to equal the EDL.

Manual Integrations

For this type of instrumentation and software, manual integration may be required frequently to correct inaccurate integrations performed by the processing software. These manual integrations are indicated in the raw data with a before and after chromatogram and are stamped with the reason for integration.

The TEQ Summary results for each sample have been calculated by ALS ENVIRONMENTAL/Houston to include:

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

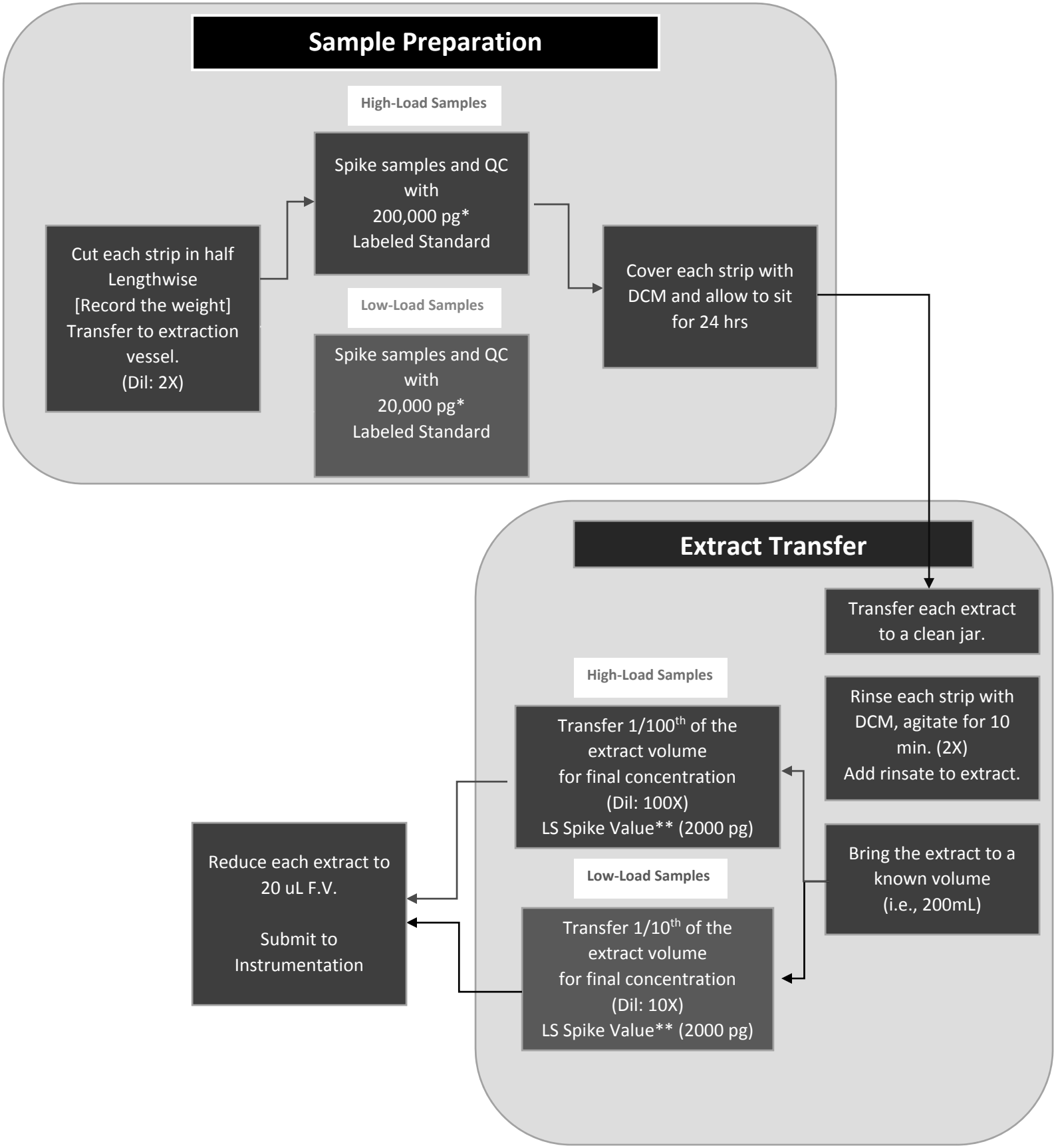
Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Samples Used in the original extraction	Samples used in re-extraction	RE-Extraction Batch	Actual Sample Amount (g)	Labeled Standard Added (pg)	Effective Dilution Factor	Factored Sample Amount (g)	Factored Labeled Standard Added (pg)	Cleanup Standard Added (pg)
K1411748-001 (RM11E-PWW007)	*	--						
K1411748-003 (RM11E-PWW006A)	K1411748-003 (RM11E-PWW006A)	EQ1500023	0.091	200000	100X	0.00091	2000	2000
K1411748-004 (RM11E-PWP006A)	K1411748-004 (RM11E-PWP006A)	EQ1500023	0.204	200000	100X	0.00204	2000	2000
K1411748-009 (RM11E-PWW005A)	K1411748-009 (RM11E-PWW005A)	EQ1500022	0.101	20000	10X	0.0101	2000	2000
K1411748-010 (RM11E-PWP005A)	K1411748-010 (RM11E-PWP005A)	EQ1500022	0.201	20000	10X	0.0201	2000	2000
K1411748-011 (RM11E-PWW504)	*	--						
K1411748-012 (RM11E-PWP504)	*	--						
K1411748-015 (RM11E-PWP004A)	**K1411748-014 (RM11E-PWP004B)	EQ1500022	0.163	20000	10X	0.0163	2000	2000
K1411748-016 (RM11E-PWW004A)	**K1411748-013 (RM11E- PWW004B)	EQ1500022	0.103	20000	10X	0.0103	2000	2000
K1411748-017 (RM11E-PWW003A)	K1411748-017 (RM11E-PWW003A)	EQ1500023	0.115	200000	100X	0.00115	2000	2000
K1411748-018 (RM11E-PWP003A)	K1411748-018 (RM11E-PWP003A)	EQ1500023	0.194	200000	100X	0.00194	2000	2000
K1411748-023 (RM11E-PWW002A)	K1411748-023 (RM11E-PWW002A)	EQ1500022	0.084	20000	10X	0.0084	2000	2000
K1411748-024 (RM11E-PWP002A)	K1411748-024 (RM11E-PWP002A)	EQ1500022	0.163	20000	10X	0.0163	2000	2000
K1411748-027 (RM11E-PWW001A)	**K1411748-025 (RM11E-PWW001B)	EQ1500023	0.088	200000	100X	0.00088	2000	2000
K1411748-028 (RM11E-PWP001A)	**K1411748-026 (RM11E-PWP001B)	EQ1500023	0.196	200000	100X	0.00196	2000	2000

*sample consumed in initial extraction

** duplicate archived sample

Batch	Dilution performed prior to sample clean-up
EQ1500022 (low-load PE samples)	1/10th of 200 mL (or 20 mL)
EQ1500023 (high-load PE samples)	1/100th of 200 mL (or 2 mL)



*Labeled standard concentration is presented in mass of each C13 Labeled Congener added to sample.

** LS Spike Value is presented in mass of each C13 Labeled congener present in final extract.

High-Load Sample Dilution: 200X
Low-Load Sample Dilution 20X

Client: Science and Engineering for the Environment, LLC **Service Request:**K1411748
Project: RM 11E

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
K1411748-001	RM11E-PWW007	10/20/2014	
K1411748-002	RM11E-PWP007	10/20/2014	
K1411748-003	RM11E-PWW00 A	10/20/2014	
K1411748-004	RM11E-PWP00 A	10/20/2014	
K1411748-00	RM11E-PWW00 B	10/20/2014	
K1411748-00	RM11E-PWP00 B	10/20/2014	
K1411748-007	RM11E-PWW00 B	10/20/2014	1 08
K1411748-008	RM11E-PWP00 B	10/20/2014	1 08
K1411748-00	RM11E-PWW00 A	10/20/2014	1 08
K1411748-010	RM11E-PWP00 A	10/20/2014	1 08
K1411748-011	RM11E-PWW 04	10/20/2014	130
K1411748-012	RM11E-PWP 04	10/20/2014	130
K1411748-013	RM11E-PWW004B	10/20/2014	130
K1411748-014	RM11E-PWP004B	10/20/2014	130
K1411748-01	RM11E-PWP004A	10/20/2014	130
K1411748-01	RM11E-PWW004A	10/20/2014	130
K1411748-017	RM11E-PWW003A	10/20/2014	
K1411748-018	RM11E-PWP003A	10/20/2014	
K1411748-01	RM11E-PWW003B	10/20/2014	
K1411748-020	RM11E-PWP003B	10/20/2014	
K1411748-021	RM11E-PWW002B	10/20/2014	1018
K1411748-022	RM11E-PWP002B	10/20/2014	1018
K1411748-023	RM11E-PWW002A	10/20/2014	1018
K1411748-024	RM11E-PWP002A	10/20/2014	1018
K1411748-02	RM11E-PWW001B	10/20/2014	113
K1411748-02	RM11E-PWP001B	10/20/2014	113
K1411748-027	RM11E-PWW001A	10/20/2014	113
K1411748-028	RM11E-PWP001A	10/20/2014	113

Service Request Summary

Folder #: **K1411748**
Client Name: Science and Engineering for the Environment, LLC
Pro ect Name: RM 11E
Pro ect Number:

Report To: Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810
SA
Phone Number: 20 -418- 173
Cell Number: 20 - 1 -410
Fa Number: 20 -418- 187
E-mail: tthompson seellc.com

Pro ect Chemist: eff Christian
Originating Lab: KELSO
Logged By: KSMITH
Date Received: 10/22/14
Internal Due Date: 11/13/2014
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged : N,
Report to MDL : N,
P.O. Number:
EDD: Striplin GSI

42 4 o -Glass ar WM CLEAR Teflon Liner npreserved
4 -N/A N/A
Location: EHRMS-WIC E, E-Disposed, K-Custody Relin, SMO
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	Cl Biphen Cong/1 8C HO ST ON
K1411748-001	RM11E-PWW007	PE	10/20/14	**IV**
K1411748-003	RM11E-PWW00 A	PE	10/20/14	**IV**
K1411748-004	RM11E-PWP00 A	PE	10/20/14	**IV**
K1411748-00	RM11E-PWW00 A	PE	10/20/14 1 08	**IV**
K1411748-010	RM11E-PWP00 A	PE	10/20/14 1 08	**IV**
K1411748-011	RM11E-PWW 04	PE	10/20/14 130	**IV**
K1411748-012	RM11E-PWP 04	PE	10/20/14 130	**IV**
K1411748-013	RM11E-PWW004B	PE	10/20/14 130	**IV**
K1411748-014	RM11E-PWP004B	PE	10/20/14 130	**IV**
K1411748-01	RM11E-PWP004A	PE	10/20/14 130	**IV**
K1411748-01	RM11E-PWW004A	PE	10/20/14 130	**IV**
K1411748-017	RM11E-PWW003A	PE	10/20/14	**IV**
K1411748-018	RM11E-PWP003A	PE	10/20/14	**IV**
K1411748-023	RM11E-PWW002A	PE	10/20/14 1018	**IV**
K1411748-024	RM11E-PWP002A	PE	10/20/14 1018	**IV**

Printed 2/3/201 3:02:14 PM

Service Request Summary

Folder #: **K1411748**
Client Name: Science and Engineering for the Environment, LLC
Pro ect Name: RM 11E
Pro ect Number:

Report To: Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810
SA
Phone Number: 20 -418- 173
Cell Number: 20 - 1 -410
Fa Number: 20 -418- 187
E-mail: tthompson seellc.com

Pro ect Chemist: eff Christian
Originating Lab: KELSO

Logged By: KSMITH
Date Received: 10/22/14
Internal Due Date: 11/13/2014
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged : N,

Report to MDL : N,
P.O. Number:
EDD: Striplin GSI

42 4 o -Glass ar WM CLEAR Teflon Liner npreserved
4 -N/A N/A

Location: EHRMS-WIC E, E-Disposed, K-Custody Relin, SMO

Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	HO ST ON Cl Biphen Cong/1 8C
K1411748-02	RM11E-PWW001B	PE	10/20/14 113	**IV**
K1411748-02	RM11E-PWP001B	PE	10/20/14 113	**IV**
K1411748-027	RM11E-PWW001A	PE	10/20/14 113	**IV**
K1411748-028	RM11E-PWP001A	PE	10/20/14 113	**IV**

Printed 2/3/201 3:02:14 PM

Service Request Summary

Folder #:	**K1411748**	Pro ect Chemist:	eff Christian
Client Name:	Science and Engineering for the Environment, LLC	Originating Lab:	KELSO
Pro ect Name:	RM 11E	Logged By:	KSMITH
Pro ect Number:		Date Received:	10/22/14
		Internal Due Date:	11/13/2014
Report To:	Tim Thompson Science and Engineering for the Environment, LLC 4401 Latona Ave NE Seattle, WA 810 SA	AP:	LAB AP
		ualifier Set:	Lab Standard
		Formset:	Lab Standard
		Merged :	N,
Phone Number:	20 -418- 173	Report to MDL :	N,
Cell Number:	20 - 1 -410	P.O. Number:	
Fa Number:	20 -418- 187	EDD:	Striplin GSI
E-mail:	tthompson seellc.com		

42 4 o -Glass ar WM CLEAR Teflon Liner npreserved
4 -N/A N/A

Location: EHRMS-WIC E, E-Disposed, K-Custody Relin, SMO

Pressure Gas:

Test Comments:

Group	Test/Method	Samples	Comments
Semivoa GCMS	Cl Biphen Cong/1 8C	4	uantity includes 8 stations 1 pre-pro ect trial .

Superset Summary

Service Request: K1411748 **SuperSet Reference:** 14-0000312048 rev 00

Analytical Method: **1668C**

Calibrations: 02/11/14

Data Files:

Raw Data	Begin CCAL	Method Blan	Lab ID
U238753	2387 1	2387 3	E 1 00022-01
U238760	2387 1	2387 3	E 1 00022-02
U238761	2387 1	2387 3	E 1 00022-03
U238855	2388 3	2388	E 1 00023-01
U238862	2388 3	2388	E 1 00023-02
U238863	2388 3	2388	E 1 00023-03
U238856	2388 3	2388	K1411748-003
U238857	2388 3	2388	K1411748-004
U238754	2387 1	2387 3	K1411748-00
U238755	2387 1	2387 3	K1411748-010
U238756	2387 1	2387 3	K1411748-013
U238757	2387 1	2387 3	K1411748-014
U238858	2388 3	2388	K1411748-017
U238859	2388 3	2388	K1411748-018
U238758	2387 1	2387 3	K1411748-023
U238759	2387 1	2387 3	K1411748-024
U238860	2388 3	2388	K1411748-02
U238861	2388 3	2388	K1411748-02

Calibrations: 10/08/14

Data Files:

Raw Data	Begin CCAL	Method Blan	Lab ID
U151536	1 1 3	1 1 3	E 1400 0-01
U151624	1 1 1	1 1 3	E 1400 0-02
U151634	1 1 32	1 1 3	E 1400 0-03
U151537	1 1 3	1 1 3	K1411748-001

Data Qualifiers

HRMS Qualifier Set

B Indicates the associated analyte was found in the method blank at >1/10th the reported value.

E Estimated value. The reported concentration is above the calibration range of the instrument.

H Sample extracted and/or analyzed out of suggested holding time.

J Estimated value. The reported concentration is below the MRL.

K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. Reported concentration is a conservative estimate, however EMPC correction was not applied.

P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.

Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.

S Signal saturated detector. Result reported from dilution.

U Compound was analyzed for, but was not detected (ND).

X See Case Narrative.

Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.

i The MDL/MRL have been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01	11/30/2015
Arizona Department of Health Services	AZ0793	5/27/2015
Arkansas Department of Environmental Quality	14-038-0	6/16/2015
California Department of Health Services	2452	2/28/2015
Florida Department of Health	E87611	6/30/2015
Hawaii Department of Health	TX02694	6/30/2015
Illinois Environmental Protection Agency	200057	10/6/2015
Louisiana Department of Health and Hospitals	TX2694	6/30/2015
Maine Center for Disease Control and Prevention	2014019	6/5/2016
Maryland Department of the Environment	343	6/30/2015
Michigan Depratment of Environmental Quality	9971	6/30/2015
Nebraska Department of Health and Human Services	NE-OS-25-13	6/30/2015
Nevada Department of Concervation and Natural Resources	TX014112013-2	7/31/2015
New Jersey Department of Environmental Protection	NLC140001	6/30/2015
New Mexico Environment Department	TX02694	6/30/2015
New York Department of Health	11707	4/1/2015
Oklahoma Department of Environmental Quality	2014-124	8/31/2015
Oregon Environmental Laboratory Accreditation Program	TX200002	3/24/2015
Pennsylvania Department of Environmental Protection	68-03441	6/30/2015
Tennessee Department of Environment and Concervation	04016	6/30/2015
Texas Commision on Environmental Quality	TX104704216-14-5	6/30/2015
United States Department of Agriculture	P330-14-00067	2/21/2017
Utah Department of Health Environmental Laboratory Certification	TX02694	7/31/2015
Washington Department of Health	c819	11/14/2015
West Virginia Department of Environmental Protection	347	6/30/2015

ALS ENVIRONMENTAL – Houston

Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 11/19/14 Analyst: cee Samples: 15,16,17,23

Second Level - Data Review – to be filled by person doing peer review

Date: 11/19/14 Analyst: [illegible] Samples: 015

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston

Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 11/13/14 Analyst: cee Samples: 1, 3, 4, 9, 10, 11, 12, 27

Second Level - Data Review – to be filled by person doing peer review

Date: 11/14/14 Analyst: [signature] Samples: 001, 003, 004, 009-012, 027

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID KA11748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
11/18/14	JC	018, 024, 028, 004DL, 012DL, 027DL

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
11/18/14	LKL	018, 024, 028, 004DL, 012DL, 027DL

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
11/17/14	JC	018DL, 028DL

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
11/18/14	LKL	018DL, 028DL

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
11/20/14	LL	015DL, 016, 017, 023

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
11/20/14	UU	015DL, 016, 017, 023

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level – Data Processing – to be filled by person generating the forms

Date: 1/30/15 Analyst: ca Samples: 3, 4, 17, 18, 25, 26

Second Level - Data Review – to be filled by person doing peer review

Date: 02/02/15 Analyst: VP Samples: 003, 004, 017, 018, 025, 026

PEER REVIEW PAGE

ALS ENVIRONMENTAL – Houston

Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1411748 DB-5 DB-5MSUI DB-225 SPB/Octyl

First Level - Data Processing - to be filled by person generating the forms

Date:	Analyst:	Samples:
1/12/15	LCC	9,10,13,14,23,24

Second Level - Data Review – to be filled by person doing peer review

Date:	Analyst:	Samples:
01/13/15	LKL	009RE, 010 RE, 013RE, 014 RE 023RE, 024 RE

PEER REVIEW PAGE

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM 11E
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

K1411748 5
Science and Engineering for the Environment, LLC
RM 11E

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Archive -20C Archive	Cl Biphen Cong 1668C
K1411748-001	RM11E-PWW007	1	PE	10/20/14		10/22/14	HOUSTON		IV
K1411748-002	RM11E-PWP007	1	PE	10/20/14		10/22/14	HOUSTON	IV	
K1411748-003	RM11E-PWW006A	2	PE	10/20/14		10/22/14	HOUSTON		IV
K1411748-004	RM11E-PWP006A	2	PE	10/20/14		10/22/14	HOUSTON		IV
K1411748-005	RM11E-PWW006B	1	PE	10/20/14		10/22/14	HOUSTON	IV	
K1411748-006	RM11E-PWP006B	1	PE	10/20/14		10/22/14	HOUSTON	IV	
K1411748-007	RM11E-PWW005B	1	PE	10/20/14	1508	10/22/14	HOUSTON	IV	
K1411748-008	RM11E-PWP005B	1	PE	10/20/14	1508	10/22/14	HOUSTON	IV	
K1411748-009	RM11E-PWW005A	2	PE	10/20/14	1508	10/22/14	HOUSTON		IV
K1411748-010	RM11E-PWP005A	2	PE	10/20/14	1508	10/22/14	HOUSTON		IV
K1411748-011	RM11E-PWW504	1	PE	10/20/14	1305	10/22/14	HOUSTON		IV

Special Instructions/Comments

Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

① PE strips (Extract entire strip & report in Mg/Kg)

② NOTE: Critical Due Date.

pH Checked _____

Turnaround Requirements

_____ **RUSH** (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

____ **STANDARD**

Requested FAX Date: _____

Requested Report Date: 11/13/14

Report Requirements

____ I. Results Only

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

X IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# K1411748

Bill to

Relinquished By: [signature] 10/22/14 1300

Received By: [signature] 10/23/14 1100

Airbill Number: _____

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM 11E
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

K1411748 5
Science and Engineering for the Environment, LLC
RM 11E

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Archive -20C Archive	Cl Biphen Cong 1668C
K1411748-012	RM11E-PWP504	1	PE	10/20/14	1305	10/22/14	HOUSTON		IV
K1411748-013	RM11E-PWW004B	1	PE	10/20/14	1305	10/22/14	HOUSTON	IV	
K1411748-014	RM11E-PWP004B	1	PE	10/20/14	1305	10/22/14	HOUSTON	IV	
K1411748-015	RM11E-PWP004A	1	PE	10/20/14	1305	10/22/14	HOUSTON		IV
K1411748-016	RM11E-PWW004A	1	PE	10/20/14	1305	10/22/14	HOUSTON		IV
K1411748-017	RM11E-PWW003A	2	PE	10/20/14		10/22/14	HOUSTON		IV
K1411748-018	RM11E-PWP003A	2	PE	10/20/14		10/22/14	HOUSTON		IV
K1411748-019	RM11E-PWW003B	1	PE	10/20/14		10/22/14	HOUSTON	IV	
K1411748-020	RM11E-PWP003B	1	PE	10/20/14		10/22/14	HOUSTON	IV	
K1411748-021	RM11E-PWW002B	1	PE	10/20/14	1018	10/22/14	HOUSTON	IV	
K1411748-022	RM11E-PWP002B	1	PE	10/20/14	1018	10/22/14	HOUSTON	IV	

Special Instructions/Comments

Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

(See Comments pg 1)

pH Checked _____

Turnaround Requirements

_____ **RUSH** (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

____ **STANDARD**

Requested FAX Date: _____

Requested Report Date: 11/13/14

Report Requirements

____ I. Results Only

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

X IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# K1411748

Bill to

Relinquished By: 10/22/14 1300 Received By: 10/23/14 1100 Airbill Number:

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM 11E
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

K1411748 5
Science and Engineering for the Environment, LLC
RM 11E

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Archive -20C Archive	Cl Biphen Cong 1668C
K1411748-023	RM11E-PWW002A	2	PE	10/20/14	1018	10/22/14	HOUSTON		IV
K1411748-024	RM11E-PWP002A	2	PE	10/20/14	1018	10/22/14	HOUSTON		IV
K1411748-025	RM11E-PWW001B	2	PE	10/20/14	1135	10/22/14	HOUSTON	IV	
K1411748-026	RM11E-PWP001B	2	PE	10/20/14	1135	10/22/14	HOUSTON	IV	
K1411748-027	RM11E-PWW001A	1	PE	10/20/14	1135	10/22/14	HOUSTON		IV
K1411748-028	RM11E-PWP001A	1	PE	10/20/14	1135	10/22/14	HOUSTON		IV

Test Comments
Cl Biphen Cong - 1668C K1411748-001 Quantity includes 8 stations + 1 pre-project trial = 9.

Special Instructions/Comments
Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.
(See comments pg. 1)

pH Checked _____

Turnaround Requirements
____ **RUSH** (Surcharges Apply)
PLEASE CIRCLE WORK DAYS
1 2 3 4 5
____ **STANDARD**
Requested FAX Date: _____
Requested Report Date: 11/13/14

Report Requirements
____ I. Results Only
____ II. Results + QC Summaries
____ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
PQL/MDL/J Y
EDD Y

Invoice Information
PO# K1411748
Bill to

Relinquished By: 10/22/14 1300 Received By: 10/23/14 1100 Airbill Number: _____

Cooler Receipt Form

ALS Environmental

Project Chemist: AK

Client/Project: Kelso - Sci. and Eng. for the Environment

Thermometer ID: 8M0

Date/Time Received: 10/23/14 1100 Initials: LOL

Date/Time Logged in: 10/23/14 1330 Initials: JLL

1. Method of delivery: ○ US Mail ☑ Fed Ex ○ UPS ○ DHL ○ Courier ○ Client

2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ☑ Yes ○ No

Were they intact? ☑ Yes ○ No ○ N/A

Were they signed and dated? ☑ Yes ○ No ○ N/A

If yes, how many and where? one front seal

4. Packing Material: ○ Inserts ○ Baggies ☑ Bubble Wrap ☑ Gel Packs ○ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ☑ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
5478 9738 6824		10/23/14	1120	JLL	1	☐
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: K1411748 5

Science and Engineering for the Environment, LLC

RM 11E

10450 Stancliff Rd., Suite 210
Houston, TX 77099
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www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 221665 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 10/28/14 07:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1400690-01	MB		1668C/Cl Biphen Cong		Solid	0.310g	
2	EQ1400690-02	LCS		1668C/Cl Biphen Cong		Solid	0.310g	
3	EQ1400690-03	DLCS		1668C/Cl Biphen Cong		Solid	0.310g	
4	K1411748-001	RM11E-PWW007	.01	1668C/Cl Biphen Cong		PE	0.674g	Light brown plastic strip
5	K1411748-003	RM11E-PWW006A	.04	1668C/Cl Biphen Cong		PE	0.175g	Brown plastic strip
6	K1411748-004	RM11E-PWP006A	.04	1668C/Cl Biphen Cong		PE	0.364g	Light brown plastic strip
7	K1411748-009	RM11E-PWW005A	.04	1668C/Cl Biphen Cong		PE	0.201g	Brown plastic strip
8	K1411748-010	RM11E-PWP005A	.04	1668C/Cl Biphen Cong		PE	0.424g	Light brown plastic strip
9	K1411748-011	RM11E-PWW504	.04	1668C/Cl Biphen Cong		PE	0.189g	Brown plastic strip
10	K1411748-012	RM11E-PWP504	.04	1668C/Cl Biphen Cong		PE	0.303g	Light brown plastic strip
11	K1411748-015	RM11E-PWP004A	.04	1668C/Cl Biphen Cong		PE	0.367g	Light brown plastic strip
12	K1411748-016	RM11E-PWW004A	.04	1668C/Cl Biphen Cong		PE	0.224g	Brown plastic strip
13	K1411748-017	RM11E-PWW003A	.04	1668C/Cl Biphen Cong		PE	0.230g	Light brown plastic strip
14	K1411748-018	RM11E-PWP003A	.04	1668C/Cl Biphen Cong		PE	0.349g	Light brown plastic strip
15	K1411748-023	RM11E-PWW002A	.01	1668C/Cl Biphen Cong		PE	0.172g	Brown plastic strip
16	K1411748-024	RM11E-PWP002A	.01	1668C/Cl Biphen Cong		PE	0.286g	Light brown plastic strip
17	K1411748-027	RM11E-PWW001A	.01	1668C/Cl Biphen Cong		PE	0.211g	Brown plastic strip
18	K1411748-028	RM11E-PWP001A	.01	1668C/Cl Biphen Cong		PE	0.487g	Light brown plastic strip

Preparation Information Benchsheet

Prep Run#: 221665 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 10/28/14 07:00 PM

Spiking Solutions

Name:	1668A Labeled Working Standard	Inventory ID	75876	Logbook Ref:	2-4 ng/ml 75876 WM10/20/14	Expires On:	10/20/2015

EQ1400690-01	1,000.00µL	EQ1400690-02	1,000.00µL	EQ1400690-03	1,000.00µL	K1411748-001	1,000.00µL	K1411748-003	1,000.00µL		

Name:	1668A Working Matrix Standard	Inventory ID	75995	Logbook Ref:	1-2ng/mL 75995 LM 10/22/14	Expires On:	12/13/2014

EQ1400690-02	1,000.00µL	EQ1400690-03	1,000.00µL

Name:	1668A Clean Up Working Standard	Inventory ID	75999	Logbook Ref:	100ng/mL 75999 LM 10/22/14	Expires On:	10/22/2015

EQ1400690-01	20.00µL	EQ1400690-02	20.00µL	EQ1400690-03	20.00µL	K1411748-001	20.00µL	K1411748-003	20.00µL	K1411748-004	20.00µL
K1411748-009	20.00µL	K1411748-010	20.00µL	K1411748-011	20.00µL	K1411748-012	20.00µL	K1411748-015	20.00µL	K1411748-016	20.00µL
K1411748-017	20.00µL	K1411748-018	20.00µL	K1411748-023	20.00µL	K1411748-024	20.00µL	K1411748-027	20.00µL	K1411748-028	20.00µL

Name:	1668A Labeled Working Standard	Inventory ID	76106	Logbook Ref:	2-4 ng/ml 76106 TL 10/27/14	Expires On:	10/27/2015

K1411748-004	1,000.00µL	K1411748-009	1,000.00µL	K1411748-010	1,000.00µL	K1411748-011	1,000.00µL	K1411748-012	1,000.00µL	K1411748-015	1,000.00µL
K1411748-016	1,000.00µL	K1411748-017	1,000.00µL	K1411748-018	1,000.00µL	K1411748-023	1,000.00µL	K1411748-024	1,000.00µL	K1411748-027	1,000.00µL
K1411748-028	1,000.00µL										

Preparation Materials

Glass Wool	AL 10/22/14 (75977)	Sulfuric Acid Reagent Grade H2SO4	LM 10/27/14 (76083)	Hexanes 95%	LM 11/7/14 (76451)
Dichloromethane (Methylene Chloride) 99.9% MeCl2	TL 10/9/14 (75556)	Sodium Hydroxide Reagent Grade NaOH	LM 09/02/14 (74232)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	AL 10/08/14 (75536)
Silica Gel Reagent Grade	LM 10/30/14 (76198)				

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	10/28/14 19:00	Started:	11/11/14 14:12	Started:	11/11/14 08:00	Started:	11/11/14 16:35
Finished:	10/28/14 22:00	Finished:	11/11/14 14:12	Finished:	11/11/14 11:45	Finished:	11/11/14 17:45
By:	HLEUNG	By:	CDIAZ	By:	CDIAZ	By:	DEDWARDS
Comments		Comments		Comments		Comments	

Comments: _____

Preparation Information Benchsheet

Prep Run#: 221665 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 10/28/14 07:00 PM

Reviewed By: ak Date: 11/17/14

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Preparation Information Benchsheet

Prep Run#: 226972 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 1/19/15 03:50 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1500023-01	MB		1668C/Cl Biphen Cong		Solid	1.4800mg	
2	EQ1500023-02	LCS		1668C/Cl Biphen Cong		Solid	1.4800mg	
3	EQ1500023-03	DLCS		1668C/Cl Biphen Cong		Solid	1.4800mg	
4	K1411748-003RE	RM11E-PWW006A	.04	1668C/Cl Biphen Cong		PE	0.9100mg	Dark brown PE strip
5	K1411748-004RE	RM11E-PWP006A	.04	1668C/Cl Biphen Cong		PE	2.0400mg	Clear colorless PE strip
6	K1411748-017RE	RM11E-PWW003A	.04	1668C/Cl Biphen Cong		PE	1.1500mg	Speckled PE strip
7	K1411748-018RE	RM11E-PWP003A	.04	1668C/Cl Biphen Cong		PE	1.9400mg	Clear colorless PE strip
8	K1411748-025	RM11E-PWW001B	.06	1668C/Cl Biphen Cong		PE	0.8800mg	Clear/brown PE strip
9	K1411748-026	RM11E-PWP001B	.06	1668C/Cl Biphen Cong		PE	1.9600mg	Clear strip / yellow strip

Spiking Solutions

Name: jk Inventory ID 76857 Logbook Ref: 76857 HLEUNG 11/24/14 Expires On: 07/27/2022

EQ1500023-01 2.00µL EQ1500023-02 2.00µL EQ1500023-03 2.00µL K1411748-003 2.00µL K1411748-004 2.00µL K1411748-017 2.00µL

Name: 1668A Clean Up Working Standard Inventory ID 77506 Logbook Ref: 77506 20ng/mL LM 12/18/14 Expires On: 12/18/2015

EQ1500023-01 100.00µL EQ1500023-02 100.00µL EQ1500023-03 100.00µL K1411748-003 100.00µL K1411748-004 100.00µL K1411748-017 100.00µL
K1411748-018 100.00µL K1411748-025 100.00µL K1411748-026 100.00µL

Name: 1668A Matrix Stock Solution Inventory ID 77715 Logbook Ref: 77715 100-200ng/mL LM 1/2/15 Expires On: 01/21/2021

EQ1500023-02 10.00µL EQ1500023-03 10.00µL

Name: 1668A Labeled Toxics/LOC/Window-Defining Sol Inventory ID 78158 Logbook Ref: 1-2 ug/mL 78158 TL 1/19/15 Expires On: 07/27/2022

K1411748-018 2.00µL K1411748-025 2.00µL K1411748-026 2.00µL

Preparation Materials

Hexanes 95% AL 1/15/15 (78091)

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	1/19/15 15:50	Started:	1/20/15 18:30	Started:	1/20/15 18:30	Started:	1/20/15 19:45
Finished:	1/20/15 18:30	Finished:	1/20/15 18:30	Finished:	1/20/15 18:30	Finished:	1/20/15 20:30
By:	HLEUNG	By:	HLEUNG	By:	HLEUNG	By:	HLEUNG
Comments		Comments		Comments		Comments	

Preparation Information Benchsheet

Prep Run#: 226972
Team: Semivoa GCMS/HLEUNG

Prep WorkFlow: OrgExtS(365)
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/19/15 03:50 PM

Comments:

Reviewed By: TL Date: 1/21/15

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined

Yes No

Preparation Information Benchsheet

Prep Run#: 226971 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 1/8/15 04:30 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1500022-01	MB		1668C/Cl Biphen Cong		Solid	13.600mg	
2	EQ1500022-02	LCS		1668C/Cl Biphen Cong		Solid	13.600mg	
3	EQ1500022-03	DLCS		1668C/Cl Biphen Cong		Solid	13.600mg	
4	K1411748-009RE	RM11E-PWW005A	.04	1668C/Cl Biphen Cong		PE	10.100mg	Light brown
5	K1411748-010RE	RM11E-PWP005A	.04	1668C/Cl Biphen Cong		PE	20.100mg	Clear
6	K1411748-013	RM11E-PWW004B	.05	1668C/Cl Biphen Cong		PE	10.300mg	Light brown
7	K1411748-014	RM11E-PWP004B	.05	1668C/Cl Biphen Cong		PE	16.300mg	Clear
8	K1411748-023RE	RM11E-PWW002A	.01	1668C/Cl Biphen Cong		PE	8.400mg	Clear with patches of brown
9	K1411748-024RE	RM11E-PWP002A	.01	1668C/Cl Biphen Cong		PE	16.300mg	Clear

Spiking Solutions

Name: 1668A Clean Up Working Standard Inventory ID 77506 Logbook Ref: 77506 20ng/mL LM 12/18/14 Expires On: 12/18/2015

EQ1500022-01	100.00µL	EQ1500022-02	100.00µL	EQ1500022-03	100.00µL	K1411748-009	100.00µL	K1411748-010	100.00µL	K1411748-013	100.00µL
K1411748-014	100.00µL	K1411748-023	100.00µL	K1411748-024	100.00µL						

Name: 1668A Matrix Stock Solution Inventory ID 77715 Logbook Ref: 77715 100-200ng/mL LM 1/2/15 Expires On: 01/21/2021

EQ1500022-02	10.00µL	EQ1500022-03	10.00µL

Name: 1668A Labeled Stock Standard Inventory ID 77869 Logbook Ref: 100-200ng/ml 77869 WM 1/7/15 Expires On: 01/07/2020

EQ1500022-01	20.00µL	EQ1500022-02	20.00µL	EQ1500022-03	20.00µL	K1411748-009	20.00µL	K1411748-010	20.00µL	K1411748-013	20.00µL
K1411748-014	20.00µL	K1411748-023	20.00µL	K1411748-024	20.00µL						

Preparation Materials

Hexanes 95%	LM 12/11/14 (77270)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	LM12/15/14 (77367)

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	1/8/15 16:30	Started:	1/9/15 17:30	Started:	1/9/15 17:30	Started:	1/9/15 19:00
Finished:	1/9/15 17:30	Finished:	1/9/15 17:30	Finished:	1/9/15 17:30	Finished:	1/9/15 19:25
By:	HLEUNG	By:	HLEUNG	By:	HLEUNG	By:	HLEUNG
Comments		Comments		Comments		Comments	

Preparation Information Benchsheet

Prep Run#: 226971 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/HLEUNG **Prep Method:** Method **Prep Date/Time:** 1/8/15 04:30 PM

Comments:

Reviewed By: TL Date: 1/14/15

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
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ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	133**B**		10.8	29.7	3.51	1.001	1
PCB 2	ND	U	12.3	29.7			1
PCB 3	22.2**BJ**		12.3	29.7	3.33	1.000	1
PCB 4	4070**B**		17.6	29.7	-	1.001	1
PCB 10	286**B**		13.7	74.2	-	1.010	1
PCB 9	20.0**J**		9.54	29.7	-	1.130	1
PCB 7	ND	U	8.79	29.7	-		1
PCB 6	53.4**B**		9.87	29.7	-	1.159	1
PCB 5	ND	U	9.23	29.7	-		1
PCB 8	115**B**		9.62	74.2	-	1.187	1
PCB 14	ND	U	9.24	29.7	-		1
PCB 11	619**B**		9.31	148	-	0.970	1
PCBs 12 + 13	50.4**BJ**		9.20	74.2	-	0.985	1
PCB 15	193**B**		9.95	29.7	-	1.001	1
PCB 19	4370**B**		17.4	29.7	1.00	1.001	1
PCB 18	74.0**BJ**		14.4	74.2	1.02	1.095	1
PCB 30	313**B**		19.8	74.2	0.97	1.103	1
PCB 17	790**B**		20.5	29.7	1.01	1.125	1
PCB 27	597**B**		14.6	29.7	1.04	1.138	1
PCB 24	ND	U	14.3	29.7			1
PCB 16	33.7**K**		24.1	29.7	0.73	1.152	1
PCB 32	310**BK**		13.7	29.7	1.75	1.178	1
PCB 34	ND	U	51.9	51.9			1
PCB 23	ND	U	51.1	51.1			1
PCBs 26 + 29	ND	U	51.3	74.2			1
PCB 25	206**B**		37.3	37.3	0.91	0.830	1
PCB 31	340**B**		52.3	74.2	1.06	0.842	1
PCBs 20 + 28	114000**B**		52.5	74.2	1.04	0.852	1
PCBs 21 + 33	ND	U	45.8	74.2			1
PCB 22	ND	U	50.6	50.6			1
PCB 36	ND	U	47.7	47.7			1
PCB 39	ND	U	44.7	44.7			1
PCB 38	ND	U	53.1	53.1			1
PCB 35	ND	U	52.2	52.2			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	61.9	61.9			1
PCB 54	17300**B**		9.87	29.7	0.74	1.001	1
PCBs 50 + 53	1390**B**		25.7	148	0.75	0.908	1
PCBs 45 + 51	964**BK**		26.9	74.2	0.61	0.936	1
PCB 46	ND	U	32.2	32.2			1
PCB 52	2740**B**		26.4	74.2	0.77	1.001	1
PCBs 43 + 73	ND	U	22.8	74.2			1
PCB 69	ND	U	16.6	148	0.74	1.019	1
PCB 49	4490**B**		26.7	148	0.74	1.019	1
PCB 48	ND	U	24.5	74.2			1
PCBs 44 + 47 + 65	261000**B**		21.6	148	0.74	1.040	1
PCBs 59 + 62 + 75	ND	U	19.6	148			1
PCB 42	ND	U	22.1	148			1
PCB 41	ND	U	31.5	148			1
PCBs 40 + 71	ND	U	23.9	148			1
PCB 64	ND	U	15.5	74.2			1
PCB 72	ND	U	19.3	74.2			1
PCB 68	ND	U	17.7	74.2			1
PCB 57	ND	U	20.9	74.2			1
PCB 58	ND	U	18.0	74.2			1
PCB 67	ND	U	19.1	74.2			1
PCB 63	ND	U	19.7	74.2			1
PCB 61	ND	U	19.8	297			1
PCBs 70 + 74 + 76	1100**B**		17.2	297	0.73	1.190	1
PCB 66	ND	U	19.5	74.2			1
PCB 55	ND	U	19.2	74.2			1
PCB 56	685**B**		22.9	74.2	0.79	0.908	1
PCB 60	88.6**K**		21.9	74.2	0.59	0.914	1
PCB 80	30.9**JK**		20.4	74.2	1.23	0.923	1
PCB 79	14500		20.9	74.2	0.76	0.970	1
PCB 78	ND	U	23.3	74.2			1
PCB 81	ND	U	24.1	29.7			1
PCB 77	ND	U	24.2	29.7			1
PCB 104	203**B**		14.6	29.7	1.66	1.002	1
PCB 96	231**B**		14.0	74.2	1.37	1.020	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	390**B**		15.7	74.2	1.73	1.087	1
PCB 94	156**BK**		17.6	74.2	1.91	1.098	1
PCBs 95 + 100	4060**B**		16.1	297	1.61	1.118	1
PCB 93	ND	U	20.2	297			1
PCBs 98 + 102	227**BJ**		14.6	297	1.71	1.130	1
PCB 88	ND	U	18.7	74.2			1
PCB 91	1050**B**		16.2	74.2	1.58	1.150	1
PCB 84	656**B**		20.3	29.7	1.55	1.161	1
PCB 89	ND	U	19.6	74.2			1
PCB 121	ND	U	18.2	74.2			1
PCB 92	ND	U	24.5	74.2			1
PCBs 90 + 101 + 113	ND	U	20.3	297			1
PCBs 83 + 99	ND	U	22.4	148			1
PCB 112	ND	U	17.6	74.2			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	543000**B**		19.5	297	1.54	1.036	1
PCBs 117 + 116	ND	U	17.8	148			1
PCB 85	ND	U	23.3	148			1
PCBs 110 + 115	ND	U	15.1	148			1
PCB 82	ND	U	29.8	74.2			1
PCB 111	911000		17.0	74.2	1.54	1.084	1
PCB 120	ND	U	17.2	74.2			1
PCBs 108 + 124	ND	U	76.0	148			1
PCB 107	271**BK**		82.9	82.9	1.83	0.997	1
PCB 123	ND	U	78.6	78.6			1
PCB 106	ND	U	85.8	85.8			1
PCB 118	1940**B**		71.4	71.4	1.69	1.000	1
PCB 122	ND	U	82.2	82.2			1
PCB 114	ND	U	76.5	76.5			1
PCB 105	591		72.7	72.7	1.50	1.001	1
PCB 127	ND	U	80.8	80.8			1
PCB 126	ND	U	65.4	65.4			1
PCB 155	ND	U	14.9	29.7			1
PCB 152	37.5**J**		13.9	74.2	1.24	1.013	1
PCB 150	60.2**BJ**		11.6	74.2	1.35	1.016	1
PCB 136	1320**B**		13.5	74.2	1.20	1.032	1
PCB 145	ND	U	12.5	74.2			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	19.4**BJK**		17.0	74.2	1.88	1.081	1
PCB 151	3220**B**		18.0	148	1.23	1.104	1
PCBs 135 + 154	1110**B**		15.2	148	1.42	1.107	1
PCB 144	360**B**		17.0	74.2	1.37	1.122	1
PCBs 147 + 149	5690**B**		49.2	148	1.25	0.893	1
PCB 134	ND	U	51.0	148			1
PCB 143	ND	U	59.3	148			1
PCBs 139 + 140	ND	U	51.5	148			1
PCB 131	ND	U	47.7	74.2			1
PCB 142	ND	U	63.3	74.2			1
PCB 132	ND	U	58.7	74.2			1
PCB 133	ND	U	59.7	74.2			1
PCB 165	ND	U	42.9	74.2			1
PCB 146	ND	U	50.7	74.2			1
PCB 161	ND	U	43.8	74.2			1
PCBs 153 + 168	896000		44.1	148	1.23	0.967	1
PCB 141	ND	U	56.9	74.2			1
PCB 130	ND	U	66.1	74.2			1
PCB 137	ND	U	53.4	74.2			1
PCB 164	ND	U	44.7	74.2			1
PCBs 129 + 138 + 163	7210**B**		58.0	297	1.27	1.000	1
PCB 160	ND	U	27.4	297			1
PCB 158	27300		40.5	74.2	1.24	1.010	1
PCB 166	ND	U	44.9	148			1
PCB 128	ND	U	54.9	148			1
PCB 159	91.0**B**		49.6	74.2	1.07	0.983	1
PCB 162	ND	U	43.6	74.2			1
PCB 167	210**BK**		38.4	38.4	1.47	1.001	1
PCBs 156 + 157	516**B**		67.7	67.7	1.22	1.000	1
PCB 169	ND	U	40.5	40.5			1
PCB 188	ND	U	14.1	29.7			1
PCB 179	ND	U	11.9	74.2			1
PCB 184	ND	U	10.6	74.2			1
PCB 176	ND	U	12.4	74.2			1
PCB 186	ND	U	11.3	74.2			1
PCB 178	879000		16.7	74.2	0.99	1.084	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 175	ND	U	15.7	74.2			1
PCB 187	2980**B**		13.4	74.2	0.99	1.109	1
PCB 182	ND	U	15.0	74.2			1
PCB 183	1490**B**		45.5	148	1.05	1.125	1
PCB 185	290**B**		40.7	148	0.96	1.129	1
PCB 174	2930**B**		44.5	74.2	0.94	1.134	1
PCB 177	1850**B**		48.0	74.2	0.94	1.146	1
PCB 181	ND	U	40.4	74.2			1
PCBs 171 + 173	971**B**		47.3	148	1.00	1.163	1
PCB 172	489**B**		48.8	74.2	0.91	0.899	1
PCB 192	ND	U	35.2	74.2			1
PCBs 180 + 193	6340**B**		33.8	148	0.98	0.912	1
PCB 191	129**B**		36.6	74.2	1.11	0.918	1
PCB 170	3100**B**		48.1	74.2	1.00	0.938	1
PCB 190	710**B**		35.4	74.2	1.00	0.948	1
PCB 189	113**B**		28.7	29.7	1.01	1.000	1
PCB 202	374**B**		13.8	29.7	0.87	1.000	1
PCB 201	158**B**		13.5	74.2	0.91	1.022	1
PCB 204	ND	U	13.6	74.2			1
PCB 197	55.4**BJK**		12.4	148	1.09	1.043	1
PCB 200	160**B**		13.8	148	0.89	1.047	1
PCBs 198 + 199	1470**B**		17.9	148	0.79	1.113	1
PCB 196	828**B**		18.6	74.2	0.85	0.917	1
PCB 203	757**B**		15.5	74.2	0.85	0.920	1
PCB 195	575**B**		19.4	74.2	0.91	0.947	1
PCB 194	1410**B**		19.2	74.2	0.85	0.991	1
PCB 205	67.2**B**		14.2	29.7	0.77	1.000	1
PCB 208	58.7**BK**		15.7	29.7	0.62	1.000	1
PCB 207	40.2**BJ**		20.4	74.2	0.84	1.019	1
PCB 206	283**B**		31.3	31.3	0.79	1.000	1
PCB 209	42.9		13.2	29.7	1.04	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	155		10.8	74.2			1
Total DiCB	5410		8.79	148			1
Total TriCB	121000		13.7	74.2			1
Total TetraCB	305000		9.87	297			1
Total PentaCB	1460000		14.0	297			1
Total HexaCB	943000		11.6	297			1
Total HeptaCB	901000		10.6	148			1
Total OctaCB	5850		12.4	148			1
Total NonaCB	381		15.7	74.2			1
Total PCBs	3750000		8.79	297			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	Percent
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 16:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.674g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151537	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	432.758	22		5-145	3.07	0.743
PCB 3L	2000	484.605	24		5-145	3.18	0.870
PCB 4L	2000	558.818	28		5-145	1.60	0.886
PCB 15L	2000	595.898	30		5-145	1.61	1.236
PCB 19L	2000	582.265	29		5-145	1.02	1.070
PCB 37L	2000	547.415	27		5-145	1.01	1.089
PCB 54L	2000	650.598	33		5-145	0.82	0.824
PCB 81L	2000	542.557	27		10-145	0.80	1.357
PCB 77L	2000	538.515	27		10-145	0.80	1.380
PCB 104L	2000	602.550	30		10-145	1.54	0.815
PCB 123L	2000	517.727	26		10-145	1.61	1.147
PCB 118L	2000	524.272	26		10-145	1.61	1.157
PCB 114L	2000	504.692	25		10-145	1.54	1.173
PCB 105L	2000	527.749	26		10-145	1.61	1.196
PCB 126L	2000	530.628	27		10-145	1.59	1.294
PCB 155L	2000	740.935	37		10-145	1.25	0.788
PCB 167L	2000	572.354	29		10-145	1.27	1.074
PCBs 156L + 157L	4000	1140.726	29		10-145	1.27	1.104
PCB 169L	2000	568.951	28		10-145	1.25	1.187
PCB 188L	2000	501.645	25		10-145	1.10	0.716
PCB 189L	2000	520.443	26		10-145	1.01	0.960
PCB 202L	2000	509.903	25		10-145	0.85	0.820
PCB 205L	2000	612.195	31		10-145	0.84	1.009
PCB 208L	2000	611.221	31		10-145	0.78	0.948
PCB 206L	2000	579.724	29		10-145	0.76	1.042
PCB 209L	2000	838.816	42		10-145	1.21	1.072
PCB 28L	2000	531.590	27		5-145	1.07	0.927
PCB 111L	2000	523.775	26		10-145	1.55	1.083
PCB 178L	2000	631.956	32		10-145	1.09	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW007	**Units:**	ng/Kg
Lab Code:	K1411748-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	24.1	29.7	1	0.0003	
PCB 77	ND	24.2	29.7	1	0.0001	
PCB 123	ND	78.6	78.6	1	0.00003	
PCB 118	**1940**	71.4	71.4	1	0.00003	0.0582
PCB 114	ND	76.5	76.5	1	0.00003	
PCB 105	**591**	72.7	72.7	1	0.00003	0.0177
PCB 126	ND	65.4	65.4	1	0.1	
PCB 167	**210**	38.4	38.4	1	0.00003	0.00630
PCBs 156 + 157	**516**	67.7	67.7	1	0.00003	0.0155
PCB 169	ND	40.5	40.5	1	0.03	
PCB 189	**113**	28.7	29.7	1	0.00003	0.00339
		Total TEQ				0.101

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	8720	22000			1
PCB 2	ND	U	13300	22000			1
PCB 3	ND	U	13900	22000			1
PCB 4	ND	U	5640	22000	-		1
PCB 10	ND	U	4650	54900	-		1
PCB 9	ND	U	6320	22000	-		1
PCB 7	ND	U	5060	22000	-		1
PCB 6	ND	U	5720	22000	-		1
PCB 5	ND	U	5640	22000	-		1
PCB 8	ND	U	5030	54900	-		1
PCB 14	ND	U	5750	22000	-		1
PCB 11	ND	U	6400	110000	-		1
PCBs 12 + 13	ND	U	5840	54900	-		1
PCB 15	ND	U	7710	22000	-		1
PCB 19	47400**K**		23400	23400	0.79	1.000	1
PCB 18	ND	U	19200	54900			1
PCB 30	ND	U	27300	54900			1
PCB 17	ND	U	28200	28200			1
PCB 27	ND	U	20100	22000			1
PCB 24	ND	U	18500	22000			1
PCB 16	ND	U	32300	32300			1
PCB 32	ND	U	18800	22000			1
PCB 34	ND	U	29400	29400			1
PCB 23	ND	U	23800	23800			1
PCBs 26 + 29	ND	U	25300	54900			1
PCB 25	ND	U	19800	22000			1
PCB 31	ND	U	24800	54900			1
PCBs 20 + 28	1480000		27500	54900	1.02	0.854	1
PCBs 21 + 33	ND	U	21900	54900			1
PCB 22	ND	U	25800	25800			1
PCB 36	ND	U	23900	23900			1
PCB 39	ND	U	22000	22000			1
PCB 38	ND	U	26800	26800			1
PCB 35	ND	U	28900	28900			1
PCB 37	ND	U	36600	36600			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	172000		13100	22000	0.67	1.001	1
PCBs 50 + 53	48900**JK**		18800	110000	1.63	0.912	1
PCBs 45 + 51	85700**K**		18400	54900	0.58	0.938	1
PCB 46	ND	U	22200	22200			1
PCB 52	56000		19300	54900	0.65	1.001	1
PCBs 43 + 73	ND	U	16900	54900			1
PCB 69	ND	U	11400	110000			1
PCB 49	100000**J**		16400	110000	0.74	1.020	1
PCB 48	ND	U	17000	54900			1
PCBs 44 + 47 + 65	4720000		16100	110000	0.77	1.039	1
PCBs 59 + 62 + 75	26100**JK**		20000	110000	0.24	1.050	1
PCB 42	ND	U	15300	110000			1
PCB 41	ND	U	23300	110000			1
PCBs 40 + 71	ND	U	18200	110000			1
PCB 64	ND	U	9620	54900			1
PCB 72	ND	U	14400	54900			1
PCB 68	ND	U	13400	54900			1
PCB 57	ND	U	15700	54900			1
PCB 58	ND	U	15000	54900			1
PCB 67	ND	U	13300	54900			1
PCB 63	ND	U	15100	54900			1
PCB 61	ND	U	15000	220000			1
PCBs 70 + 74 + 76	ND	U	13100	220000			1
PCB 66	ND	U	16100	54900			1
PCB 55	ND	U	16700	54900			1
PCB 56	ND	U	23200	54900			1
PCB 60	ND	U	20800	54900			1
PCB 80	ND	U	18800	54900			1
PCB 79	236000		20200	54900	0.71	0.968	1
PCB 78	ND	U	24300	54900			1
PCB 81	ND	U	26400	26400			1
PCB 77	ND	U	27200	27200			1
PCB 104	ND	U	12700	22000			1
PCB 96	ND	U	13100	54900			1
PCB 103	ND	U	15500	54900			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	17800	54900			1
PCBs 95 + 100	78100**J**		16100	220000	1.74	1.115	1
PCB 93	ND	U	18700	220000			1
PCBs 98 + 102	ND	U	15500	220000			1
PCB 88	ND	U	18900	54900			1
PCB 91	ND	U	15200	54900			1
PCB 84	ND	U	21300	22000			1
PCB 89	ND	U	35200	54900			1
PCB 121	ND	U	16200	54900			1
PCB 92	ND	U	27500	54900			1
PCBs 90 + 101 + 113	77600**JK**		23000	220000	3.97	1.001	1
PCBs 83 + 99	36800**JK**		26800	110000	0.81	1.018	1
PCB 112	ND	U	19300	54900			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	8760000		22300	220000	1.49	1.037	1
PCBs 117 + 116	ND	U	20100	110000			1
PCB 85	ND	U	26900	110000			1
PCBs 110 + 115	30000**J**		16400	110000	1.47	1.066	1
PCB 82	ND	U	41700	54900			1
PCB 111	12000000		17300	54900	1.54	1.080	1
PCB 120	ND	U	19200	54900			1
PCBs 108 + 124	ND	U	31000	110000			1
PCB 107	ND	U	33700	54900			1
PCB 123	ND	U	34200	34200			1
PCB 106	ND	U	31900	54900			1
PCB 118	ND	U	35400	35400			1
PCB 122	ND	U	36200	54900			1
PCB 114	ND	U	35500	35500			1
PCB 105	ND	U	36000	36000			1
PCB 127	ND	U	39000	54900			1
PCB 126	ND	U	34400	34400			1
PCB 155	ND	U	15700	22000			1
PCB 152	ND	U	18700	54900			1
PCB 150	ND	U	16900	54900			1
PCB 136	31500**J**		18600	54900	1.16	1.036	1
PCB 145	ND	U	16300	54900			1
PCB 148	ND	U	25900	54900			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	90600**J**		28400	110000	1.14	1.105	1
PCBs 135 + 154	30600**J**		22200	110000	1.21	1.108	1
PCB 144	ND	U	25200	54900			1
PCBs 147 + 149	160000**K**		21700	110000	1.58	0.895	1
PCB 134	ND	U	20100	110000			1
PCB 143	ND	U	26400	110000			1
PCBs 139 + 140	ND	U	21800	110000			1
PCB 131	ND	U	21500	54900			1
PCB 142	ND	U	27400	54900			1
PCB 132	45000**JK**		25000	54900	1.70	0.929	1
PCB 133	ND	U	26800	54900			1
PCB 165	ND	U	18000	54900			1
PCB 146	ND	U	20600	54900			1
PCB 161	ND	U	18900	54900			1
PCBs 153 + 168	11900000		19000	110000	1.31	0.966	1
PCB 141	ND	U	24200	54900			1
PCB 130	ND	U	28000	54900			1
PCB 137	ND	U	22700	54900			1
PCB 164	ND	U	18300	54900			1
PCBs 129 + 138 + 163	169000**JK**		27000	220000	0.94	1.000	1
PCB 160	ND	U	11100	220000			1
PCB 158	348000		17100	54900	1.10	1.009	1
PCB 166	ND	U	18200	110000			1
PCB 128	ND	U	24700	110000			1
PCB 159	ND	U	18700	54900			1
PCB 162	ND	U	17600	54900			1
PCB 167	ND	U	16300	22000			1
PCBs 156 + 157	ND	U	30200	44000			1
PCB 169	ND	U	15400	22000			1
PCB 188	ND	U	20500	22000			1
PCB 179	ND	U	17200	54900			1
PCB 184	ND	U	15500	54900			1
PCB 176	ND	U	17000	54900			1
PCB 186	ND	U	16400	54900			1
PCB 178	9190000		24900	54900	1.04	1.083	1
PCB 175	ND	U	23600	54900			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	58500**K**		19900	54900	1.88	1.107	1
PCB 182	ND	U	21700	54900			1
PCB 183	24000**J**		20600	110000	1.13	1.121	1
PCB 185	ND	U	20200	110000			1
PCB 174	54700**JK**		20200	54900	1.22	1.134	1
PCB 177	34900**JK**		22000	54900	0.49	1.145	1
PCB 181	ND	U	18900	54900			1
PCBs 171 + 173	ND	U	23700	110000			1
PCB 172	ND	U	23100	54900			1
PCB 192	ND	U	16800	54900			1
PCBs 180 + 193	87800**J**		16500	110000	0.89	0.911	1
PCB 191	ND	U	17700	54900			1
PCB 170	78000**K**		24900	54900	1.27	0.939	1
PCB 190	ND	U	15400	54900			1
PCB 189	ND	U	15700	22000			1
PCB 202	ND	U	14600	22000			1
PCB 201	ND	U	13800	54900			1
PCB 204	ND	U	13800	54900			1
PCB 197	ND	U	12900	110000			1
PCB 200	ND	U	14100	110000			1
PCBs 198 + 199	ND	U	19200	110000			1
PCB 196	ND	U	20000	54900			1
PCB 203	ND	U	17200	54900			1
PCB 195	ND	U	20400	54900			1
PCB 194	30900**J**		20500	54900	1.02	0.992	1
PCB 205	ND	U	17300	22000			1
PCB 208	ND	U	11800	22000			1
PCB 207	ND	U	13500	54900			1
PCB 206	ND	U	33300	33300			1
PCB 209	ND	U	17900	22000			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	8720	54900			1
Total DiCB	ND	U	4650	110000			1
Total TriCB	1520000		18500	54900			1
Total TetraCB	5450000		9620	220000			1
Total PentaCB	21000000		12700	220000			1
Total HexaCB	12700000		11100	220000			1
Total HeptaCB	9530000		15400	110000			1
Total OctaCB	30900**J**		12900	110000			1
Total NonaCB	ND	U	11800	54900			1
Total PCBs	50300000		4650	220000			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	Percent
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 17:37
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.9100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238856	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1293.950	65		5-145	3.39	0.750
PCB 3L	2000	1236.471	62		5-145	3.30	0.876
PCB 4L	2000	1369.317	68		5-145	1.54	0.891
PCB 15L	2000	1177.342	59		5-145	1.53	1.233
PCB 19L	2000	1327.750	66		5-145	1.02	1.071
PCB 37L	2000	1206.951	60		5-145	1.02	1.090
PCB 54L	2000	1649.923	82		5-145	0.82	0.831
PCB 81L	2000	1207.141	60		10-145	0.84	1.349
PCB 77L	2000	1209.670	60		10-145	0.86	1.373
PCB 104L	2000	1566.297	78		10-145	1.56	0.821
PCB 123L	2000	1197.007	60		10-145	1.61	1.144
PCB 118L	2000	1251.626	63		10-145	1.58	1.154
PCB 114L	2000	1259.134	63		10-145	1.57	1.171
PCB 105L	2000	1282.623	64		10-145	1.60	1.195
PCB 126L	2000	1212.156	61		10-145	1.63	1.290
PCB 155L	2000	1735.391	87		10-145	1.25	0.789
PCB 167L	2000	1301.001	65		10-145	1.27	1.072
PCBs 156L + 157L	4000	2700.991	68		10-145	1.27	1.105
PCB 169L	2000	1516.092	76		10-145	1.16	1.184
PCB 188L	2000	1216.343	61		10-145	1.07	0.718
PCB 189L	2000	1310.372	66		10-145	1.03	0.961
PCB 202L	2000	1245.025	62		10-145	0.89	0.821
PCB 205L	2000	1291.753	65		10-145	0.88	1.009
PCB 208L	2000	1407.237	70		10-145	0.76	0.947
PCB 206L	2000	1341.574	67		10-145	0.73	1.042
PCB 209L	2000	1414.628	71		10-145	1.25	1.071
PCB 28L	2000	1446.183	72		5-145	1.06	0.930
PCB 111L	2000	1417.655	71		10-145	1.63	1.079
PCB 178L	2000	1613.326	81		10-145	1.11	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW006A	**Units:**	ng/Kg
Lab Code:	K1411748-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	26400	26400	1	0.0003	
PCB 77	ND	27200	27200	1	0.0001	
PCB 123	ND	34200	34200	1	0.00003	
PCB 118	ND	35400	35400	1	0.00003	
PCB 114	ND	35500	35500	1	0.00003	
PCB 105	ND	36000	36000	1	0.00003	
PCB 126	ND	34400	34400	1	0.1	
PCB 167	ND	16300	22000	1	0.00003	
PCBs 156 + 157	ND	30200	44000	1	0.00003	
PCB 169	ND	15400	22000	1	0.03	
PCB 189	ND	15700	22000	1	0.00003	
	Total TEQ					0.00

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	3140	9800			1
PCB 2	ND	U	4370	9800			1
PCB 3	ND	U	4300	9800			1
PCB 4	214000		2180	9800	-	1.002	1
PCB 10	15700**J**		1780	24500	-	1.010	1
PCB 9	ND	U	1020	9800	-		1
PCB 7	ND	U	808	9800	-		1
PCB 6	ND	U	915	9800	-		1
PCB 5	ND	U	901	9800	-		1
PCB 8	16900**J**		804	24500	-	1.180	1
PCB 14	ND	U	919	9800	-		1
PCB 11	6540**J**		1030	49000	-	0.971	1
PCBs 12 + 13	ND	U	934	24500	-		1
PCB 15	66300		1230	9800	-	1.000	1
PCB 19	778000		6090	9800	1.01	1.002	1
PCB 18	28100**K**		5080	24500	1.58	1.086	1
PCB 30	32400		7220	24500	0.96	1.098	1
PCB 17	220000		7460	9800	0.96	1.119	1
PCB 27	73600		5310	9800	1.04	1.133	1
PCB 24	ND	U	4890	9800			1
PCB 16	ND	U	8530	9800			1
PCB 32	ND	U	4960	9800	1.00	1.171	1
PCB 34	ND	U	80600	80600			1
PCB 23	ND	U	65200	65200			1
PCBs 26 + 29	ND	U	69100	69100			1
PCB 25	ND	U	54100	54100			1
PCB 31	ND	U	67900	67900			1
PCBs 20 + 28	15800000		75200	75200	1.01	0.854	1
PCBs 21 + 33	ND	U	60000	60000			1
PCB 22	ND	U	70700	70700			1
PCB 36	ND	U	65400	65400			1
PCB 39	ND	U	60200	60200			1
PCB 38	ND	U	73400	73400			1
PCB 35	ND	U	79100	79100			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	102000	102000			1
PCB 54	12400000		2200	9800	0.75	1.001	1
PCBs 50 + 53	343000		9940	49000	0.78	0.912	1
PCBs 45 + 51	427000		9750	24500	0.75	0.939	1
PCB 46	ND	U	11800	11800			1
PCB 52	146000**K**		10200	24500	0.55	1.001	1
PCBs 43 + 73	ND	U	8940	24500			1
PCB 69	ND	U	6000	49000			1
PCB 49	329000		8680	49000	0.78	1.019	1
PCB 48	ND	U	9000	24500			1
PCBs 44 + 47 + 65	13400000		8510	49000	0.77	1.038	1
PCBs 59 + 62 + 75	ND	U	10600	49000			1
PCB 42	ND	U	8100	49000			1
PCB 41	ND	U	12400	49000			1
PCBs 40 + 71	ND	U	9640	49000			1
PCB 64	ND	U	5100	24500			1
PCB 72	ND	U	7590	24500			1
PCB 68	ND	U	7100	24500			1
PCB 57	ND	U	8300	24500			1
PCB 58	ND	U	7920	24500			1
PCB 67	ND	U	7040	24500			1
PCB 63	ND	U	7960	24500			1
PCB 61	ND	U	7950	98000			1
PCBs 70 + 74 + 76	ND	U	6910	98000			1
PCB 66	ND	U	8510	24500			1
PCB 55	ND	U	8840	24500			1
PCB 56	25900		4290	24500	0.79	0.911	1
PCB 60	ND	U	3840	24500			1
PCB 80	ND	U	3480	24500			1
PCB 79	460000		3730	24500	0.83	0.969	1
PCB 78	ND	U	4500	24500			1
PCB 81	ND	U	4930	9800			1
PCB 77	ND	U	4960	9800			1
PCB 104	ND	U	4340	9800			1
PCB 96	27200		4680	24500	1.46	1.022	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	27400**K**		5540	24500	1.24	1.084	1
PCB 94	19300**J**		6350	24500	1.53	1.097	1
PCBs 95 + 100	215000		5740	98000	1.67	1.116	1
PCB 93	ND	U	6680	98000			1
PCBs 98 + 102	14800**J**		5510	98000	1.55	1.126	1
PCB 88	ND	U	6740	24500			1
PCB 91	82200		5420	24500	1.60	1.146	1
PCB 84	ND	U	7610	9800			1
PCB 89	ND	U	8470	24500			1
PCB 121	ND	U	3900	24500			1
PCB 92	ND	U	6620	24500			1
PCBs 90 + 101 + 113	182000		5530	98000	1.40	1.001	1
PCBs 83 + 99	ND	U	6450	49000			1
PCB 112	ND	U	4630	24500			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	16300000		5360	98000	1.56	1.036	1
PCBs 117 + 116	ND	U	4830	49000			1
PCB 85	ND	U	6470	49000			1
PCBs 110 + 115	ND	U	3930	49000			1
PCB 82	ND	U	10100	24500			1
PCB 111	21000000		4150	24500	1.57	1.080	1
PCB 120	ND	U	4610	24500			1
PCBs 108 + 124	ND	U	15700	49000			1
PCB 107	ND	U	17000	24500			1
PCB 123	ND	U	18500	18500			1
PCB 106	ND	U	16100	24500			1
PCB 118	ND	U	17700	17700			1
PCB 122	ND	U	18300	24500			1
PCB 114	ND	U	17900	17900			1
PCB 105	ND	U	17200	17200			1
PCB 127	ND	U	19700	24500			1
PCB 126	ND	U	18700	18700			1
PCB 155	ND	U	3470	9800			1
PCB 152	ND	U	4040	24500			1
PCB 150	4580**J**		3660	24500	1.23	1.018	1
PCB 136	66200**K**		4020	24500	1.49	1.036	1
PCB 145	ND	U	3530	24500			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	ND	U	5620	24500			1
PCB 151	152000		6150	49000	1.13	1.105	1
PCBs 135 + 154	47000**J**		4810	49000	1.07	1.108	1
PCB 144	22100**J**		5460	24500	1.06	1.122	1
PCBs 147 + 149	299000		6120	49000	1.29	0.895	1
PCB 134	ND	U	5680	49000			1
PCB 143	ND	U	7460	49000			1
PCBs 139 + 140	ND	U	6150	49000			1
PCB 131	ND	U	6070	24500			1
PCB 142	ND	U	7740	24500			1
PCB 132	ND	U	7070	24500			1
PCB 133	ND	U	7560	24500			1
PCB 165	ND	U	5090	24500			1
PCB 146	ND	U	5820	24500			1
PCB 161	ND	U	5340	24500			1
PCBs 153 + 168	21800000		5370	49000	1.27	0.966	1
PCB 141	124000**K**		6830	24500	0.44	0.974	1
PCB 130	ND	U	7910	24500			1
PCB 137	ND	U	6420	24500			1
PCB 164	ND	U	5170	24500			1
PCBs 129 + 138 + 163	349000		7620	98000	1.19	1.000	1
PCB 160	ND	U	3130	98000			1
PCB 158	668000		4820	24500	1.08	1.008	1
PCB 166	ND	U	5130	49000			1
PCB 128	ND	U	6990	49000			1
PCB 159	ND	U	7580	24500			1
PCB 162	ND	U	7150	24500			1
PCB 167	7550**JK**		6150	9800	1.62	1.001	1
PCBs 156 + 157	21200**K**		12200	19600	1.92	0.998	1
PCB 169	ND	U	6710	9800			1
PCB 188	ND	U	5440	9800			1
PCB 179	56100		4480	24500	0.95	1.015	1
PCB 184	ND	U	4050	24500			1
PCB 176	ND	U	4450	24500			1
PCB 186	ND	U	4290	24500			1
PCB 178	18100000		6510	24500	1.05	1.083	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 175	ND	U	6160	24500			1
PCB 187	153000**K**		5210	24500	1.22	1.107	1
PCB 182	ND	U	5660	24500			1
PCB 183	85100**K**		7850	49000	1.22	1.123	1
PCB 185	15400**JK**		7720	49000	1.97	1.128	1
PCB 174	114000		7700	24500	1.10	1.134	1
PCB 177	95400**K**		8400	24500	1.27	1.145	1
PCB 181	ND	U	7220	24500			1
PCBs 171 + 173	37600**J**		9040	49000	1.08	1.161	1
PCB 172	27900**K**		8810	24500	0.83	0.899	1
PCB 192	ND	U	6400	24500			1
PCBs 180 + 193	286000		6310	49000	1.04	0.912	1
PCB 191	ND	U	6740	24500			1
PCB 170	128000		9520	24500	1.02	0.940	1
PCB 190	33500		5890	24500	1.21	0.948	1
PCB 189	ND	U	5910	9800			1
PCB 202	11400**K**		4280	9800	0.44	1.000	1
PCB 201	5360**JK**		4030	24500	1.08	1.022	1
PCB 204	ND	U	4050	24500			1
PCB 197	ND	U	3790	49000			1
PCB 200	8590**JK**		4140	49000	2.64	1.049	1
PCBs 198 + 199	56900		5620	49000	0.87	1.112	1
PCB 196	31600**K**		5880	24500	1.38	0.916	1
PCB 203	32200		5030	24500	0.77	0.920	1
PCB 195	22400**JK**		6000	24500	1.06	0.948	1
PCB 194	63900		6020	24500	0.86	0.992	1
PCB 205	ND	U	5100	9800			1
PCB 208	ND	U	4420	9800			1
PCB 207	ND	U	5090	24500			1
PCB 206	ND	U	9240	9800			1
PCB 209	ND	U	5150	9800			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	3140	24500			1
Total DiCB	319000		804	49000			1
Total TriCB	17000000		4890	24500			1
Total TetraCB	27600000		2200	98000			1
Total PentaCB	37900000		3900	98000			1
Total HexaCB	23600000		3130	98000			1
Total HeptaCB	19100000		4050	49000			1
Total OctaCB	232000		3790	49000			1
Total NonaCB	ND	U	4420	24500			1
Total PCBs	126000000		804	98000			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	Percent
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 18:42
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	2.0400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238857	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1376.533	69		5-145	3.03	0.751
PCB 3L	2000	1333.797	67		5-145	3.46	0.877
PCB 4L	2000	1484.791	74		5-145	1.61	0.891
PCB 15L	2000	1260.825	63		5-145	1.59	1.233
PCB 19L	2000	1530.830	77		5-145	1.07	1.071
PCB 37L	2000	1248.173	62		5-145	0.98	1.090
PCB 54L	2000	1836.075	92		5-145	0.84	0.831
PCB 81L	2000	1264.621	63		10-145	0.83	1.348
PCB 77L	2000	1345.483	67		10-145	0.84	1.372
PCB 104L	2000	1651.862	83		10-145	1.60	0.820
PCB 123L	2000	1183.621	59		10-145	1.53	1.144
PCB 118L	2000	1298.833	65		10-145	1.58	1.153
PCB 114L	2000	1273.850	64		10-145	1.71	1.171
PCB 105L	2000	1311.482	66		10-145	1.51	1.195
PCB 126L	2000	1184.213	59		10-145	1.72	1.290
PCB 155L	2000	1912.775	96		10-145	1.34	0.789
PCB 167L	2000	1443.465	72		10-145	1.22	1.072
PCBs 156L + 157L	4000	2966.908	74		10-145	1.28	1.105
PCB 169L	2000	1579.619	79		10-145	1.29	1.185
PCB 188L	2000	1339.241	67		10-145	0.99	0.718
PCB 189L	2000	1396.089	70		10-145	1.00	0.960
PCB 202L	2000	1399.361	70		10-145	0.90	0.821
PCB 205L	2000	1370.443	69		10-145	0.99	1.008
PCB 208L	2000	1651.909	83		10-145	0.82	0.947
PCB 206L	2000	1423.149	71		10-145	0.84	1.042
PCB 209L	2000	1512.913	76		10-145	1.14	1.070
PCB 28L	2000	1514.984	76		5-145	1.00	0.929
PCB 111L	2000	1537.301	77		10-145	1.64	1.079
PCB 178L	2000	1860.924	93		10-145	1.07	1.008

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP006A	**Units:**	ng/Kg
Lab Code:	K1411748-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	4930	9800	1	0.0003	
PCB 77	ND	4960	9800	1	0.0001	
PCB 123	ND	18500	18500	1	0.00003	
PCB 118	ND	17700	17700	1	0.00003	
PCB 114	ND	17900	17900	1	0.00003	
PCB 105	ND	17200	17200	1	0.00003	
PCB 126	ND	18700	18700	1	0.1	
PCB 167	**7550**	6150	9800	1	0.00003	0.227
PCBs 156 + 157	**21200**	12200	19600	1	0.00003	0.636
PCB 169	ND	6710	9800	1	0.03	
PCB 189	ND	5910	9800	1	0.00003	
		Total TEQ				0.863

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	206	1980			1
PCB 2	ND	U	255	1980			1
PCB 3	ND	U	259	1980			1
PCB 4	492**J**		132	1980	-	1.001	1
PCB 10	ND	U	105	4950	-		1
PCB 9	ND	U	121	1980	-		1
PCB 7	ND	U	103	1980	-		1
PCB 6	ND	U	113	1980	-		1
PCB 5	ND	U	121	1980	-		1
PCB 8	ND	U	104	4950	-		1
PCB 14	ND	U	116	1980	-		1
PCB 11	721**J**		119	9900	-	0.970	1
PCBs 12 + 13	ND	U	112	4950	-		1
PCB 15	ND	U	138	1980	-		1
PCB 19	1750**J**		401	1980	0.96	1.001	1
PCB 18	ND	U	350	4950			1
PCB 30	ND	U	477	4950			1
PCB 17	912**J**		486	1980	0.95	1.117	1
PCB 27	ND	U	383	1980			1
PCB 24	ND	U	311	1980			1
PCB 16	ND	U	561	1980			1
PCB 32	727**J**		331	1980	1.08	1.172	1
PCB 34	ND	U	460	1980			1
PCB 23	ND	U	390	1980			1
PCBs 26 + 29	ND	U	421	4950			1
PCB 25	ND	U	309	1980			1
PCB 31	ND	U	382	4950			1
PCBs 20 + 28	6950		405	4950	1.17	0.854	1
PCBs 21 + 33	ND	U	365	4950			1
PCB 22	ND	U	424	1980			1
PCB 36	ND	U	391	1980			1
PCB 39	ND	U	369	1980			1
PCB 38	ND	U	446	1980			1
PCB 35	ND	U	434	1980			1
PCB 37	ND	U	541	1980			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	5570		187	1980	0.80	1.001	1
PCBs 50 + 53	3610**J**		211	9900	0.70	0.911	1
PCBs 45 + 51	3760**J**		218	4950	0.69	0.939	1
PCB 46	ND	U	264	1980			1
PCB 52	7130		236	4950	0.83	1.001	1
PCBs 43 + 73	ND	U	189	4950			1
PCB 69	ND	U	131	9900			1
PCB 49	6500**J**		203	9900	0.81	1.018	1
PCB 48	ND	U	199	4950			1
PCBs 44 + 47 + 65	43900		184	9900	0.79	1.039	1
PCBs 59 + 62 + 75	395**JK**		157	9900	0.33	1.048	1
PCB 42	375**JK**		178	9900	0.45	1.061	1
PCB 41	ND	U	267	9900			1
PCBs 40 + 71	1030**J**		205	9900	0.75	1.081	1
PCB 64	418**JK**		113	4950	0.63	1.089	1
PCB 72	ND	U	158	4950			1
PCB 68	ND	U	146	4950			1
PCB 57	ND	U	175	4950			1
PCB 58	179**JK**		158	4950	1.10	1.154	1
PCB 67	ND	U	152	4950			1
PCB 63	ND	U	159	4950			1
PCB 61	ND	U	164	19800			1
PCBs 70 + 74 + 76	2530**J**		143	19800	0.83	1.185	1
PCB 66	1760**J**		173	4950	0.73	1.198	1
PCB 55	ND	U	176	4950			1
PCB 56	392**J**		155	4950	0.86	0.912	1
PCB 60	ND	U	149	4950			1
PCB 80	144**JK**		134	4950	0.49	0.921	1
PCB 79	3720**J**		145	4950	0.79	0.970	1
PCB 78	ND	U	162	4950			1
PCB 81	ND	U	186	1980			1
PCB 77	ND	U	189	1980			1
PCB 104	ND	U	286	1980			1
PCB 96	387**JK**		318	4950	0.50	1.023	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	1560**J**		380	4950	1.37	1.083	1
PCB 94	746**JK**		432	4950	0.83	1.095	1
PCBs 95 + 100	14100**J**		388	19800	1.54	1.115	1
PCB 93	ND	U	482	19800			1
PCBs 98 + 102	925**JK**		356	19800	0.90	1.124	1
PCB 88	ND	U	456	4950			1
PCB 91	3670**J**		379	4950	1.49	1.145	1
PCB 84	1130**J**		471	1980	1.38	1.159	1
PCB 89	ND	U	761	4950			1
PCB 121	ND	U	318	4950			1
PCB 92	ND	U	545	4950			1
PCBs 90 + 101 + 113	16100**J**		470	19800	1.60	1.001	1
PCBs 83 + 99	4590**JK**		536	9900	2.02	1.018	1
PCB 112	ND	U	383	4950			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	176000		439	19800	1.58	1.036	1
PCBs 117 + 116	ND	U	405	9900			1
PCB 85	ND	U	561	9900			1
PCBs 110 + 115	6440**J**		332	9900	1.46	1.065	1
PCB 82	ND	U	1190	4950			1
PCB 111	401000		288	4950	1.57	1.080	1
PCB 120	ND	U	359	4950			1
PCBs 108 + 124	ND	U	697	9900			1
PCB 107	ND	U	664	4950			1
PCB 123	ND	U	770	1980			1
PCB 106	ND	U	750	4950			1
PCB 118	5050		757	1980	1.64	1.001	1
PCB 122	ND	U	818	4950			1
PCB 114	ND	U	779	1980			1
PCB 105	1240**JK**		763	1980	2.44	1.000	1
PCB 127	ND	U	722	4950			1
PCB 126	ND	U	748	1980			1
PCB 155	ND	U	128	1980			1
PCB 152	ND	U	156	4950			1
PCB 150	221**J**		117	4950	1.11	1.019	1
PCB 136	4890**J**		146	4950	1.32	1.036	1
PCB 145	ND	U	130	4950			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	ND	U	191	4950			1
PCB 151	11200		223	9900	1.23	1.105	1
PCBs 135 + 154	2700**J**		157	9900	1.26	1.108	1
PCB 144	1260**J**		187	4950	1.24	1.122	1
PCBs 147 + 149	20100		286	9900	1.21	0.895	1
PCB 134	ND	U	256	9900			1
PCB 143	ND	U	387	9900			1
PCBs 139 + 140	ND	U	285	9900			1
PCB 131	ND	U	269	4950			1
PCB 142	ND	U	369	4950			1
PCB 132	5550		314	4950	1.32	0.930	1
PCB 133	ND	U	335	4950			1
PCB 165	ND	U	232	4950			1
PCB 146	2600**JK**		292	4950	0.88	0.951	1
PCB 161	ND	U	231	4950			1
PCBs 153 + 168	601000		240	9900	1.19	0.966	1
PCB 141	5350**K**		309	4950	1.00	0.974	1
PCB 130	ND	U	364	4950			1
PCB 137	ND	U	292	4950			1
PCB 164	1280**JK**		242	4950	0.88	0.994	1
PCBs 129 + 138 + 163	21400		347	19800	1.32	1.001	1
PCB 160	ND	U	141	19800			1
PCB 158	19700		216	4950	1.08	1.009	1
PCB 166	ND	U	241	9900			1
PCB 128	ND	U	317	9900			1
PCB 159	ND	U	329	4950			1
PCB 162	ND	U	313	4950			1
PCB 167	ND	U	273	1980			1
PCBs 156 + 157	1180**JK**		533	3960	0.78	1.001	1
PCB 169	ND	U	275	1980			1
PCB 188	ND	U	205	1980			1
PCB 179	2540**J**		167	4950	1.10	1.015	1
PCB 184	ND	U	147	4950			1
PCB 176	ND	U	171	4950			1
PCB 186	ND	U	160	4950			1
PCB 178	619000		236	4950	1.05	1.083	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 175	ND	U	222	4950			1
PCB 187	6530		194	4950	0.98	1.107	1
PCB 182	ND	U	220	4950			1
PCB 183	3220**J**		334	9900	1.11	1.122	1
PCB 185	685**JK**		325	9900	1.31	1.128	1
PCB 174	6830		360	4950	1.16	1.133	1
PCB 177	3330**JK**		379	4950	0.77	1.145	1
PCB 181	ND	U	318	4950			1
PCBs 171 + 173	1680**JK**		378	9900	0.82	1.161	1
PCB 172	734**J**		384	4950	1.05	0.899	1
PCB 192	ND	U	268	4950			1
PCBs 180 + 193	9250**J**		266	9900	1.05	0.912	1
PCB 191	ND	U	273	4950			1
PCB 170	6340		399	4950	0.93	0.939	1
PCB 190	1020**JK**		271	4950	1.31	0.949	1
PCB 189	ND	U	239	1980			1
PCB 202	378**J**		197	1980	0.96	1.000	1
PCB 201	ND	U	174	4950			1
PCB 204	ND	U	180	4950			1
PCB 197	ND	U	163	9900			1
PCB 200	ND	U	182	9900			1
PCBs 198 + 199	1680**J**		250	9900	0.76	1.112	1
PCB 196	537**J**		259	4950	0.84	0.916	1
PCB 203	ND	U	217	4950			1
PCB 195	750**JK**		272	4950	0.52	0.948	1
PCB 194	1460**J**		262	4950	0.83	0.992	1
PCB 205	ND	U	226	1980			1
PCB 208	ND	U	224	1980			1
PCB 207	ND	U	253	4950			1
PCB 206	ND	U	379	1980			1
PCB 209	1630**JK**		226	1980	0.98	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	206	4950			1
Total DiCB	1210**J**		103	9900			1
Total TriCB	10300		309	4950			1
Total TetraCB	81400		113	19800			1
Total PentaCB	633000		286	19800			1
Total HexaCB	699000		117	19800			1
Total HeptaCB	661000		147	9900			1
Total OctaCB	4800**J**		163	9900			1
Total NonaCB	ND	U	224	4950			1
Total PCBs	2090000		103	19800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	Percent
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 10:59
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238754	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1273.063	64		5-145	3.40	0.750
PCB 3L	2000	1321.085	66		5-145	3.32	0.875
PCB 4L	2000	1333.498	67		5-145	1.54	0.891
PCB 15L	2000	1282.367	64		5-145	1.58	1.231
PCB 19L	2000	1407.034	70		5-145	1.10	1.072
PCB 37L	2000	1287.961	64		5-145	1.01	1.089
PCB 54L	2000	1644.008	82		5-145	0.77	0.831
PCB 81L	2000	1233.877	62		10-145	0.76	1.347
PCB 77L	2000	1295.737	65		10-145	0.79	1.372
PCB 104L	2000	1594.204	80		10-145	1.53	0.821
PCB 123L	2000	1272.566	64		10-145	1.56	1.143
PCB 118L	2000	1324.896	66		10-145	1.63	1.153
PCB 114L	2000	1299.919	65		10-145	1.60	1.170
PCB 105L	2000	1360.797	68		10-145	1.56	1.194
PCB 126L	2000	1292.604	65		10-145	1.62	1.289
PCB 155L	2000	1975.234	99		10-145	1.23	0.789
PCB 167L	2000	1531.682	77		10-145	1.28	1.073
PCBs 156L + 157L	4000	3109.938	78		10-145	1.29	1.102
PCB 169L	2000	1651.375	83		10-145	1.28	1.185
PCB 188L	2000	1455.324	73		10-145	1.04	0.718
PCB 189L	2000	1486.983	74		10-145	1.01	0.960
PCB 202L	2000	1476.446	74		10-145	0.92	0.821
PCB 205L	2000	1388.505	69		10-145	0.85	1.009
PCB 208L	2000	1543.705	77		10-145	0.79	0.947
PCB 206L	2000	1534.307	77		10-145	0.79	1.042
PCB 209L	2000	1531.725	77		10-145	1.20	1.070
PCB 28L	2000	1426.530	71		5-145	1.04	0.929
PCB 111L	2000	1402.228	70		10-145	1.57	1.079
PCB 178L	2000	1684.207	84		10-145	1.03	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW005A	**Units:**	ng/Kg
Lab Code:	K1411748-009	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	186	1980	1	0.0003	
PCB 77	ND	189	1980	1	0.0001	
PCB 123	ND	770	1980	1	0.00003	
PCB 118	**5050**	757	1980	1	0.00003	0.152
PCB 114	ND	779	1980	1	0.00003	
PCB 105	**1240**	763	1980	1	0.00003	0.0372
PCB 126	ND	748	1980	1	0.1	
PCB 167	ND	273	1980	1	0.00003	
PCBs 156 + 157	**1180**	533	3960	1	0.00003	0.0354
PCB 169	ND	275	1980	1	0.03	
PCB 189	ND	239	1980	1	0.00003	
		Total TEQ				0.225

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	376**JK**		140	995	2.51	1.000	1
PCB 2	ND	U	169	995			1
PCB 3	ND	U	170	995			1
PCB 4	6220		73.3	995	-	1.001	1
PCB 10	479**J**		55.0	2490	-	1.011	1
PCB 9	297**J**		80.1	995	-	1.124	1
PCB 7	222**J**		67.9	995	-	1.132	1
PCB 6	1290		74.9	995	-	1.152	1
PCB 5	ND	U	80.2	995	-		1
PCB 8	2530		68.5	2490	-	1.180	1
PCB 14	ND	U	76.9	995	-		1
PCB 11	756**J**		79.0	4980	-	0.970	1
PCBs 12 + 13	243**J**		74.2	2490	-	0.984	1
PCB 15	2580		87.1	995	-	1.001	1
PCB 19	34100		244	995	1.06	1.001	1
PCB 18	973**JK**		213	2490	1.30	1.086	1
PCB 30	5750		290	2490	1.05	1.097	1
PCB 17	10100		296	995	1.02	1.117	1
PCB 27	3960		233	995	0.99	1.131	1
PCB 24	ND	U	189	995			1
PCB 16	1420		341	995	0.95	1.149	1
PCB 32	11900		201	995	1.01	1.172	1
PCB 34	ND	U	608	995			1
PCB 23	ND	U	516	995			1
PCBs 26 + 29	2520		557	2490	0.88	1.261	1
PCB 25	2040		409	995	0.96	0.833	1
PCB 31	4580		505	2490	1.00	0.845	1
PCBs 20 + 28	466000		536	2490	1.03	0.854	1
PCBs 21 + 33	2940**K**		483	2490	1.22	0.865	1
PCB 22	822**JK**		560	995	0.83	0.881	1
PCB 36	ND	U	517	995			1
PCB 39	ND	U	489	995			1
PCB 38	ND	U	590	995			1
PCB 35	ND	U	574	995			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	716	995			1
PCB 54	364000		98.6	995	0.77	1.001	1
PCBs 50 + 53	41700		255	4980	0.77	0.912	1
PCBs 45 + 51	31900		264	2490	0.75	0.939	1
PCB 46	1790		320	995	0.74	0.953	1
PCB 52	83300		285	2490	0.79	1.001	1
PCBs 43 + 73	ND	U	228	2490			1
PCB 69	ND	U	159	4980			1
PCB 49	56000		246	4980	0.78	1.018	1
PCB 48	ND	U	241	2490			1
PCBs 44 + 47 + 65	482000		222	4980	0.77	1.039	1
PCBs 59 + 62 + 75	1500**JK**		190	4980	0.93	1.048	1
PCB 42	1940**J**		215	4980	0.80	1.061	1
PCB 41	ND	U	323	4980			1
PCBs 40 + 71	9490		248	4980	0.72	1.081	1
PCB 64	1620**JK**		137	2490	0.57	1.089	1
PCB 72	ND	U	191	2490			1
PCB 68	ND	U	176	2490			1
PCB 57	ND	U	212	2490			1
PCB 58	1350**JK**		191	2490	0.51	1.153	1
PCB 67	ND	U	183	2490			1
PCB 63	ND	U	192	2490			1
PCB 61	ND	U	198	9950			1
PCBs 70 + 74 + 76	6530**J**		174	9950	0.83	1.185	1
PCB 66	4140		209	2490	0.84	1.198	1
PCB 55	ND	U	213	2490			1
PCB 56	2100**J**		190	2490	0.71	0.911	1
PCB 60	239**JK**		183	2490	1.85	0.918	1
PCB 80	288**JK**		164	2490	0.54	0.921	1
PCB 79	11900		178	2490	0.68	0.970	1
PCB 78	ND	U	198	2490			1
PCB 81	ND	U	231	995			1
PCB 77	ND	U	229	995			1
PCB 104	786**JK**		206	995	1.23	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	2480**J**		235	2490	1.69	1.022	1
PCB 103	6040		281	2490	1.49	1.083	1
PCB 94	2040**J**		320	2490	1.59	1.097	1
PCBs 95 + 100	73200		287	9950	1.59	1.115	1
PCB 93	ND	U	357	9950			1
PCBs 98 + 102	5720**J**		264	9950	1.65	1.125	1
PCB 88	ND	U	338	2490			1
PCB 91	12100		280	2490	1.61	1.145	1
PCB 84	5600**K**		348	995	1.96	1.159	1
PCB 89	ND	U	541	2490			1
PCB 121	ND	U	226	2490			1
PCB 92	8750		387	2490	1.55	0.983	1
PCBs 90 + 101 + 113	45900		334	9950	1.49	1.001	1
PCBs 83 + 99	10200		381	4980	1.56	1.018	1
PCB 112	ND	U	272	2490			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	560000		312	9950	1.59	1.036	1
PCBs 117 + 116	ND	U	288	4980			1
PCB 85	ND	U	399	4980			1
PCBs 110 + 115	19000		236	4980	1.59	1.065	1
PCB 82	ND	U	843	2490			1
PCB 111	611000		205	2490	1.56	1.080	1
PCB 120	ND	U	255	2490			1
PCBs 108 + 124	ND	U	596	4980			1
PCB 107	599**J**		568	2490	1.39	0.997	1
PCB 123	ND	U	673	995			1
PCB 106	ND	U	642	2490			1
PCB 118	7240		657	995	1.59	1.001	1
PCB 122	ND	U	700	2490			1
PCB 114	ND	U	664	995			1
PCB 105	1230		666	995	1.73	1.001	1
PCB 127	ND	U	617	2490			1
PCB 126	ND	U	667	995			1
PCB 155	ND	U	105	995			1
PCB 152	ND	U	127	2490			1
PCB 150	961**J**		95.1	2490	1.33	1.019	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	17300		119	2490	1.32	1.036	1
PCB 145	ND	U	106	2490			1
PCB 148	ND	U	156	2490			1
PCB 151	25700		182	4980	1.28	1.105	1
PCBs 135 + 154	8330		128	4980	1.12	1.108	1
PCB 144	3420		152	2490	1.21	1.122	1
PCBs 147 + 149	54700		346	4980	1.21	0.895	1
PCB 134	ND	U	310	4980			1
PCB 143	ND	U	468	4980			1
PCBs 139 + 140	ND	U	344	4980			1
PCB 131	ND	U	325	2490			1
PCB 142	ND	U	446	2490			1
PCB 132	12600		380	2490	1.19	0.930	1
PCB 133	ND	U	405	2490			1
PCB 165	ND	U	281	2490			1
PCB 146	6570		353	2490	1.05	0.951	1
PCB 161	ND	U	279	2490			1
PCBs 153 + 168	802000		290	4980	1.24	0.966	1
PCB 141	8570		373	2490	1.26	0.974	1
PCB 130	ND	U	439	2490			1
PCB 137	ND	U	352	2490			1
PCB 164	2120**JK**		293	2490	0.96	0.994	1
PCBs 129 + 138 + 163	38600		419	9950	1.22	1.000	1
PCB 160	ND	U	170	9950			1
PCB 158	23700		261	2490	1.29	1.009	1
PCB 166	ND	U	291	4980			1
PCB 128	ND	U	382	4980			1
PCB 159	ND	U	286	2490			1
PCB 162	ND	U	271	2490			1
PCB 167	654**J**		235	995	1.29	1.000	1
PCBs 156 + 157	1770**J**		474	1990	1.27	1.001	1
PCB 169	ND	U	229	995			1
PCB 188	ND	U	103	995			1
PCB 179	5310		83.1	2490	1.03	1.015	1
PCB 184	ND	U	73.3	2490			1
PCB 176	ND	U	85.4	2490			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 186	ND	U	80.0	2490			1
PCB 178	733000		118	2490	1.05	1.083	1
PCB 175	1300**JK**		111	2490	1.54	1.099	1
PCB 187	10500		96.9	2490	1.10	1.107	1
PCB 182	ND	U	110	2490			1
PCB 183	4620**J**		178	4980	1.13	1.122	1
PCB 185	879**JK**		173	4980	0.69	1.128	1
PCB 174	9960		192	2490	0.93	1.133	1
PCB 177	5780		202	2490	1.09	1.145	1
PCB 181	ND	U	169	2490			1
PCBs 171 + 173	2650**JK**		201	4980	0.87	1.161	1
PCB 172	1180**JK**		204	2490	1.47	0.899	1
PCB 192	ND	U	143	2490			1
PCBs 180 + 193	12300		142	4980	1.02	0.912	1
PCB 191	380**JK**		146	2490	1.32	0.918	1
PCB 170	7490**K**		213	2490	1.25	0.940	1
PCB 190	1530**JK**		145	2490	0.88	0.949	1
PCB 189	ND	U	128	995			1
PCB 202	552**JK**		107	995	0.60	1.000	1
PCB 201	ND	U	94.3	2490			1
PCB 204	ND	U	97.6	2490			1
PCB 197	ND	U	88.3	4980			1
PCB 200	ND	U	98.3	4980			1
PCBs 198 + 199	2040**JK**		136	4980	1.03	1.112	1
PCB 196	941**J**		141	2490	0.89	0.917	1
PCB 203	1050**J**		118	2490	0.89	0.920	1
PCB 195	756**J**		148	2490	1.01	0.948	1
PCB 194	1910**J**		142	2490	0.85	0.992	1
PCB 205	163**J**		123	995	0.95	1.000	1
PCB 208	162**JK**		111	995	1.29	1.000	1
PCB 207	ND	U	122	2490			1
PCB 206	ND	U	226	995			1
PCB 209	1340		123	995	1.11	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	376	**J**	140	2490			1
Total DiCB	14600		55.0	4980			1
Total TriCB	547000		189	2490			1
Total TetraCB	1100000		98.6	9950			1
Total PentaCB	1370000		205	9950			1
Total HexaCB	1010000		95.1	9950			1
Total HeptaCB	797000		73.3	4980			1
Total OctaCB	7410		88.3	4980			1
Total NonaCB	162	**J**	111	2490			1
Total PCBs	4850000		55.0	9950			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	Percent
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 12:04
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	20.100mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238755	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1313.360	66		5-145	3.31	0.750
PCB 3L	2000	1264.642	63		5-145	3.30	0.875
PCB 4L	2000	1327.339	66		5-145	1.54	0.891
PCB 15L	2000	1315.674	66		5-145	1.55	1.231
PCB 19L	2000	1459.172	73		5-145	1.07	1.072
PCB 37L	2000	1368.178	68		5-145	1.09	1.089
PCB 54L	2000	1677.549	84		5-145	0.81	0.831
PCB 81L	2000	1261.054	63		10-145	0.76	1.347
PCB 77L	2000	1336.298	67		10-145	0.79	1.372
PCB 104L	2000	1725.850	86		10-145	1.59	0.821
PCB 123L	2000	1316.125	66		10-145	1.59	1.143
PCB 118L	2000	1384.942	69		10-145	1.66	1.153
PCB 114L	2000	1365.736	68		10-145	1.59	1.170
PCB 105L	2000	1386.944	69		10-145	1.59	1.194
PCB 126L	2000	1322.898	66		10-145	1.60	1.289
PCB 155L	2000	2035.744	102		10-145	1.20	0.789
PCB 167L	2000	1555.572	78		10-145	1.27	1.073
PCBs 156L + 157L	4000	3145.695	79		10-145	1.27	1.102
PCB 169L	2000	1705.236	85		10-145	1.27	1.185
PCB 188L	2000	1489.186	74		10-145	1.03	0.718
PCB 189L	2000	1513.529	76		10-145	1.03	0.960
PCB 202L	2000	1490.725	75		10-145	0.94	0.821
PCB 205L	2000	1409.129	70		10-145	0.89	1.009
PCB 208L	2000	1503.042	75		10-145	0.80	0.947
PCB 206L	2000	1542.379	77		10-145	0.79	1.042
PCB 209L	2000	1555.385	78		10-145	1.19	1.070
PCB 28L	2000	1491.902	75		5-145	1.05	0.929
PCB 111L	2000	1393.323	70		10-145	1.57	1.079
PCB 178L	2000	1709.976	85		10-145	1.11	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP005A	**Units:**	ng/Kg
Lab Code:	K1411748-010	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	231	995	1	0.0003	
PCB 77	ND	229	995	1	0.0001	
PCB 123	ND	673	995	1	0.00003	
PCB 118	**7240**	657	995	1	0.00003	0.217
PCB 114	ND	664	995	1	0.00003	
PCB 105	**1230**	666	995	1	0.00003	0.0369
PCB 126	ND	667	995	1	0.1	
PCB 167	**654**	235	995	1	0.00003	0.0196
PCBs 156 + 157	**1770**	474	1990	1	0.00003	0.0531
PCB 169	ND	229	995	1	0.03	
PCB 189	ND	128	995	1	0.00003	
	Total TEQ					0.327

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	265	1940			1
PCB 2	ND	U	339	1940			1
PCB 3	ND	U	357	1940			1
PCB 4	2110		121	1940	-	1.001	1
PCB 10	ND	U	97.4	4850	-		1
PCB 9	ND	U	141	1940	-		1
PCB 7	ND	U	120	1940	-		1
PCB 6	ND	U	132	1940	-		1
PCB 5	ND	U	142	1940	-		1
PCB 8	ND	U	121	4850	-		1
PCB 14	ND	U	136	1940	-		1
PCB 11	696**J**		139	9710	-	0.970	1
PCBs 12 + 13	ND	U	131	4850	-		1
PCB 15	392**J**		162	1940	-	1.001	1
PCB 19	8520		472	1940	1.01	1.001	1
PCB 18	ND	U	412	4850			1
PCB 30	940**JK**		562	4850	0.83	1.097	1
PCB 17	4570		573	1940	0.98	1.117	1
PCB 27	1390**J**		452	1940	1.07	1.131	1
PCB 24	ND	U	366	1940			1
PCB 16	ND	U	661	1940			1
PCB 32	2150		389	1940	1.08	1.172	1
PCB 34	ND	U	641	1940			1
PCB 23	ND	U	544	1940			1
PCBs 26 + 29	ND	U	587	4850			1
PCB 25	ND	U	432	1940			1
PCB 31	ND	U	532	4850			1
PCBs 20 + 28	5890		566	4850	1.13	0.855	1
PCBs 21 + 33	ND	U	509	4850			1
PCB 22	ND	U	591	1940			1
PCB 36	ND	U	545	1940			1
PCB 39	ND	U	515	1940			1
PCB 38	ND	U	622	1940			1
PCB 35	ND	U	606	1940			1
PCB 37	ND	U	756	1940			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	6350		163	1940	0.75	1.001	1
PCBs 50 + 53	16300		444	9710	0.80	0.912	1
PCBs 45 + 51	18600		459	4850	0.74	0.939	1
PCB 46	902**JK**		556	1940	1.54	0.952	1
PCB 52	25800		496	4850	0.79	1.001	1
PCBs 43 + 73	ND	U	397	4850			1
PCB 69	ND	U	276	9710			1
PCB 49	24300		427	9710	0.72	1.018	1
PCB 48	ND	U	419	4850			1
PCBs 44 + 47 + 65	88400		386	9710	0.78	1.039	1
PCBs 59 + 62 + 75	2000**J**		331	9710	0.69	1.048	1
PCB 42	1010**J**		374	9710	0.80	1.061	1
PCB 41	ND	U	562	9710			1
PCBs 40 + 71	3620**JK**		432	9710	0.61	1.081	1
PCB 64	645**JK**		237	4850	0.60	1.089	1
PCB 72	ND	U	332	4850			1
PCB 68	ND	U	307	4850			1
PCB 57	ND	U	368	4850			1
PCB 58	1020**J**		332	4850	0.79	1.154	1
PCB 67	ND	U	319	4850			1
PCB 63	ND	U	334	4850			1
PCB 61	ND	U	345	19400			1
PCBs 70 + 74 + 76	4010**J**		302	19400	0.78	1.185	1
PCB 66	2650**J**		363	4850	0.72	1.198	1
PCB 55	ND	U	370	4850			1
PCB 56	375**JK**		218	4850	1.10	0.911	1
PCB 60	ND	U	210	4850			1
PCB 80	195**JK**		188	4850	0.41	0.920	1
PCB 79	5400		204	4850	0.85	0.970	1
PCB 78	ND	U	227	4850			1
PCB 81	ND	U	265	1940			1
PCB 77	ND	U	268	1940			1
PCB 104	1140**J**		398	1940	1.66	1.001	1
PCB 96	1890**JK**		458	4850	1.87	1.022	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	5150		548	4850	1.50	1.083	1
PCB 94	2170**J**		624	4850	1.58	1.097	1
PCBs 95 + 100	38100		559	19400	1.59	1.115	1
PCB 93	ND	U	695	19400			1
PCBs 98 + 102	2040**J**		514	19400	1.62	1.125	1
PCB 88	ND	U	659	4850			1
PCB 91	12100		547	4850	1.64	1.146	1
PCB 84	2660**K**		679	1940	1.79	1.159	1
PCB 89	ND	U	1030	4850			1
PCB 121	ND	U	429	4850			1
PCB 92	6210		736	4850	1.63	0.984	1
PCBs 90 + 101 + 113	31700		634	19400	1.55	1.001	1
PCBs 83 + 99	10700		723	9710	1.77	1.018	1
PCB 112	ND	U	517	4850			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	231000		593	19400	1.59	1.037	1
PCBs 117 + 116	ND	U	547	9710			1
PCB 85	ND	U	758	9710			1
PCBs 110 + 115	11600		448	9710	1.48	1.065	1
PCB 82	ND	U	1610	4850			1
PCB 111	530000		389	4850	1.58	1.080	1
PCB 120	ND	U	484	4850			1
PCBs 108 + 124	ND	U	930	9710			1
PCB 107	ND	U	886	4850			1
PCB 123	ND	U	1050	1940			1
PCB 106	ND	U	1010	4850			1
PCB 118	6720		1020	1940	1.64	1.001	1
PCB 122	ND	U	1100	4850			1
PCB 114	ND	U	1050	1940			1
PCB 105	1850**JK**		1040	1940	1.23	1.001	1
PCB 127	ND	U	963	4850			1
PCB 126	ND	U	1030	1940			1
PCB 155	ND	U	174	1940			1
PCB 152	ND	U	209	4850			1
PCB 150	1010**JK**		157	4850	1.60	1.018	1
PCB 136	11500		196	4850	1.26	1.036	1
PCB 145	ND	U	174	4850			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	388**JK**		256	4850	1.74	1.081	1
PCB 151	22500		299	9710	1.41	1.105	1
PCBs 135 + 154	6890**J**		210	9710	1.19	1.107	1
PCB 144	2450**J**		250	4850	1.16	1.121	1
PCBs 147 + 149	44300		596	9710	1.17	0.895	1
PCB 134	ND	U	533	9710			1
PCB 143	ND	U	806	9710			1
PCBs 139 + 140	ND	U	593	9710			1
PCB 131	ND	U	559	4850			1
PCB 142	ND	U	768	4850			1
PCB 132	10000		655	4850	1.37	0.930	1
PCB 133	ND	U	698	4850			1
PCB 165	ND	U	484	4850			1
PCB 146	7390		607	4850	1.31	0.951	1
PCB 161	ND	U	481	4850			1
PCBs 153 + 168	943000		500	9710	1.23	0.966	1
PCB 141	10000		643	4850	1.28	0.974	1
PCB 130	ND	U	757	4850			1
PCB 137	ND	U	607	4850			1
PCB 164	ND	U	505	4850			1
PCBs 129 + 138 + 163	41700		723	19400	1.18	1.000	1
PCB 160	ND	U	293	19400			1
PCB 158	33300		450	4850	1.16	1.008	1
PCB 166	ND	U	501	9710			1
PCB 128	ND	U	659	9710			1
PCB 159	ND	U	531	4850			1
PCB 162	ND	U	504	4850			1
PCB 167	531**JK**		436	1940	1.01	1.001	1
PCBs 156 + 157	1670**J**		864	3880	1.23	0.998	1
PCB 169	ND	U	431	1940			1
PCB 188	ND	U	328	1940			1
PCB 179	5850		267	4850	1.08	1.015	1
PCB 184	ND	U	236	4850			1
PCB 176	ND	U	275	4850			1
PCB 186	ND	U	257	4850			1
PCB 178	997000		379	4850	1.05	1.083	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 175	1860**JK**		357	4850	0.81	1.099	1
PCB 187	11600		312	4850	1.12	1.107	1
PCB 182	ND	U	352	4850			1
PCB 183	5460**J**		680	9710	1.16	1.122	1
PCB 185	1330**JK**		661	9710	2.13	1.127	1
PCB 174	9280		733	4850	1.02	1.133	1
PCB 177	6520		771	4850	1.04	1.144	1
PCB 181	ND	U	646	4850			1
PCBs 171 + 173	2520**JK**		769	9710	1.23	1.160	1
PCB 172	1330**J**		780	4850	1.04	0.899	1
PCB 192	ND	U	545	4850			1
PCBs 180 + 193	15200		540	9710	1.12	0.912	1
PCB 191	ND	U	555	4850			1
PCB 170	8450		812	4850	1.06	0.939	1
PCB 190	1920**J**		551	4850	0.91	0.949	1
PCB 189	ND	U	487	1940			1
PCB 202	800**J**		452	1940	0.80	1.000	1
PCB 201	ND	U	396	4850			1
PCB 204	ND	U	410	4850			1
PCB 197	ND	U	371	9710			1
PCB 200	ND	U	413	9710			1
PCBs 198 + 199	3280**JK**		570	9710	1.28	1.112	1
PCB 196	1760**JK**		589	4850	0.69	0.917	1
PCB 203	1540**JK**		493	4850	0.70	0.920	1
PCB 195	917**JK**		620	4850	1.32	0.948	1
PCB 194	2120**JK**		597	4850	1.13	0.991	1
PCB 205	ND	U	508	1940			1
PCB 208	ND	U	338	1940			1
PCB 207	ND	U	373	4850			1
PCB 206	703**JK**		479	1940	1.23	1.000	1
PCB 209	1260**JK**		306	1940	1.35	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	265	4850			1
Total DiCB	3200**J**		97.4	9710			1
Total TriCB	23500		366	4850			1
Total TetraCB	202000		163	19400			1
Total PentaCB	895000		389	19400			1
Total HexaCB	1140000		157	19400			1
Total HeptaCB	1070000		236	9710			1
Total OctaCB	10400		371	9710			1
Total NonaCB	703**J**		338	4850			1
Total PCBs	3340000		97.4	19400			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	Percent
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 13:09
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	10.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238756	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1375.320	69		5-145	3.32	0.750
PCB 3L	2000	1331.401	67		5-145	3.39	0.876
PCB 4L	2000	1478.076	74		5-145	1.56	0.891
PCB 15L	2000	1404.346	70		5-145	1.60	1.232
PCB 19L	2000	1496.677	75		5-145	1.07	1.072
PCB 37L	2000	1412.151	71		5-145	1.04	1.089
PCB 54L	2000	1814.013	91		5-145	0.82	0.831
PCB 81L	2000	1350.114	68		10-145	0.80	1.347
PCB 77L	2000	1401.533	70		10-145	0.78	1.372
PCB 104L	2000	1752.500	88		10-145	1.48	0.821
PCB 123L	2000	1388.351	69		10-145	1.55	1.144
PCB 118L	2000	1417.213	71		10-145	1.57	1.154
PCB 114L	2000	1377.539	69		10-145	1.58	1.171
PCB 105L	2000	1438.194	72		10-145	1.58	1.195
PCB 126L	2000	1352.447	68		10-145	1.58	1.289
PCB 155L	2000	2078.620	104		10-145	1.23	0.789
PCB 167L	2000	1642.456	82		10-145	1.26	1.073
PCBs 156L + 157L	4000	3359.885	84		10-145	1.28	1.105
PCB 169L	2000	1827.844	91		10-145	1.31	1.185
PCB 188L	2000	1548.567	77		10-145	1.02	0.718
PCB 189L	2000	1603.030	80		10-145	1.00	0.960
PCB 202L	2000	1547.744	77		10-145	0.95	0.821
PCB 205L	2000	1496.285	75		10-145	0.94	1.009
PCB 208L	2000	1612.020	81		10-145	0.80	0.948
PCB 206L	2000	1627.435	81		10-145	0.78	1.042
PCB 209L	2000	1667.074	83		10-145	1.17	1.070
PCB 28L	2000	1578.364	79		5-145	1.05	0.929
PCB 111L	2000	1517.174	76		10-145	1.59	1.079
PCB 178L	2000	1856.542	93		10-145	1.05	1.007

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW004B	**Units:**	ng/Kg
Lab Code:	K1411748-013	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	265	1940	1	0.0003	
PCB 77	ND	268	1940	1	0.0001	
PCB 123	ND	1050	1940	1	0.00003	
PCB 118	**6720**	1020	1940	1	0.00003	0.202
PCB 114	ND	1050	1940	1	0.00003	
PCB 105	**1850**	1040	1940	1	0.00003	0.0555
PCB 126	ND	1030	1940	1	0.1	
PCB 167	**531**	436	1940	1	0.00003	0.0159
PCBs 156 + 157	**1670**	864	3880	1	0.00003	0.0501
PCB 169	ND	431	1940	1	0.03	
PCB 189	ND	487	1940	1	0.00003	
	Total TEQ					0.324

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	3060		167	1230	3.03	1.001	1
PCB 2	ND	U	205	1230			1
PCB 3	ND	U	209	1230			1
PCB 4	314000		93.2	1230	-	1.001	1
PCB 10	17600		73.4	3070	-	1.010	1
PCB 9	1150**J**		102	1230	-	1.123	1
PCB 7	907**J**		86.2	1230	-	1.131	1
PCB 6	2720		95.1	1230	-	1.153	1
PCB 5	ND	U	102	1230	-		1
PCB 8	9770		87.0	3070	-	1.180	1
PCB 14	ND	U	97.6	1230	-		1
PCB 11	2490**J**		101	6130	-	0.973	1
PCBs 12 + 13	712**J**		94.2	3070	-	0.984	1
PCB 15	6020		116	1230	-	1.001	1
PCB 19	601000		348	1230	1.03	1.001	1
PCB 18	1950**J**		303	3070	0.91	1.085	1
PCB 30	23400		414	3070	1.03	1.096	1
PCB 17	145000		422	1230	1.04	1.117	1
PCB 27	48000		332	1230	1.06	1.131	1
PCB 24	ND	U	270	1230			1
PCB 16	1740**K**		487	1230	1.41	1.149	1
PCB 32	65900		287	1230	1.06	1.172	1
PCB 34	ND	U	911	1230			1
PCB 23	ND	U	773	1230			1
PCBs 26 + 29	4360		835	3070	0.99	1.261	1
PCB 25	3450		613	1230	1.13	0.833	1
PCB 31	9890		757	3070	1.08	0.845	1
PCBs 20 + 28	443000		804	3070	1.02	0.854	1
PCBs 21 + 33	9070		724	3070	1.13	0.862	1
PCB 22	ND	U	840	1230			1
PCB 36	ND	U	775	1230			1
PCB 39	ND	U	733	1230			1
PCB 38	ND	U	884	1230			1
PCB 35	ND	U	861	1230			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	1080	1230			1
PCB 54	387000		116	1230	0.77	1.001	1
PCBs 50 + 53	244000		454	6130	0.75	0.912	1
PCBs 45 + 51	215000		470	3070	0.77	0.939	1
PCB 46	10500		569	1230	0.79	0.953	1
PCB 52	224000		507	3070	0.77	1.001	1
PCBs 43 + 73	ND	U	406	3070			1
PCB 69	2800**J**		282	6130	0.79	1.013	1
PCB 49	182000		437	6130	0.78	1.019	1
PCB 48	2540**JK**		429	3070	0.58	1.029	1
PCBs 44 + 47 + 65	718000		395	6130	0.77	1.039	1
PCBs 59 + 62 + 75	9990**K**		338	6130	0.60	1.048	1
PCB 42	5630**J**		382	6130	0.74	1.061	1
PCB 41	ND	U	575	6130			1
PCBs 40 + 71	34500		442	6130	0.76	1.081	1
PCB 64	3490		243	3070	0.84	1.089	1
PCB 72	ND	U	340	3070			1
PCB 68	1440**JK**		314	3070	0.63	1.126	1
PCB 57	ND	U	376	3070			1
PCB 58	5780		340	3070	0.74	1.154	1
PCB 67	ND	U	326	3070			1
PCB 63	ND	U	341	3070			1
PCB 61	ND	U	353	12300			1
PCBs 70 + 74 + 76	13800		309	12300	0.73	1.186	1
PCB 66	10500		371	3070	0.80	1.199	1
PCB 55	ND	U	379	3070			1
PCB 56	1970**J**		233	3070	0.68	0.911	1
PCB 60	ND	U	224	3070			1
PCB 80	514**JK**		201	3070	0.60	0.920	1
PCB 79	13100		217	3070	0.77	0.969	1
PCB 78	ND	U	242	3070			1
PCB 81	ND	U	290	1230			1
PCB 77	360**J**		289	1230	0.88	1.000	1
PCB 104	4360		197	1230	1.68	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	14600		242	3070	1.60	1.022	1
PCB 103	20700		290	3070	1.59	1.083	1
PCB 94	12100		329	3070	1.38	1.097	1
PCBs 95 + 100	224000		295	12300	1.53	1.115	1
PCB 93	ND	U	367	12300			1
PCBs 98 + 102	11800**J**		271	12300	1.45	1.126	1
PCB 88	ND	U	348	3070			1
PCB 91	55800		289	3070	1.55	1.146	1
PCB 84	15800		359	1230	1.60	1.159	1
PCB 89	ND	U	922	3070			1
PCB 121	ND	U	385	3070			1
PCB 92	28000		660	3070	1.51	0.983	1
PCBs 90 + 101 + 113	150000		569	12300	1.58	1.001	1
PCBs 83 + 99	41300		649	6130	1.59	1.018	1
PCB 112	549**J**		464	3070	1.64	1.022	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	549000		532	12300	1.55	1.036	1
PCBs 117 + 116	2840**J**		491	6130	1.42	1.053	1
PCB 85	ND	U	680	6130			1
PCBs 110 + 115	59600		402	6130	1.59	1.065	1
PCB 82	ND	U	1440	3070			1
PCB 111	529000		349	3070	1.56	1.080	1
PCB 120	488**JK**		435	3070	1.03	1.093	1
PCBs 108 + 124	ND	U	1170	6130			1
PCB 107	ND	U	1120	3070			1
PCB 123	ND	U	1320	1320			1
PCB 106	ND	U	1260	3070			1
PCB 118	21000		1320	1320	1.68	1.000	1
PCB 122	ND	U	1380	3070			1
PCB 114	ND	U	1370	1370			1
PCB 105	3730		1310	1310	1.61	1.001	1
PCB 127	ND	U	1210	3070			1
PCB 126	ND	U	1340	1340			1
PCB 155	364**JK**		118	1230	2.16	1.001	1
PCB 152	ND	U	143	3070			1
PCB 150	3960		107	3070	1.31	1.018	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	52200		134	3070	1.31	1.037	1
PCB 145	ND	U	119	3070			1
PCB 148	1790**J**		175	3070	1.21	1.082	1
PCB 151	92800		204	6130	1.25	1.105	1
PCBs 135 + 154	23800		144	6130	1.25	1.108	1
PCB 144	11000		172	3070	1.30	1.122	1
PCBs 147 + 149	178000		1420	6130	1.23	0.895	1
PCB 134	5970**J**		1270	6130	1.25	0.902	1
PCB 143	ND	U	1920	6130			1
PCBs 139 + 140	ND	U	1420	6130			1
PCB 131	ND	U	1340	3070			1
PCB 142	ND	U	1830	3070			1
PCB 132	41100		1560	3070	1.16	0.930	1
PCB 133	4070		1670	3070	1.18	0.936	1
PCB 165	ND	U	1160	3070			1
PCB 146	22100		1450	3070	1.16	0.951	1
PCB 161	ND	U	1150	3070			1
PCBs 153 + 168	735000		1200	6130	1.23	0.966	1
PCB 141	31500		1540	3070	1.22	0.974	1
PCB 130	ND	U	1810	3070			1
PCB 137	ND	U	1450	3070			1
PCB 164	8110		1210	3070	1.30	0.994	1
PCBs 129 + 138 + 163	136000		1730	12300	1.19	1.000	1
PCB 160	ND	U	698	12300			1
PCB 158	25700		1070	3070	1.13	1.009	1
PCB 166	ND	U	1200	6130			1
PCB 128	5030**J**		1570	6130	1.06	1.035	1
PCB 159	894**J**		480	3070	1.27	0.985	1
PCB 162	ND	U	456	3070			1
PCB 167	1920**K**		387	1230	0.98	1.001	1
PCBs 156 + 157	4690		792	2450	1.22	0.998	1
PCB 169	ND	U	395	1230			1
PCB 188	ND	U	159	1230			1
PCB 179	20500		131	3070	1.04	1.015	1
PCB 184	ND	U	115	3070			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	4460		134	3070	1.03	1.037	1
PCB 186	ND	U	126	3070			1
PCB 178	555000		185	3070	1.03	1.083	1
PCB 175	1950**JK**		174	3070	1.28	1.099	1
PCB 187	36200		152	3070	1.04	1.107	1
PCB 182	190**J**		172	3070	1.11	1.111	1
PCB 183	16900		528	6130	1.05	1.123	1
PCB 185	3320**J**		513	6130	1.03	1.128	1
PCB 174	32000		569	3070	1.01	1.134	1
PCB 177	17900		599	3070	1.14	1.145	1
PCB 181	ND	U	502	3070			1
PCBs 171 + 173	7530		597	6130	1.15	1.161	1
PCB 172	3760		606	3070	1.10	0.899	1
PCB 192	ND	U	423	3070			1
PCBs 180 + 193	42600		419	6130	1.08	0.912	1
PCB 191	864**JK**		431	3070	0.73	0.919	1
PCB 170	20700		630	3070	1.12	0.940	1
PCB 190	4610		428	3070	1.02	0.949	1
PCB 189	665**JK**		384	1230	1.63	1.001	1
PCB 202	1730**K**		207	1230	0.74	1.001	1
PCB 201	855**JK**		180	3070	1.18	1.021	1
PCB 204	ND	U	186	3070			1
PCB 197	272**JK**		168	6130	1.05	1.042	1
PCB 200	941**J**		187	6130	0.93	1.048	1
PCBs 198 + 199	6610		258	6130	0.88	1.112	1
PCB 196	3720		267	3070	0.91	0.917	1
PCB 203	3040**JK**		224	3070	0.75	0.919	1
PCB 195	2530**JK**		281	3070	1.05	0.948	1
PCB 194	4810		270	3070	0.90	0.991	1
PCB 205	315**JK**		228	1230	1.15	1.001	1
PCB 208	ND	U	190	1230			1
PCB 207	ND	U	217	3070			1
PCB 206	549**JK**		258	1230	1.20	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	244	**JK**	211	1230	1.56	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	3060	**J**	167	3070			1
Total DiCB	356000		73.4	6130			1
Total TriCB	1360000		270	3070			1
Total TetraCB	2090000		116	12300			1
Total PentaCB	1740000		197	12300			1
Total HexaCB	1390000		107	12300			1
Total HeptaCB	770000		115	6130			1
Total OctaCB	24800		168	6130			1
Total NonaCB	549	**J**	190	3070			1
Total PCBs	7730000		73.4	12300			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	Percent
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 14:13
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238757	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1437.417	72		5-145	3.53	0.750
PCB 3L	2000	1388.863	69		5-145	3.57	0.875
PCB 4L	2000	1537.960	77		5-145	1.55	0.891
PCB 15L	2000	1443.675	72		5-145	1.59	1.231
PCB 19L	2000	1646.821	82		5-145	1.08	1.072
PCB 37L	2000	1433.614	72		5-145	1.05	1.090
PCB 54L	2000	1907.477	95		5-145	0.78	0.832
PCB 81L	2000	1321.579	66		10-145	0.79	1.348
PCB 77L	2000	1398.766	70		10-145	0.80	1.373
PCB 104L	2000	1865.496	93		10-145	1.50	0.821
PCB 123L	2000	1377.253	69		10-145	1.59	1.143
PCB 118L	2000	1418.408	71		10-145	1.59	1.154
PCB 114L	2000	1368.995	68		10-145	1.57	1.170
PCB 105L	2000	1458.197	73		10-145	1.64	1.194
PCB 126L	2000	1321.740	66		10-145	1.56	1.289
PCB 155L	2000	2222.302	111		10-145	1.21	0.789
PCB 167L	2000	1738.731	87		10-145	1.26	1.072
PCBs 156L + 157L	4000	3488.675	87		10-145	1.27	1.105
PCB 169L	2000	1859.688	93		10-145	1.25	1.185
PCB 188L	2000	1633.110	82		10-145	1.06	0.718
PCB 189L	2000	1614.896	81		10-145	1.05	0.960
PCB 202L	2000	1613.115	81		10-145	0.92	0.821
PCB 205L	2000	1513.793	76		10-145	0.94	1.009
PCB 208L	2000	1695.567	85		10-145	0.75	0.947
PCB 206L	2000	1631.931	82		10-145	0.80	1.042
PCB 209L	2000	1665.244	83		10-145	1.18	1.070
PCB 28L	2000	1609.767	80		5-145	1.04	0.929
PCB 111L	2000	1543.294	77		10-145	1.61	1.079
PCB 178L	2000	1988.661	99		10-145	1.06	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP004B	**Units:**	ng/Kg
Lab Code:	K1411748-014	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	290	1230	1	0.0003	
PCB 77	**360**	289	1230	1	0.0001	0.0360
PCB 123	ND	1320	1320	1	0.00003	
PCB 118	**21000**	1320	1320	1	0.00003	0.630
PCB 114	ND	1370	1370	1	0.00003	
PCB 105	**3730**	1310	1310	1	0.00003	0.112
PCB 126	ND	1340	1340	1	0.1	
PCB 167	**1920**	387	1230	1	0.00003	0.0576
PCBs 156 + 157	**4690**	792	2450	1	0.00003	0.141
PCB 169	ND	395	1230	1	0.03	
PCB 189	**665**	384	1230	1	0.00003	0.0200
	Total TEQ					0.997

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	4460	17400			1
PCB 2	ND	U	6620	17400			1
PCB 3	ND	U	6800	17400			1
PCB 4	ND	U	2250	17400	-		1
PCB 10	ND	U	1860	43500	-		1
PCB 9	ND	U	2880	17400	-		1
PCB 7	ND	U	2300	17400	-		1
PCB 6	ND	U	2600	17400	-		1
PCB 5	ND	U	2560	17400	-		1
PCB 8	ND	U	2290	43500	-		1
PCB 14	ND	U	2620	17400	-		1
PCB 11	ND	U	2910	87000	-		1
PCBs 12 + 13	ND	U	2660	43500	-		1
PCB 15	ND	U	3500	17400	-		1
PCB 19	ND	U	11200	17400			1
PCB 18	ND	U	9890	43500			1
PCB 30	ND	U	14100	43500			1
PCB 17	ND	U	14600	17400			1
PCB 27	ND	U	10400	17400			1
PCB 24	ND	U	9520	17400			1
PCB 16	ND	U	16700	17400			1
PCB 32	ND	U	9650	17400			1
PCB 34	ND	U	12500	17400			1
PCB 23	ND	U	10100	17400			1
PCBs 26 + 29	ND	U	10700	43500			1
PCB 25	ND	U	8370	17400			1
PCB 31	ND	U	10600	43500			1
PCBs 20 + 28	849000		11700	43500	1.02	0.854	1
PCBs 21 + 33	ND	U	9290	43500			1
PCB 22	ND	U	11000	17400			1
PCB 36	ND	U	10200	17400			1
PCB 39	ND	U	9330	17400			1
PCB 38	ND	U	11400	17400			1
PCB 35	ND	U	12300	17400			1
PCB 37	ND	U	16500	17400			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	39700		5730	17400	0.88	1.001	1
PCBs 50 + 53	ND	U	7690	87000			1
PCBs 45 + 51	9910**JK**		7540	43500	0.95	0.939	1
PCB 46	ND	U	9070	17400			1
PCB 52	ND	U	7900	43500			1
PCBs 43 + 73	ND	U	6920	43500			1
PCB 69	ND	U	4640	87000			1
PCB 49	25100**J**		6710	87000	0.76	1.019	1
PCB 48	ND	U	6970	43500			1
PCBs 44 + 47 + 65	3130000		6590	87000	0.79	1.039	1
PCBs 59 + 62 + 75	ND	U	8180	87000			1
PCB 42	ND	U	6260	87000			1
PCB 41	ND	U	9540	87000			1
PCBs 40 + 71	ND	U	7460	87000			1
PCB 64	ND	U	3950	43500			1
PCB 72	ND	U	5880	43500			1
PCB 68	ND	U	5490	43500			1
PCB 57	ND	U	6420	43500			1
PCB 58	ND	U	6130	43500			1
PCB 67	ND	U	5450	43500			1
PCB 63	ND	U	6160	43500			1
PCB 61	ND	U	6150	174000			1
PCBs 70 + 74 + 76	ND	U	5350	174000			1
PCB 66	ND	U	6580	43500			1
PCB 55	ND	U	6840	43500			1
PCB 56	ND	U	7020	43500			1
PCB 60	ND	U	6290	43500			1
PCB 80	ND	U	5690	43500			1
PCB 79	179000		6110	43500	0.79	0.969	1
PCB 78	ND	U	7360	43500			1
PCB 81	ND	U	8020	17400			1
PCB 77	ND	U	8210	17400			1
PCB 104	ND	U	6860	17400			1
PCB 96	ND	U	7360	43500			1
PCB 103	ND	U	8720	43500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	10000	43500			1
PCBs 95 + 100	20300**J**		9040	174000	1.62	1.116	1
PCB 93	ND	U	10600	174000			1
PCBs 98 + 102	ND	U	8670	174000			1
PCB 88	ND	U	10600	43500			1
PCB 91	ND	U	8530	43500			1
PCB 84	ND	U	12000	17400			1
PCB 89	ND	U	16000	43500			1
PCB 121	ND	U	7360	43500			1
PCB 92	ND	U	12500	43500			1
PCBs 90 + 101 + 113	ND	U	10500	174000			1
PCBs 83 + 99	ND	U	12200	87000			1
PCB 112	ND	U	8750	43500			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	6660000		10200	174000	1.54	1.036	1
PCBs 117 + 116	ND	U	9120	87000			1
PCB 85	ND	U	12300	87000			1
PCBs 110 + 115	ND	U	7420	87000			1
PCB 82	ND	U	19000	43500			1
PCB 111	9950000		7840	43500	1.54	1.080	1
PCB 120	ND	U	8710	43500			1
PCBs 108 + 124	ND	U	15900	87000			1
PCB 107	ND	U	17300	43500			1
PCB 123	ND	U	18100	18100			1
PCB 106	ND	U	16400	43500			1
PCB 118	ND	U	18300	18300			1
PCB 122	ND	U	18600	43500			1
PCB 114	ND	U	18400	18400			1
PCB 105	ND	U	17800	17800			1
PCB 127	ND	U	20000	43500			1
PCB 126	ND	U	18700	18700			1
PCB 155	ND	U	4820	17400			1
PCB 152	ND	U	5820	43500			1
PCB 150	ND	U	5270	43500			1
PCB 136	ND	U	5790	43500			1
PCB 145	ND	U	5080	43500			1
PCB 148	ND	U	8090	43500			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	23100**JK**		8850	87000	2.01	1.105	1
PCBs 135 + 154	9290**JK**		6920	87000	0.97	1.107	1
PCB 144	ND	U	7860	43500			1
PCBs 147 + 149	31400**J**		7780	87000	1.34	0.896	1
PCB 134	ND	U	7230	87000			1
PCB 143	ND	U	9490	87000			1
PCBs 139 + 140	ND	U	7830	87000			1
PCB 131	ND	U	7720	43500			1
PCB 142	ND	U	9850	43500			1
PCB 132	ND	U	8990	43500			1
PCB 133	ND	U	9610	43500			1
PCB 165	ND	U	6470	43500			1
PCB 146	ND	U	7400	43500			1
PCB 161	ND	U	6790	43500			1
PCBs 153 + 168	9070000		6830	87000	1.26	0.966	1
PCB 141	14300**JK**		8680	43500	0.63	0.974	1
PCB 130	ND	U	10100	43500			1
PCB 137	ND	U	8160	43500			1
PCB 164	ND	U	6570	43500			1
PCBs 129 + 138 + 163	42600**JK**		9700	174000	0.93	1.000	1
PCB 160	ND	U	3980	174000			1
PCB 158	253000		6130	43500	1.07	1.009	1
PCB 166	ND	U	6520	87000			1
PCB 128	ND	U	8880	87000			1
PCB 159	ND	U	12100	43500			1
PCB 162	ND	U	11400	43500			1
PCB 167	ND	U	9700	17400			1
PCBs 156 + 157	ND	U	19700	34800			1
PCB 169	ND	U	11100	17400			1
PCB 188	ND	U	6850	17400			1
PCB 179	ND	U	5870	43500			1
PCB 184	ND	U	5300	43500			1
PCB 176	ND	U	5820	43500			1
PCB 186	ND	U	5620	43500			1
PCB 178	6970000		8520	43500	1.02	1.083	1
PCB 175	ND	U	8070	43500			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	6820	43500			1
PCB 182	ND	U	7410	43500			1
PCB 183	ND	U	13100	87000			1
PCB 185	ND	U	12800	87000			1
PCB 174	ND	U	12800	43500			1
PCB 177	ND	U	14000	43500			1
PCB 181	ND	U	12000	43500			1
PCBs 171 + 173	ND	U	15000	87000			1
PCB 172	ND	U	14700	43500			1
PCB 192	ND	U	10700	43500			1
PCBs 180 + 193	14100**J**		10500	87000	1.14	0.912	1
PCB 191	ND	U	11200	43500			1
PCB 170	ND	U	15800	43500			1
PCB 190	ND	U	9760	43500			1
PCB 189	ND	U	10400	17400			1
PCB 202	ND	U	6980	17400			1
PCB 201	ND	U	6520	43500			1
PCB 204	ND	U	6550	43500			1
PCB 197	ND	U	6130	87000			1
PCB 200	ND	U	6690	87000			1
PCBs 198 + 199	ND	U	9090	87000			1
PCB 196	ND	U	9510	43500			1
PCB 203	ND	U	8140	43500			1
PCB 195	ND	U	9700	43500			1
PCB 194	ND	U	9730	43500			1
PCB 205	ND	U	8170	17400			1
PCB 208	ND	U	7340	17400			1
PCB 207	ND	U	8500	43500			1
PCB 206	ND	U	11900	17400			1
PCB 209	ND	U	7400	17400			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	4460	43500			1
Total DiCB	ND	U	1860	87000			1
Total TriCB	849000		8370	43500			1
Total TetraCB	3390000		3950	174000			1
Total PentaCB	16600000		6860	174000			1
Total HexaCB	9440000		3980	174000			1
Total HeptaCB	6990000		5300	87000			1
Total OctaCB	ND	U	6130	87000			1
Total NonaCB	ND	U	7340	43500			1
Total PCBs	37300000		1860	174000			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	Percent
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 19:47
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.150mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238858	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1478.672	74		5-145	3.01	0.750
PCB 3L	2000	1437.358	72		5-145	3.35	0.877
PCB 4L	2000	1566.749	78		5-145	1.50	0.891
PCB 15L	2000	1362.003	68		5-145	1.60	1.232
PCB 19L	2000	1602.655	80		5-145	1.04	1.071
PCB 37L	2000	1224.024	61		5-145	0.96	1.090
PCB 54L	2000	1948.727	97		5-145	0.79	0.831
PCB 81L	2000	1381.526	69		10-145	0.76	1.347
PCB 77L	2000	1465.527	73		10-145	0.75	1.372
PCB 104L	2000	1817.598	91		10-145	1.55	0.820
PCB 123L	2000	1337.857	67		10-145	1.49	1.143
PCB 118L	2000	1361.369	68		10-145	1.56	1.153
PCB 114L	2000	1318.539	66		10-145	1.59	1.170
PCB 105L	2000	1448.864	72		10-145	1.50	1.194
PCB 126L	2000	1353.946	68		10-145	1.53	1.290
PCB 155L	2000	2078.333	104		10-145	1.20	0.790
PCB 167L	2000	1595.578	80		10-145	1.26	1.073
PCBs 156L + 157L	4000	3189.059	80		10-145	1.32	1.106
PCB 169L	2000	1649.971	82		10-145	1.27	1.186
PCB 188L	2000	1564.899	78		10-145	1.05	0.718
PCB 189L	2000	1486.689	74		10-145	1.07	0.961
PCB 202L	2000	1545.651	77		10-145	0.95	0.821
PCB 205L	2000	1512.149	76		10-145	0.83	1.009
PCB 208L	2000	1864.301	93		10-145	0.80	0.947
PCB 206L	2000	1505.119	75		10-145	0.81	1.042
PCB 209L	2000	1647.505	82		10-145	1.19	1.071
PCB 28L	2000	1521.921	76		5-145	0.97	0.929
PCB 111L	2000	1651.556	83		10-145	1.62	1.079
PCB 178L	2000	1869.680	93		10-145	1.06	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW003A	**Units:**	ng/Kg
Lab Code:	K1411748-017	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	8020	17400	1	0.0003	
PCB 77	ND	8210	17400	1	0.0001	
PCB 123	ND	18100	18100	1	0.00003	
PCB 118	ND	18300	18300	1	0.00003	
PCB 114	ND	18400	18400	1	0.00003	
PCB 105	ND	17800	17800	1	0.00003	
PCB 126	ND	18700	18700	1	0.1	
PCB 167	ND	9700	17400	1	0.00003	
PCBs 156 + 157	ND	19700	34800	1	0.00003	
PCB 169	ND	11100	17400	1	0.03	
PCB 189	ND	10400	17400	1	0.00003	
	Total TEQ					0.00

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	3420	10300			1
PCB 2	ND	U	5040	10300			1
PCB 3	ND	U	5160	10300			1
PCB 4	38300		2050	10300	-	1.001	1
PCB 10	ND	U	1590	25800	-		1
PCB 9	ND	U	2050	10300	-		1
PCB 7	ND	U	1640	10300	-		1
PCB 6	ND	U	1850	10300	-		1
PCB 5	ND	U	1820	10300	-		1
PCB 8	9610**J**		1630	25800	-	1.181	1
PCB 14	ND	U	1860	10300	-		1
PCB 11	5760**J**		2070	51500	-	0.971	1
PCBs 12 + 13	ND	U	1890	25800	-		1
PCB 15	32900		2380	10300	-	1.001	1
PCB 19	97400		5760	10300	1.00	1.001	1
PCB 18	15600**JK**		5060	25800	0.70	1.086	1
PCB 30	21400**JK**		7200	25800	1.34	1.098	1
PCB 17	43300		7440	10300	1.00	1.119	1
PCB 27	10100**J**		5290	10300	1.11	1.133	1
PCB 24	ND	U	4880	10300			1
PCB 16	10000**JK**		8510	10300	0.73	1.151	1
PCB 32	ND	U	4940	10300	1.06	1.170	1
PCB 34	ND	U	63000	63000			1
PCB 23	ND	U	51000	51000			1
PCBs 26 + 29	ND	U	54000	54000			1
PCB 25	ND	U	42300	42300			1
PCB 31	ND	U	53100	53100			1
PCBs 20 + 28	11600000		58700	58700	1.03	0.853	1
PCBs 21 + 33	ND	U	46900	46900			1
PCB 22	ND	U	55300	55300			1
PCB 36	ND	U	51100	51100			1
PCB 39	ND	U	47100	47100			1
PCB 38	ND	U	57300	57300			1
PCB 35	ND	U	61800	61800			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	82200	82200			1
PCB 54	6810000		4250	10300	0.75	1.001	1
PCBs 50 + 53	211000		6000	51500	0.76	0.912	1
PCBs 45 + 51	253000		5880	25800	0.83	0.939	1
PCB 46	ND	U	7070	10300			1
PCB 52	275000		6150	25800	0.69	1.001	1
PCBs 43 + 73	ND	U	5390	25800			1
PCB 69	ND	U	3620	51500			1
PCB 49	317000		5230	51500	0.71	1.019	1
PCB 48	ND	U	5430	25800			1
PCBs 44 + 47 + 65	11000000		5130	51500	0.78	1.039	1
PCBs 59 + 62 + 75	112000**K**		6370	51500	1.65	1.046	1
PCB 42	ND	U	4880	51500			1
PCB 41	ND	U	7440	51500			1
PCBs 40 + 71	60200**K**		5810	51500	0.60	1.080	1
PCB 64	ND	U	3080	25800			1
PCB 72	ND	U	4580	25800			1
PCB 68	ND	U	4280	25800			1
PCB 57	ND	U	5000	25800			1
PCB 58	ND	U	4780	25800			1
PCB 67	ND	U	4250	25800			1
PCB 63	ND	U	4800	25800			1
PCB 61	ND	U	4790	103000			1
PCBs 70 + 74 + 76	43800**JK**		4170	103000	1.05	1.186	1
PCB 66	32100		5130	25800	0.86	1.198	1
PCB 55	ND	U	5330	25800			1
PCB 56	33600**K**		4750	25800	1.42	0.911	1
PCB 60	ND	U	4250	25800			1
PCB 80	ND	U	3850	25800			1
PCB 79	350000		4130	25800	0.83	0.969	1
PCB 78	ND	U	4980	25800			1
PCB 81	ND	U	5660	10300			1
PCB 77	ND	U	5390	10300			1
PCB 104	8600**JK**		4920	10300	3.11	1.001	1
PCB 96	26600		4970	25800	1.36	1.023	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	31600**K**		5880	25800	1.30	1.084	1
PCB 94	30600		6750	25800	1.39	1.096	1
PCBs 95 + 100	239000		6100	103000	1.61	1.116	1
PCB 93	ND	U	7100	103000			1
PCBs 98 + 102	16600**JK**		5860	103000	1.26	1.127	1
PCB 88	ND	U	7160	25800			1
PCB 91	91700		5760	25800	1.68	1.146	1
PCB 84	32100**K**		8080	10300	1.84	1.159	1
PCB 89	ND	U	11300	25800			1
PCB 121	ND	U	5200	25800			1
PCB 92	54000		8820	25800	1.64	0.983	1
PCBs 90 + 101 + 113	205000		7370	103000	1.55	1.001	1
PCBs 83 + 99	91400		8600	51500	1.39	1.018	1
PCB 112	ND	U	6180	25800			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	12500000		7150	103000	1.52	1.036	1
PCBs 117 + 116	ND	U	6440	51500			1
PCB 85	ND	U	8630	51500			1
PCBs 110 + 115	72200		5240	51500	1.41	1.066	1
PCB 82	ND	U	13400	25800			1
PCB 111	14500000		5530	25800	1.56	1.080	1
PCB 120	ND	U	6150	25800			1
PCBs 108 + 124	ND	U	15300	51500			1
PCB 107	ND	U	16600	25800			1
PCB 123	ND	U	16900	16900			1
PCB 106	ND	U	15700	25800			1
PCB 118	39800**K**		18100	18100	1.25	1.001	1
PCB 122	ND	U	17800	25800			1
PCB 114	ND	U	16300	16300			1
PCB 105	ND	U	17100	17100			1
PCB 127	ND	U	19200	25800			1
PCB 126	ND	U	17600	17600			1
PCB 155	ND	U	3940	10300			1
PCB 152	ND	U	4850	25800			1
PCB 150	8230**J**		4390	25800	1.11	1.018	1
PCB 136	66100		4820	25800	1.40	1.036	1
PCB 145	ND	U	4230	25800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	ND	U	6740	25800			1
PCB 151	116000**K**		7370	51500	1.51	1.105	1
PCBs 135 + 154	73200**K**		5760	51500	0.87	1.107	1
PCB 144	11500**JK**		6540	25800	1.51	1.122	1
PCBs 147 + 149	247000		5200	51500	1.26	0.895	1
PCB 134	ND	U	4830	51500			1
PCB 143	ND	U	6340	51500			1
PCBs 139 + 140	ND	U	5230	51500			1
PCB 131	ND	U	5160	25800			1
PCB 142	ND	U	6580	25800			1
PCB 132	46800**K**		6010	25800	0.86	0.930	1
PCB 133	ND	U	6420	25800			1
PCB 165	ND	U	4330	25800			1
PCB 146	52700		4940	25800	1.17	0.951	1
PCB 161	ND	U	4530	25800			1
PCBs 153 + 168	13600000		4560	51500	1.25	0.966	1
PCB 141	87700**K**		5800	25800	0.96	0.974	1
PCB 130	ND	U	6720	25800			1
PCB 137	ND	U	5450	25800			1
PCB 164	ND	U	4390	25800			1
PCBs 129 + 138 + 163	199000		6480	103000	1.13	1.000	1
PCB 160	ND	U	2660	103000			1
PCB 158	392000		4100	25800	1.15	1.009	1
PCB 166	ND	U	4360	51500			1
PCB 128	ND	U	5930	51500			1
PCB 159	ND	U	4880	25800			1
PCB 162	ND	U	4610	25800			1
PCB 167	ND	U	3970	10300			1
PCBs 156 + 157	ND	U	8180	20600			1
PCB 169	ND	U	4250	10300			1
PCB 188	ND	U	3330	10300			1
PCB 179	43200**K**		2950	25800	0.86	1.015	1
PCB 184	ND	U	2670	25800			1
PCB 176	ND	U	2930	25800			1
PCB 186	ND	U	2820	25800			1
PCB 178	10100000		4280	25800	1.04	1.083	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 175	ND	U	4060	25800			1
PCB 187	90200		3430	25800	1.05	1.107	1
PCB 182	ND	U	3730	25800			1
PCB 183	39700**J**		8170	51500	0.95	1.123	1
PCB 185	11900**JK**		8040	51500	1.59	1.128	1
PCB 174	48800		8020	25800	1.01	1.133	1
PCB 177	47500**K**		8740	25800	1.31	1.145	1
PCB 181	ND	U	7520	25800			1
PCBs 171 + 173	16900**JK**		9410	51500	1.62	1.161	1
PCB 172	ND	U	9170	25800			1
PCB 192	ND	U	6670	25800			1
PCBs 180 + 193	95400**K**		6570	51500	1.24	0.912	1
PCB 191	ND	U	7020	25800			1
PCB 170	53400		9910	25800	1.06	0.940	1
PCB 190	ND	U	6130	25800			1
PCB 189	ND	U	6720	10300			1
PCB 202	ND	U	3220	10300			1
PCB 201	ND	U	2970	25800			1
PCB 204	ND	U	2980	25800			1
PCB 197	ND	U	2790	51500			1
PCB 200	ND	U	3040	51500			1
PCBs 198 + 199	24800**JK**		4130	51500	1.31	1.112	1
PCB 196	ND	U	4320	25800			1
PCB 203	11800**JK**		3700	25800	1.24	0.919	1
PCB 195	ND	U	4410	25800			1
PCB 194	12900**JK**		4430	25800	1.97	0.992	1
PCB 205	ND	U	3660	10300			1
PCB 208	ND	U	3340	10300			1
PCB 207	ND	U	3760	25800			1
PCB 206	ND	U	10200	10300			1
PCB 209	ND	U	7300	10300			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	3420	25800			1
Total DiCB	86500		1590	51500			1
Total TriCB	11800000		4880	25800			1
Total TetraCB	19500000		3080	103000			1
Total PentaCB	28000000		4920	103000			1
Total HexaCB	14900000		2660	103000			1
Total HeptaCB	10500000		2670	51500			1
Total OctaCB	49500**J**		2790	51500			1
Total NonaCB	ND	U	3340	25800			1
Total PCBs	84900000		1590	103000			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	Percent
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 20:51
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238859	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1390.169	70		5-145	3.29	0.750
PCB 3L	2000	1349.311	67		5-145	3.31	0.878
PCB 4L	2000	1470.939	74		5-145	1.59	0.892
PCB 15L	2000	1316.352	66		5-145	1.50	1.235
PCB 19L	2000	1477.981	74		5-145	1.03	1.072
PCB 37L	2000	1204.582	60		5-145	0.96	1.090
PCB 54L	2000	1765.346	88		5-145	0.80	0.831
PCB 81L	2000	1243.748	62		10-145	0.77	1.348
PCB 77L	2000	1319.769	66		10-145	0.80	1.373
PCB 104L	2000	1607.263	80		10-145	1.62	0.820
PCB 123L	2000	1274.108	64		10-145	1.59	1.144
PCB 118L	2000	1299.128	65		10-145	1.57	1.154
PCB 114L	2000	1397.834	70		10-145	1.66	1.171
PCB 105L	2000	1368.075	68		10-145	1.67	1.195
PCB 126L	2000	1267.840	63		10-145	1.58	1.290
PCB 155L	2000	1970.850	99		10-145	1.29	0.789
PCB 167L	2000	1498.678	75		10-145	1.36	1.073
PCBs 156L + 157L	4000	2954.422	74		10-145	1.25	1.106
PCB 169L	2000	1612.776	81		10-145	1.32	1.185
PCB 188L	2000	1383.183	69		10-145	1.03	0.718
PCB 189L	2000	1385.344	69		10-145	0.96	0.960
PCB 202L	2000	1378.559	69		10-145	0.92	0.821
PCB 205L	2000	1384.891	69		10-145	1.01	1.009
PCB 208L	2000	1607.723	80		10-145	0.82	0.947
PCB 206L	2000	1406.131	70		10-145	0.79	1.042
PCB 209L	2000	1469.792	73		10-145	1.23	1.070
PCB 28L	2000	1484.324	74		5-145	0.97	0.930
PCB 111L	2000	1524.002	76		10-145	1.42	1.079
PCB 178L	2000	1805.635	90		10-145	1.08	1.008

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP003A	**Units:**	ng/Kg
Lab Code:	K1411748-018	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	5660	10300	1	0.0003	
PCB 77	ND	5390	10300	1	0.0001	
PCB 123	ND	16900	16900	1	0.00003	
PCB 118	**39800**	18100	18100	1	0.00003	1.19
PCB 114	ND	16300	16300	1	0.00003	
PCB 105	ND	17100	17100	1	0.00003	
PCB 126	ND	17600	17600	1	0.1	
PCB 167	ND	3970	10300	1	0.00003	
PCBs 156 + 157	ND	8180	20600	1	0.00003	
PCB 169	ND	4250	10300	1	0.03	
PCB 189	ND	6720	10300	1	0.00003	
	Total TEQ					1.19

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	331	2380			1
PCB 2	ND	U	414	2380			1
PCB 3	ND	U	428	2380			1
PCB 4	1480**J**		185	2380	-	1.001	1
PCB 10	ND	U	147	5950	-		1
PCB 9	ND	U	162	2380	-		1
PCB 7	ND	U	137	2380	-		1
PCB 6	ND	U	151	2380	-		1
PCB 5	ND	U	162	2380	-		1
PCB 8	ND	U	138	5950	-		1
PCB 14	ND	U	155	2380	-		1
PCB 11	914**J**		160	11900	-	0.970	1
PCBs 12 + 13	ND	U	150	5950	-		1
PCB 15	ND	U	184	2380	-		1
PCB 19	5370**K**		504	2380	1.22	1.001	1
PCB 18	ND	U	456	5950			1
PCB 30	827**J**		621	5950	1.15	1.097	1
PCB 17	2250**J**		633	2380	1.15	1.118	1
PCB 27	767**J**		499	2380	1.00	1.131	1
PCB 24	ND	U	405	2380			1
PCB 16	ND	U	731	2380			1
PCB 32	1400**JK**		430	2380	1.33	1.172	1
PCB 34	ND	U	764	2380			1
PCB 23	ND	U	648	2380			1
PCBs 26 + 29	ND	U	700	5950			1
PCB 25	ND	U	514	2380			1
PCB 31	791**J**		635	5950	0.89	0.845	1
PCBs 20 + 28	26800		674	5950	1.04	0.855	1
PCBs 21 + 33	ND	U	607	5950			1
PCB 22	ND	U	704	2380			1
PCB 36	ND	U	650	2380			1
PCB 39	ND	U	614	2380			1
PCB 38	ND	U	741	2380			1
PCB 35	ND	U	722	2380			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	922	2380			1
PCB 54	8920		244	2380	0.75	1.001	1
PCBs 50 + 53	12200		490	11900	0.71	0.912	1
PCBs 45 + 51	15100		507	5950	0.72	0.939	1
PCB 46	ND	U	614	2380			1
PCB 52	21300		548	5950	0.78	1.001	1
PCBs 43 + 73	ND	U	438	5950			1
PCB 69	ND	U	304	11900			1
PCB 49	22300		472	11900	0.78	1.018	1
PCB 48	ND	U	463	5950			1
PCBs 44 + 47 + 65	145000		426	11900	0.78	1.039	1
PCBs 59 + 62 + 75	2210**J**		365	11900	0.80	1.048	1
PCB 42	663**JK**		413	11900	0.52	1.061	1
PCB 41	ND	U	620	11900			1
PCBs 40 + 71	4050**J**		477	11900	0.79	1.080	1
PCB 64	733**JK**		262	5950	0.38	1.088	1
PCB 72	ND	U	367	5950			1
PCB 68	464**J**		338	5950	0.78	1.125	1
PCB 57	ND	U	406	5950			1
PCB 58	1040**JK**		366	5950	0.54	1.154	1
PCB 67	ND	U	352	5950			1
PCB 63	ND	U	368	5950			1
PCB 61	ND	U	380	23800			1
PCBs 70 + 74 + 76	3730**J**		333	23800	0.85	1.185	1
PCB 66	2810**J**		401	5950	0.68	1.198	1
PCB 55	ND	U	408	5950			1
PCB 56	795**JK**		417	5950	1.01	0.911	1
PCB 60	ND	U	401	5950			1
PCB 80	ND	U	360	5950			1
PCB 79	6560		390	5950	0.65	0.969	1
PCB 78	ND	U	434	5950			1
PCB 81	ND	U	520	2380			1
PCB 77	ND	U	510	2380			1
PCB 104	945**JK**		466	2380	1.01	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	1820**JK**		551	5950	2.44	1.022	1
PCB 103	4190**J**		660	5950	1.49	1.083	1
PCB 94	2180**J**		751	5950	1.49	1.097	1
PCBs 95 + 100	40000		673	23800	1.62	1.115	1
PCB 93	ND	U	837	23800			1
PCBs 98 + 102	2110**JK**		618	23800	2.54	1.126	1
PCB 88	ND	U	793	5950			1
PCB 91	11000		658	5950	1.35	1.146	1
PCB 84	3350**K**		817	2380	1.10	1.159	1
PCB 89	ND	U	1380	5950			1
PCB 121	ND	U	575	5950			1
PCB 92	7330		985	5950	1.32	0.984	1
PCBs 90 + 101 + 113	41900		849	23800	1.53	1.001	1
PCBs 83 + 99	10500**J**		968	11900	1.67	1.018	1
PCB 112	ND	U	692	5950			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	309000		793	23800	1.58	1.037	1
PCBs 117 + 116	ND	U	733	11900			1
PCB 85	ND	U	1020	11900			1
PCBs 110 + 115	14600		599	11900	1.46	1.065	1
PCB 82	ND	U	2150	5950			1
PCB 111	524000		520	5950	1.56	1.080	1
PCB 120	ND	U	648	5950			1
PCBs 108 + 124	ND	U	1170	11900			1
PCB 107	ND	U	1110	5950			1
PCB 123	ND	U	1330	2380			1
PCB 106	ND	U	1260	5950			1
PCB 118	9040		1310	2380	1.69	1.001	1
PCB 122	ND	U	1370	5950			1
PCB 114	ND	U	1320	2380			1
PCB 105	1870**J**		1270	2380	1.69	1.001	1
PCB 127	ND	U	1210	5950			1
PCB 126	ND	U	1290	2380			1
PCB 155	ND	U	337	2380			1
PCB 152	ND	U	405	5950			1
PCB 150	667**J**		304	5950	1.15	1.018	1
PCB 136	13200		380	5950	1.25	1.036	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 145	ND	U	337	5950			1
PCB 148	ND	U	496	5950			1
PCB 151	31700		579	11900	1.26	1.105	1
PCBs 135 + 154	7690**JK**		407	11900	1.44	1.108	1
PCB 144	4160**J**		486	5950	1.13	1.121	1
PCBs 147 + 149	58800		820	11900	1.21	0.895	1
PCB 134	ND	U	734	11900			1
PCB 143	ND	U	1110	11900			1
PCBs 139 + 140	ND	U	817	11900			1
PCB 131	ND	U	770	5950			1
PCB 142	ND	U	1060	5950			1
PCB 132	13800		901	5950	1.22	0.930	1
PCB 133	ND	U	962	5950			1
PCB 165	ND	U	666	5950			1
PCB 146	9170		836	5950	1.10	0.951	1
PCB 161	ND	U	662	5950			1
PCBs 153 + 168	797000		689	11900	1.22	0.966	1
PCB 141	13500		886	5950	1.13	0.974	1
PCB 130	ND	U	1050	5950			1
PCB 137	ND	U	836	5950			1
PCB 164	3130**J**		695	5950	1.36	0.994	1
PCBs 129 + 138 + 163	58700		995	23800	1.34	1.000	1
PCB 160	ND	U	404	23800			1
PCB 158	27300		619	5950	1.34	1.008	1
PCB 166	ND	U	689	11900			1
PCB 128	2030**JK**		907	11900	0.80	1.035	1
PCB 159	ND	U	578	5950			1
PCB 162	ND	U	550	5950			1
PCB 167	1170**J**		466	2380	1.05	1.000	1
PCBs 156 + 157	2650**J**		946	4760	1.40	1.001	1
PCB 169	ND	U	481	2380			1
PCB 188	ND	U	342	2380			1
PCB 179	8620		282	5950	1.18	1.015	1
PCB 184	ND	U	249	5950			1
PCB 176	ND	U	290	5950			1
PCB 186	ND	U	272	5950			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 178	796000		400	5950	1.06	1.083	1
PCB 175	1380**JK**		377	5950	0.86	1.099	1
PCB 187	19200		329	5950	1.00	1.107	1
PCB 182	ND	U	372	5950			1
PCB 183	9790**J**		789	11900	1.20	1.122	1
PCB 185	1830**J**		766	11900	0.94	1.128	1
PCB 174	16400		849	5950	0.92	1.133	1
PCB 177	10300		894	5950	0.97	1.145	1
PCB 181	ND	U	749	5950			1
PCBs 171 + 173	3430**J**		891	11900	1.16	1.160	1
PCB 172	2080**JK**		904	5950	0.81	0.899	1
PCB 192	ND	U	631	5950			1
PCBs 180 + 193	24600		626	11900	1.06	0.912	1
PCB 191	ND	U	644	5950			1
PCB 170	11000		941	5950	0.94	0.939	1
PCB 190	2930**J**		639	5950	0.92	0.949	1
PCB 189	ND	U	574	2380			1
PCB 202	913**JK**		368	2380	1.07	1.000	1
PCB 201	581**J**		325	5950	0.85	1.021	1
PCB 204	ND	U	336	5950			1
PCB 197	ND	U	304	11900			1
PCB 200	394**JK**		338	11900	1.45	1.049	1
PCBs 198 + 199	3890**J**		467	11900	1.00	1.112	1
PCB 196	1840**J**		482	5950	0.94	0.917	1
PCB 203	2170**J**		404	5950	1.00	0.920	1
PCB 195	1960**JK**		507	5950	1.46	0.948	1
PCB 194	3000**JK**		489	5950	1.06	0.991	1
PCB 205	ND	U	420	2380			1
PCB 208	ND	U	353	2380			1
PCB 207	ND	U	385	5950			1
PCB 206	ND	U	556	2380			1
PCB 209	734**JK**		393	2380	1.61	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	331	5950			1
Total DiCB	2400**J**		137	11900			1
Total TriCB	38200		405	5950			1
Total TetraCB	248000		244	23800			1
Total PentaCB	985000		466	23800			1
Total HexaCB	1040000		304	23800			1
Total HeptaCB	908000		249	11900			1
Total OctaCB	14700		304	11900			1
Total NonaCB	ND	U	353	5950			1
Total PCBs	3240000		137	23800			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	Percent
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 15:18
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	8.400mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238758	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1433.296	72		5-145	3.32	0.750
PCB 3L	2000	1409.618	70		5-145	3.41	0.876
PCB 4L	2000	1508.018	75		5-145	1.56	0.891
PCB 15L	2000	1430.958	72		5-145	1.55	1.232
PCB 19L	2000	1591.515	80		5-145	1.02	1.072
PCB 37L	2000	1391.784	70		5-145	0.99	1.089
PCB 54L	2000	1851.095	93		5-145	0.79	0.831
PCB 81L	2000	1349.362	67		10-145	0.78	1.348
PCB 77L	2000	1428.160	71		10-145	0.77	1.373
PCB 104L	2000	1888.850	94		10-145	1.54	0.821
PCB 123L	2000	1419.883	71		10-145	1.62	1.144
PCB 118L	2000	1438.375	72		10-145	1.62	1.154
PCB 114L	2000	1413.485	71		10-145	1.64	1.171
PCB 105L	2000	1509.149	75		10-145	1.57	1.195
PCB 126L	2000	1393.165	70		10-145	1.65	1.289
PCB 155L	2000	2147.122	107		10-145	1.24	0.789
PCB 167L	2000	1662.252	83		10-145	1.25	1.073
PCBs 156L + 157L	4000	3381.263	85		10-145	1.25	1.102
PCB 169L	2000	1792.877	90		10-145	1.27	1.185
PCB 188L	2000	1563.308	78		10-145	1.06	0.718
PCB 189L	2000	1616.020	81		10-145	1.00	0.960
PCB 202L	2000	1600.737	80		10-145	0.87	0.821
PCB 205L	2000	1500.926	75		10-145	0.92	1.009
PCB 208L	2000	1612.243	81		10-145	0.80	0.947
PCB 206L	2000	1651.033	83		10-145	0.79	1.042
PCB 209L	2000	1673.910	84		10-145	1.19	1.070
PCB 28L	2000	1531.799	77		5-145	1.02	0.929
PCB 111L	2000	1563.660	78		10-145	1.54	1.080
PCB 178L	2000	1870.951	94		10-145	1.04	1.008

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW002A	**Units:**	ng/Kg
Lab Code:	K1411748-023	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	520	2380	1	0.0003	
PCB 77	ND	510	2380	1	0.0001	
PCB 123	ND	1330	2380	1	0.00003	
PCB 118	**9040**	1310	2380	1	0.00003	0.271
PCB 114	ND	1320	2380	1	0.00003	
PCB 105	**1870**	1270	2380	1	0.00003	0.0561
PCB 126	ND	1290	2380	1	0.1	
PCB 167	**1170**	466	2380	1	0.00003	0.0351
PCBs 156 + 157	**2650**	946	4760	1	0.00003	0.0795
PCB 169	ND	481	2380	1	0.03	
PCB 189	ND	574	2380	1	0.00003	
	Total TEQ					0.442

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	425**J**		131	1230	3.50	1.000	1
PCB 2	ND	U	162	1230			1
PCB 3	ND	U	166	1230			1
PCB 4	54000		87.7	1230	-	1.001	1
PCB 10	3070**J**		69.0	3070	-	1.010	1
PCB 9	319**J**		72.7	1230	-	1.123	1
PCB 7	375**J**		61.6	1230	-	1.131	1
PCB 6	742**J**		67.9	1230	-	1.152	1
PCB 5	ND	U	72.7	1230	-		1
PCB 8	2550**J**		62.1	3070	-	1.180	1
PCB 14	ND	U	69.7	1230	-		1
PCB 11	1550**J**		71.6	6130	-	0.970	1
PCBs 12 + 13	365**J**		67.3	3070	-	0.985	1
PCB 15	2730		82.1	1230	-	1.001	1
PCB 19	106000		294	1230	1.03	1.001	1
PCB 18	1220**J**		257	3070	1.10	1.085	1
PCB 30	8430		350	3070	1.02	1.096	1
PCB 17	36600		357	1230	1.04	1.117	1
PCB 27	10800		281	1230	1.00	1.131	1
PCB 24	ND	U	228	1230			1
PCB 16	704**JK**		412	1230	0.42	1.149	1
PCB 32	37100		243	1230	1.07	1.172	1
PCB 34	ND	U	1550	1550			1
PCB 23	ND	U	1320	1320			1
PCBs 26 + 29	ND	U	1420	3070			1
PCB 25	2140		1040	1230	0.94	0.834	1
PCB 31	5430		1290	3070	1.03	0.844	1
PCBs 20 + 28	491000		1370	3070	1.05	0.854	1
PCBs 21 + 33	ND	U	1230	3070			1
PCB 22	ND	U	1430	1430			1
PCB 36	ND	U	1320	1320			1
PCB 39	ND	U	1250	1250			1
PCB 38	ND	U	1500	1500			1
PCB 35	ND	U	1460	1460			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	1830	1830			1
PCB 54	361000		141	1230	0.77	1.002	1
PCBs 50 + 53	129000		574	6130	0.74	0.912	1
PCBs 45 + 51	152000		595	3070	0.77	0.939	1
PCB 46	6010		721	1230	0.72	0.954	1
PCB 52	90000		642	3070	0.80	1.001	1
PCBs 43 + 73	ND	U	514	3070			1
PCB 69	ND	U	357	6130			1
PCB 49	114000		554	6130	0.80	1.019	1
PCB 48	ND	U	543	3070			1
PCBs 44 + 47 + 65	677000		500	6130	0.75	1.039	1
PCBs 59 + 62 + 75	7530		428	6130	0.73	1.048	1
PCB 42	3110**J**		484	6130	0.83	1.062	1
PCB 41	ND	U	728	6130			1
PCBs 40 + 71	19700		559	6130	0.89	1.081	1
PCB 64	2220**J**		307	3070	0.73	1.089	1
PCB 72	ND	U	430	3070			1
PCB 68	ND	U	397	3070			1
PCB 57	ND	U	477	3070			1
PCB 58	2620**J**		430	3070	0.81	1.154	1
PCB 67	ND	U	413	3070			1
PCB 63	ND	U	432	3070			1
PCB 61	ND	U	446	12300			1
PCBs 70 + 74 + 76	7520**J**		391	12300	0.74	1.186	1
PCB 66	6170		470	3070	0.75	1.198	1
PCB 55	ND	U	479	3070			1
PCB 56	1820**J**		221	3070	0.66	0.911	1
PCB 60	411**J**		213	3070	0.77	0.917	1
PCB 80	ND	U	191	3070			1
PCB 79	16600		207	3070	0.75	0.969	1
PCB 78	ND	U	231	3070			1
PCB 81	ND	U	275	1230			1
PCB 77	ND	U	268	1230			1
PCB 104	3170**K**		202	1230	1.28	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	8190		247	3070	1.55	1.022	1
PCB 103	10900		295	3070	1.57	1.083	1
PCB 94	8270		336	3070	1.60	1.097	1
PCBs 95 + 100	115000		301	12300	1.53	1.115	1
PCB 93	ND	U	374	12300			1
PCBs 98 + 102	7050**J**		276	12300	1.50	1.126	1
PCB 88	ND	U	354	3070			1
PCB 91	30000		294	3070	1.51	1.146	1
PCB 84	7160		365	1230	1.37	1.159	1
PCB 89	ND	U	771	3070			1
PCB 121	ND	U	322	3070			1
PCB 92	13300**K**		552	3070	1.81	0.983	1
PCBs 90 + 101 + 113	82600		475	12300	1.56	1.001	1
PCBs 83 + 99	17800		542	6130	1.59	1.018	1
PCB 112	ND	U	388	3070			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	640000		444	12300	1.55	1.036	1
PCBs 117 + 116	2640**J**		410	6130	1.35	1.053	1
PCB 85	ND	U	568	6130			1
PCBs 110 + 115	28300		336	6130	1.50	1.065	1
PCB 82	ND	U	1210	3070			1
PCB 111	622000		291	3070	1.53	1.080	1
PCB 120	ND	U	363	3070			1
PCBs 108 + 124	ND	U	633	6130			1
PCB 107	ND	U	604	3070			1
PCB 123	ND	U	722	1230			1
PCB 106	ND	U	682	3070			1
PCB 118	10900		725	1230	1.55	1.000	1
PCB 122	ND	U	744	3070			1
PCB 114	ND	U	717	1230			1
PCB 105	2270		712	1230	1.39	1.000	1
PCB 127	ND	U	656	3070			1
PCB 126	ND	U	726	1230			1
PCB 155	194**J**		145	1230	1.36	1.001	1
PCB 152	ND	U	182	3070			1
PCB 150	1930**J**		137	3070	1.24	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	26100		171	3070	1.28	1.036	1
PCB 145	ND	U	151	3070			1
PCB 148	688**JK**		223	3070	1.60	1.083	1
PCB 151	49200		260	6130	1.18	1.105	1
PCBs 135 + 154	10100		183	6130	1.41	1.108	1
PCB 144	6160		218	3070	1.27	1.122	1
PCBs 147 + 149	88700		433	6130	1.21	0.895	1
PCB 134	2510**JK**		388	6130	1.02	0.902	1
PCB 143	ND	U	586	6130			1
PCBs 139 + 140	ND	U	431	6130			1
PCB 131	ND	U	407	3070			1
PCB 142	ND	U	558	3070			1
PCB 132	20500		476	3070	1.23	0.930	1
PCB 133	ND	U	507	3070			1
PCB 165	ND	U	352	3070			1
PCB 146	10000		441	3070	1.19	0.951	1
PCB 161	ND	U	350	3070			1
PCBs 153 + 168	762000		364	6130	1.25	0.966	1
PCB 141	16200		467	3070	1.08	0.974	1
PCB 130	ND	U	550	3070			1
PCB 137	ND	U	441	3070			1
PCB 164	3990		367	3070	1.41	0.994	1
PCBs 129 + 138 + 163	67200		525	12300	1.18	1.001	1
PCB 160	ND	U	213	12300			1
PCB 158	22100**K**		327	3070	1.01	1.009	1
PCB 166	ND	U	364	6130			1
PCB 128	2600**J**		479	6130	1.07	1.035	1
PCB 159	639**JK**		416	3070	0.74	0.984	1
PCB 162	ND	U	395	3070			1
PCB 167	737**JK**		347	1230	0.77	1.001	1
PCBs 156 + 157	2630		683	2450	1.08	1.000	1
PCB 169	ND	U	353	1230			1
PCB 188	ND	U	132	1230			1
PCB 179	10100		108	3070	1.08	1.015	1
PCB 184	ND	U	95.3	3070			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	2160**JK**		111	3070	0.87	1.037	1
PCB 186	ND	U	104	3070			1
PCB 178	622000		153	3070	1.02	1.083	1
PCB 175	1210**JK**		145	3070	0.44	1.099	1
PCB 187	18900		126	3070	1.04	1.107	1
PCB 182	ND	U	143	3070			1
PCB 183	9770		450	6130	1.07	1.123	1
PCB 185	1920**J**		437	6130	1.21	1.128	1
PCB 174	16700		484	3070	0.93	1.134	1
PCB 177	9570		510	3070	1.04	1.145	1
PCB 181	ND	U	427	3070			1
PCBs 171 + 173	4090**J**		508	6130	0.94	1.161	1
PCB 172	1840**JK**		516	3070	0.85	0.899	1
PCB 192	ND	U	360	3070			1
PCBs 180 + 193	23100		357	6130	1.07	0.912	1
PCB 191	ND	U	367	3070			1
PCB 170	10900**K**		537	3070	1.34	0.940	1
PCB 190	2150**J**		364	3070	1.16	0.949	1
PCB 189	ND	U	326	1230			1
PCB 202	805**J**		148	1230	0.79	1.001	1
PCB 201	360**J**		130	3070	0.81	1.022	1
PCB 204	ND	U	134	3070			1
PCB 197	ND	U	121	6130			1
PCB 200	476**J**		135	6130	0.91	1.048	1
PCBs 198 + 199	3620**J**		186	6130	0.81	1.112	1
PCB 196	1990**J**		192	3070	0.97	0.917	1
PCB 203	1880**J**		161	3070	0.86	0.920	1
PCB 195	1460**JK**		202	3070	1.10	0.948	1
PCB 194	2880**J**		195	3070	0.96	0.991	1
PCB 205	208**J**		166	1230	0.78	1.000	1
PCB 208	ND	U	221	1230			1
PCB 207	ND	U	243	3070			1
PCB 206	416**JK**		267	1230	1.05	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	ND	U	170	1230			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	425	**J**	131	3070			1
Total DiCB	65700		61.6	6130			1
Total TriCB	700000		228	3070			1
Total TetraCB	1600000		141	12300			1
Total PentaCB	1610000		202	12300			1
Total HexaCB	1090000		137	12300			1
Total HeptaCB	735000		95.3	6130			1
Total OctaCB	13700		121	6130			1
Total NonaCB	416	**J**	221	3070			1
Total PCBs	5820000		61.6	12300			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	Percent
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 16:22
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	16.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238759	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1358.659	68		5-145	3.14	0.751
PCB 3L	2000	1307.326	65		5-145	3.43	0.876
PCB 4L	2000	1441.469	72		5-145	1.58	0.892
PCB 15L	2000	1351.294	68		5-145	1.59	1.232
PCB 19L	2000	1536.777	77		5-145	1.06	1.073
PCB 37L	2000	1371.840	69		5-145	1.02	1.089
PCB 54L	2000	1771.677	89		5-145	0.79	0.831
PCB 81L	2000	1285.714	64		10-145	0.81	1.348
PCB 77L	2000	1364.183	68		10-145	0.80	1.373
PCB 104L	2000	1831.700	92		10-145	1.52	0.821
PCB 123L	2000	1373.615	69		10-145	1.55	1.143
PCB 118L	2000	1408.630	70		10-145	1.62	1.154
PCB 114L	2000	1380.138	69		10-145	1.61	1.170
PCB 105L	2000	1459.280	73		10-145	1.64	1.194
PCB 126L	2000	1322.647	66		10-145	1.58	1.289
PCB 155L	2000	2138.753	107		10-145	1.25	0.789
PCB 167L	2000	1608.229	80		10-145	1.28	1.072
PCBs 156L + 157L	4000	3283.728	82		10-145	1.27	1.103
PCB 169L	2000	1712.256	86		10-145	1.26	1.185
PCB 188L	2000	1529.893	76		10-145	1.10	0.718
PCB 189L	2000	1520.488	76		10-145	1.03	0.960
PCB 202L	2000	1546.569	77		10-145	0.89	0.821
PCB 205L	2000	1458.945	73		10-145	0.90	1.009
PCB 208L	2000	1599.978	80		10-145	0.79	0.947
PCB 206L	2000	1603.257	80		10-145	0.79	1.042
PCB 209L	2000	1603.322	80		10-145	1.17	1.070
PCB 28L	2000	1517.812	76		5-145	1.03	0.929
PCB 111L	2000	1536.973	77		10-145	1.55	1.079
PCB 178L	2000	1827.511	91		10-145	1.06	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP002A	**Units:**	ng/Kg
Lab Code:	K1411748-024	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	275	1230	1	0.0003	
PCB 77	ND	268	1230	1	0.0001	
PCB 123	ND	722	1230	1	0.00003	
PCB 118	**10900**	725	1230	1	0.00003	0.327
PCB 114	ND	717	1230	1	0.00003	
PCB 105	**2270**	712	1230	1	0.00003	0.0681
PCB 126	ND	726	1230	1	0.1	
PCB 167	**737**	347	1230	1	0.00003	0.0221
PCBs 156 + 157	**2630**	683	2450	1	0.00003	0.0789
PCB 169	ND	353	1230	1	0.03	
PCB 189	ND	326	1230	1	0.00003	
		Total TEQ				0.496

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	6740	22700			1
PCB 2	ND	U	10100	22700			1
PCB 3	ND	U	10400	22700			1
PCB 4	ND	U	4040	22700	-		1
PCB 10	ND	U	3270	56800	-		1
PCB 9	ND	U	5460	22700	-		1
PCB 7	ND	U	4360	22700	-		1
PCB 6	ND	U	4940	22700	-		1
PCB 5	ND	U	4870	22700	-		1
PCB 8	ND	U	4340	56800	-		1
PCB 14	ND	U	4960	22700	-		1
PCB 11	ND	U	5520	114000	-		1
PCBs 12 + 13	ND	U	5040	56800	-		1
PCB 15	ND	U	6590	22700	-		1
PCB 19	ND	U	18200	22700			1
PCB 18	ND	U	16800	56800			1
PCB 30	ND	U	23900	56800			1
PCB 17	ND	U	24700	24700			1
PCB 27	ND	U	17600	22700			1
PCB 24	ND	U	16200	22700			1
PCB 16	ND	U	28200	28200			1
PCB 32	ND	U	16400	22700			1
PCB 34	ND	U	16200	22700			1
PCB 23	ND	U	13100	22700			1
PCBs 26 + 29	ND	U	13900	56800			1
PCB 25	ND	U	10900	22700			1
PCB 31	ND	U	13700	56800			1
PCBs 20 + 28	374000		15100	56800	1.02	0.853	1
PCBs 21 + 33	ND	U	12100	56800			1
PCB 22	ND	U	14200	22700			1
PCB 36	ND	U	13200	22700			1
PCB 39	ND	U	12100	22700			1
PCB 38	ND	U	14800	22700			1
PCB 35	ND	U	15900	22700			1
PCB 37	ND	U	21700	22700			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	74200**K**		9570	22700	0.64	1.001	1
PCBs 50 + 53	25000**J**		12000	114000	0.79	0.912	1
PCBs 45 + 51	34100**JK**		11700	56800	0.55	0.938	1
PCB 46	ND	U	14100	22700			1
PCB 52	ND	U	12300	56800			1
PCBs 43 + 73	ND	U	10800	56800			1
PCB 69	ND	U	7200	114000			1
PCB 49	34800**J**		10500	114000	0.73	1.020	1
PCB 48	ND	U	10900	56800			1
PCBs 44 + 47 + 65	2120000		10300	114000	0.78	1.039	1
PCBs 59 + 62 + 75	24400**JK**		12700	114000	1.19	1.048	1
PCB 42	ND	U	9720	114000			1
PCB 41	ND	U	14800	114000			1
PCBs 40 + 71	ND	U	11600	114000			1
PCB 64	ND	U	6120	56800			1
PCB 72	ND	U	9110	56800			1
PCB 68	ND	U	8520	56800			1
PCB 57	ND	U	9960	56800			1
PCB 58	ND	U	9510	56800			1
PCB 67	ND	U	8450	56800			1
PCB 63	ND	U	9560	56800			1
PCB 61	ND	U	9540	227000			1
PCBs 70 + 74 + 76	ND	U	8290	227000			1
PCB 66	ND	U	10300	56800			1
PCB 55	ND	U	10600	56800			1
PCB 56	ND	U	14500	56800			1
PCB 60	ND	U	13000	56800			1
PCB 80	ND	U	11800	56800			1
PCB 79	160000		12600	56800	0.80	0.969	1
PCB 78	ND	U	15200	56800			1
PCB 81	ND	U	16200	22700			1
PCB 77	ND	U	17800	22700			1
PCB 104	ND	U	12700	22700			1
PCB 96	ND	U	13500	56800			1
PCB 103	ND	U	16000	56800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	18400	56800			1
PCBs 95 + 100	48800**JK**		16600	227000	0.95	1.116	1
PCB 93	ND	U	19300	227000			1
PCBs 98 + 102	ND	U	16000	227000			1
PCB 88	ND	U	19500	56800			1
PCB 91	ND	U	15700	56800			1
PCB 84	ND	U	22000	22700			1
PCB 89	ND	U	28200	56800			1
PCB 121	ND	U	13000	56800			1
PCB 92	ND	U	22100	56800			1
PCBs 90 + 101 + 113	34600**JK**		18500	227000	2.20	1.001	1
PCBs 83 + 99	ND	U	21500	114000			1
PCB 112	ND	U	15500	56800			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	5620000		17900	227000	1.62	1.036	1
PCBs 117 + 116	ND	U	16100	114000			1
PCB 85	ND	U	21600	114000			1
PCBs 110 + 115	ND	U	13100	114000			1
PCB 82	ND	U	33400	56800			1
PCB 111	8610000		13900	56800	1.57	1.080	1
PCB 120	ND	U	15400	56800			1
PCBs 108 + 124	ND	U	17900	114000			1
PCB 107	ND	U	19400	56800			1
PCB 123	ND	U	19800	22700			1
PCB 106	ND	U	18400	56800			1
PCB 118	ND	U	21000	22700			1
PCB 122	ND	U	20900	56800			1
PCB 114	ND	U	20400	22700			1
PCB 105	ND	U	20600	22700			1
PCB 127	ND	U	22500	56800			1
PCB 126	ND	U	20000	22700			1
PCB 155	ND	U	9270	22700			1
PCB 152	ND	U	11000	56800			1
PCB 150	ND	U	9950	56800			1
PCB 136	ND	U	11000	56800			1
PCB 145	ND	U	9600	56800			1
PCB 148	ND	U	15300	56800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	19900**JK**		16800	114000	1.50	1.105	1
PCBs 135 + 154	ND	U	13100	114000			1
PCB 144	ND	U	14900	56800			1
PCBs 147 + 149	41700**J**		14100	114000	1.06	0.895	1
PCB 134	ND	U	13100	114000			1
PCB 143	ND	U	17200	114000			1
PCBs 139 + 140	ND	U	14200	114000			1
PCB 131	ND	U	14000	56800			1
PCB 142	ND	U	17800	56800			1
PCB 132	ND	U	16300	56800			1
PCB 133	ND	U	17400	56800			1
PCB 165	ND	U	11700	56800			1
PCB 146	ND	U	13400	56800			1
PCB 161	ND	U	12300	56800			1
PCBs 153 + 168	8330000		12400	114000	1.25	0.966	1
PCB 141	ND	U	15700	56800			1
PCB 130	ND	U	18200	56800			1
PCB 137	ND	U	14800	56800			1
PCB 164	ND	U	11900	56800			1
PCBs 129 + 138 + 163	57600**JK**		17500	227000	0.87	1.000	1
PCB 160	ND	U	7180	227000			1
PCB 158	257000		11100	56800	1.24	1.009	1
PCB 166	ND	U	11800	114000			1
PCB 128	ND	U	16100	114000			1
PCB 159	ND	U	15500	56800			1
PCB 162	ND	U	14600	56800			1
PCB 167	ND	U	12100	22700			1
PCBs 156 + 157	ND	U	25700	45500			1
PCB 169	ND	U	13400	22700			1
PCB 188	ND	U	12900	22700			1
PCB 179	12800**J**		11200	56800	0.93	1.015	1
PCB 184	ND	U	10200	56800			1
PCB 176	ND	U	11100	56800			1
PCB 186	ND	U	10700	56800			1
PCB 178	5990000		16300	56800	1.08	1.083	1
PCB 175	ND	U	15400	56800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	19900**JK**		13000	56800	0.80	1.106	1
PCB 182	ND	U	14200	56800			1
PCB 183	ND	U	20000	114000			1
PCB 185	ND	U	19600	114000			1
PCB 174	ND	U	19600	56800			1
PCB 177	ND	U	21400	56800			1
PCB 181	ND	U	18400	56800			1
PCBs 171 + 173	ND	U	23000	114000			1
PCB 172	ND	U	22400	56800			1
PCB 192	ND	U	16300	56800			1
PCBs 180 + 193	32600**J**		16100	114000	0.95	0.911	1
PCB 191	ND	U	17100	56800			1
PCB 170	ND	U	24200	56800			1
PCB 190	ND	U	15000	56800			1
PCB 189	ND	U	16100	22700			1
PCB 202	ND	U	10300	22700			1
PCB 201	ND	U	9520	56800			1
PCB 204	ND	U	9550	56800			1
PCB 197	ND	U	8950	114000			1
PCB 200	ND	U	9760	114000			1
PCBs 198 + 199	ND	U	13300	114000			1
PCB 196	ND	U	13900	56800			1
PCB 203	ND	U	11900	56800			1
PCB 195	ND	U	14200	56800			1
PCB 194	ND	U	14200	56800			1
PCB 205	ND	U	11800	22700			1
PCB 208	ND	U	11000	22700			1
PCB 207	ND	U	12000	56800			1
PCB 206	ND	U	23600	23600			1
PCB 209	ND	U	17000	22700			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	6740	56800			1
Total DiCB	ND	U	3270	114000			1
Total TriCB	374000		10900	56800			1
Total TetraCB	2470000		6120	227000			1
Total PentaCB	14300000		12700	227000			1
Total HexaCB	8710000		7180	227000			1
Total HeptaCB	6050000		10200	114000			1
Total OctaCB	ND	U	8950	114000			1
Total NonaCB	ND	U	11000	56800			1
Total PCBs	31900000		3270	227000			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	Percent
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 21:56
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	0.8800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238860	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1423.466	71		5-145	3.30	0.751
PCB 3L	2000	1388.091	69		5-145	3.53	0.878
PCB 4L	2000	1490.924	75		5-145	1.51	0.893
PCB 15L	2000	1271.835	64		5-145	1.62	1.236
PCB 19L	2000	1534.685	77		5-145	1.03	1.073
PCB 37L	2000	1307.148	65		5-145	1.03	1.091
PCB 54L	2000	1927.990	96		5-145	0.77	0.831
PCB 81L	2000	1373.639	69		10-145	0.77	1.348
PCB 77L	2000	1388.365	69		10-145	0.82	1.374
PCB 104L	2000	1850.687	93		10-145	1.63	0.820
PCB 123L	2000	1470.277	74		10-145	1.63	1.144
PCB 118L	2000	1501.406	75		10-145	1.72	1.154
PCB 114L	2000	1557.539	78		10-145	1.62	1.171
PCB 105L	2000	1547.005	77		10-145	1.57	1.195
PCB 126L	2000	1471.645	74		10-145	1.63	1.290
PCB 155L	2000	2038.142	102		10-145	1.27	0.789
PCB 167L	2000	1619.114	81		10-145	1.21	1.073
PCBs 156L + 157L	4000	3174.017	79		10-145	1.27	1.106
PCB 169L	2000	1720.217	86		10-145	1.29	1.185
PCB 188L	2000	1554.424	78		10-145	1.09	0.718
PCB 189L	2000	1536.745	77		10-145	1.14	0.961
PCB 202L	2000	1549.844	77		10-145	0.90	0.821
PCB 205L	2000	1563.980	78		10-145	0.92	1.009
PCB 208L	2000	1738.723	87		10-145	0.80	0.947
PCB 206L	2000	1625.889	81		10-145	0.89	1.042
PCB 209L	2000	1635.976	82		10-145	1.16	1.071
PCB 28L	2000	1567.840	78		5-145	1.02	0.930
PCB 111L	2000	1811.707	91		10-145	1.55	1.079
PCB 178L	2000	2000.012	100		10-145	1.06	1.008

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW001B	**Units:**	ng/Kg
Lab Code:	K1411748-025	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	16200	22700	1	0.0003	
PCB 77	ND	17800	22700	1	0.0001	
PCB 123	ND	19800	22700	1	0.00003	
PCB 118	ND	21000	22700	1	0.00003	
PCB 114	ND	20400	22700	1	0.00003	
PCB 105	ND	20600	22700	1	0.00003	
PCB 126	ND	20000	22700	1	0.1	
PCB 167	ND	12100	22700	1	0.00003	
PCBs 156 + 157	ND	25700	45500	1	0.00003	
PCB 169	ND	13400	22700	1	0.03	
PCB 189	ND	16100	22700	1	0.00003	
	Total TEQ					0.00

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	3450	10200			1
PCB 2	ND	U	5230	10200			1
PCB 3	ND	U	5460	10200			1
PCB 4	66800		1780	10200	-	1.001	1
PCB 10	ND	U	1430	25500	-		1
PCB 9	ND	U	2640	10200	-		1
PCB 7	ND	U	2110	10200	-		1
PCB 6	ND	U	2390	10200	-		1
PCB 5	ND	U	2350	10200	-		1
PCB 8	6400**J**		2100	25500	-	1.180	1
PCB 14	ND	U	2400	10200	-		1
PCB 11	ND	U	2670	51000	-		1
PCBs 12 + 13	ND	U	2440	25500	-		1
PCB 15	63500		3160	10200	-	1.002	1
PCB 19	153000		9630	10200	0.90	1.002	1
PCB 18	29300		8350	25500	1.11	1.086	1
PCB 30	19500**JK**		11900	25500	1.22	1.097	1
PCB 17	66200		12300	12300	1.16	1.119	1
PCB 27	17800**K**		8730	10200	0.70	1.133	1
PCB 24	ND	U	8040	10200			1
PCB 16	ND	U	14100	14100			1
PCB 32	ND	U	8150	10200			1
PCB 34	ND	U	114000	114000			1
PCB 23	ND	U	91900	91900			1
PCBs 26 + 29	ND	U	97400	97400			1
PCB 25	ND	U	76200	76200			1
PCB 31	ND	U	95600	95600			1
PCBs 20 + 28	17800000		106000	106000	1.02	0.854	1
PCBs 21 + 33	ND	U	84600	84600			1
PCB 22	ND	U	99600	99600			1
PCB 36	ND	U	92100	92100			1
PCB 39	ND	U	84900	84900			1
PCB 38	ND	U	104000	104000			1
PCB 35	ND	U	112000	112000			1
PCB 37	ND	U	147000	147000			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	11500000		4380	10200	0.77	1.002	1
PCBs 50 + 53	122000		7330	51000	0.81	0.912	1
PCBs 45 + 51	71400**K**		7180	25500	1.03	0.939	1
PCB 46	ND	U	8640	10200			1
PCB 52	89000**K**		7520	25500	0.95	1.001	1
PCBs 43 + 73	ND	U	6590	25500			1
PCB 69	ND	U	4420	51000			1
PCB 49	181000		6390	51000	0.70	1.020	1
PCB 48	ND	U	6630	25500			1
PCBs 44 + 47 + 65	14100000		6270	51000	0.77	1.039	1
PCBs 59 + 62 + 75	ND	U	7780	51000			1
PCB 42	14100**JK**		5960	51000	0.99	1.062	1
PCB 41	ND	U	9090	51000			1
PCBs 40 + 71	ND	U	7100	51000			1
PCB 64	ND	U	3760	25500			1
PCB 72	ND	U	5590	25500			1
PCB 68	ND	U	5230	25500			1
PCB 57	ND	U	6110	25500			1
PCB 58	ND	U	5840	25500			1
PCB 67	ND	U	5190	25500			1
PCB 63	ND	U	5870	25500			1
PCB 61	ND	U	5860	102000			1
PCBs 70 + 74 + 76	ND	U	5090	102000			1
PCB 66	ND	U	6270	25500			1
PCB 55	ND	U	6510	25500			1
PCB 56	30300**K**		8960	25500	0.95	0.911	1
PCB 60	ND	U	8030	25500			1
PCB 80	ND	U	7270	25500			1
PCB 79	506000		7790	25500	0.81	0.969	1
PCB 78	ND	U	9390	25500			1
PCB 81	ND	U	10100	10200			1
PCB 77	ND	U	10800	10800			1
PCB 104	5080**JK**		4410	10200	1.26	1.001	1
PCB 96	11100**JK**		4590	25500	1.05	1.022	1
PCB 103	8470**JK**		5430	25500	3.77	1.084	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	6230	25500			1
PCBs 95 + 100	66600**J**		5630	102000	1.77	1.115	1
PCB 93	ND	U	6550	102000			1
PCBs 98 + 102	ND	U	5400	102000			1
PCB 88	ND	U	6600	25500			1
PCB 91	22100**J**		5310	25500	1.69	1.146	1
PCB 84	ND	U	7460	10200			1
PCB 89	ND	U	12100	25500			1
PCB 121	ND	U	5530	25500			1
PCB 92	ND	U	9380	25500			1
PCBs 90 + 101 + 113	ND	U	7840	102000			1
PCBs 83 + 99	ND	U	9140	51000			1
PCB 112	ND	U	6570	25500			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	17300000		7600	102000	1.56	1.037	1
PCBs 117 + 116	ND	U	6850	51000			1
PCB 85	ND	U	9170	51000			1
PCBs 110 + 115	ND	U	5570	51000			1
PCB 82	ND	U	14300	25500			1
PCB 111	22100000		5880	25500	1.57	1.080	1
PCB 120	ND	U	6540	25500			1
PCBs 108 + 124	ND	U	22900	51000			1
PCB 107	ND	U	24900	25500			1
PCB 123	ND	U	25400	25400			1
PCB 106	ND	U	23600	25500			1
PCB 118	ND	U	25400	25400			1
PCB 122	ND	U	26700	26700			1
PCB 114	ND	U	26900	26900			1
PCB 105	ND	U	27200	27200			1
PCB 127	ND	U	28800	28800			1
PCB 126	ND	U	27400	27400			1
PCB 155	ND	U	4970	10200			1
PCB 152	ND	U	5920	25500			1
PCB 150	ND	U	5350	25500			1
PCB 136	13800**JK**		5880	25500	1.74	1.035	1
PCB 145	ND	U	5160	25500			1
PCB 148	ND	U	8230	25500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	25200**JK**		9000	51000	0.95	1.105	1
PCBs 135 + 154	16200**JK**		7040	51000	1.51	1.108	1
PCB 144	ND	U	7990	25500			1
PCBs 147 + 149	ND	U	4930	51000			1
PCB 134	ND	U	4580	51000			1
PCB 143	ND	U	6010	51000			1
PCBs 139 + 140	ND	U	4960	51000			1
PCB 131	ND	U	4890	25500			1
PCB 142	ND	U	6240	25500			1
PCB 132	ND	U	5700	25500			1
PCB 133	ND	U	6090	25500			1
PCB 165	ND	U	4100	25500			1
PCB 146	ND	U	4690	25500			1
PCB 161	ND	U	4300	25500			1
PCBs 153 + 168	22500000		4330	51000	1.25	0.966	1
PCB 141	47100		5500	25500	1.10	0.974	1
PCB 130	ND	U	6380	25500			1
PCB 137	ND	U	5180	25500			1
PCB 164	ND	U	4170	25500			1
PCBs 129 + 138 + 163	ND	U	6150	102000			1
PCB 160	ND	U	2520	102000			1
PCB 158	681000		3890	25500	1.24	1.009	1
PCB 166	ND	U	4140	51000			1
PCB 128	ND	U	5630	51000			1
PCB 159	ND	U	10800	25500			1
PCB 162	ND	U	10200	25500			1
PCB 167	ND	U	8940	10200			1
PCBs 156 + 157	ND	U	17200	20400			1
PCB 169	ND	U	9420	10200			1
PCB 188	ND	U	5740	10200			1
PCB 179	ND	U	4920	25500			1
PCB 184	ND	U	4450	25500			1
PCB 176	ND	U	4880	25500			1
PCB 186	ND	U	4710	25500			1
PCB 178	18200000		7140	25500	1.06	1.083	1
PCB 175	ND	U	6760	25500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	5720	25500			1
PCB 182	ND	U	6210	25500			1
PCB 183	ND	U	12900	51000			1
PCB 185	ND	U	12700	51000			1
PCB 174	ND	U	12700	25500			1
PCB 177	ND	U	13800	25500			1
PCB 181	ND	U	11900	25500			1
PCBs 171 + 173	ND	U	14900	51000			1
PCB 172	ND	U	14500	25500			1
PCB 192	ND	U	10600	25500			1
PCBs 180 + 193	16900**J**		10400	51000	0.97	0.912	1
PCB 191	ND	U	11100	25500			1
PCB 170	ND	U	15700	25500			1
PCB 190	ND	U	9670	25500			1
PCB 189	ND	U	10200	10200			1
PCB 202	6210**J**		5380	10200	0.78	1.000	1
PCB 201	ND	U	5160	25500			1
PCB 204	ND	U	5180	25500			1
PCB 197	ND	U	4850	51000			1
PCB 200	ND	U	5290	51000			1
PCBs 198 + 199	ND	U	7190	51000			1
PCB 196	ND	U	7520	25500			1
PCB 203	ND	U	6430	25500			1
PCB 195	ND	U	7670	25500			1
PCB 194	ND	U	7690	25500			1
PCB 205	ND	U	6640	10200			1
PCB 208	ND	U	5150	10200			1
PCB 207	ND	U	5660	25500			1
PCB 206	ND	U	11900	11900			1
PCB 209	ND	U	9450	10200			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	3450	25500			1
Total DiCB	137000		1430	51000			1
Total TriCB	18100000		8040	25500			1
Total TetraCB	26700000		3760	102000			1
Total PentaCB	39600000		4410	102000			1
Total HexaCB	23300000		2520	102000			1
Total HeptaCB	18200000		4450	51000			1
Total OctaCB	6210**J**		4850	51000			1
Total NonaCB	ND	U	5150	25500			1
Total PCBs	126000000		1430	102000			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	Percent
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 23:00
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.9600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238861	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1476.210	74		5-145	3.08	0.750
PCB 3L	2000	1412.469	71		5-145	3.50	0.877
PCB 4L	2000	1481.408	74		5-145	1.50	0.891
PCB 15L	2000	1261.722	63		5-145	1.58	1.233
PCB 19L	2000	1506.897	75		5-145	1.14	1.071
PCB 37L	2000	1280.453	64		5-145	1.12	1.090
PCB 54L	2000	1881.138	94		5-145	0.83	0.831
PCB 81L	2000	1353.000	68		10-145	0.82	1.349
PCB 77L	2000	1415.387	71		10-145	0.72	1.374
PCB 104L	2000	1731.399	87		10-145	1.61	0.821
PCB 123L	2000	1380.994	69		10-145	1.58	1.144
PCB 118L	2000	1452.761	73		10-145	1.57	1.154
PCB 114L	2000	1430.946	72		10-145	1.43	1.171
PCB 105L	2000	1409.514	70		10-145	1.60	1.195
PCB 126L	2000	1330.201	67		10-145	1.53	1.290
PCB 155L	2000	1977.340	99		10-145	1.31	0.790
PCB 167L	2000	1558.538	78		10-145	1.28	1.073
PCBs 156L + 157L	4000	3178.241	79		10-145	1.28	1.103
PCB 169L	2000	1680.374	84		10-145	1.32	1.185
PCB 188L	2000	1448.216	72		10-145	1.07	0.718
PCB 189L	2000	1472.872	74		10-145	0.97	0.961
PCB 202L	2000	1535.384	77		10-145	0.96	0.821
PCB 205L	2000	1439.066	72		10-145	0.82	1.009
PCB 208L	2000	1674.213	84		10-145	0.74	0.947
PCB 206L	2000	1566.773	78		10-145	0.82	1.042
PCB 209L	2000	1547.659	77		10-145	1.23	1.071
PCB 28L	2000	1688.315	84		5-145	1.08	0.930
PCB 111L	2000	1667.803	83		10-145	1.65	1.079
PCB 178L	2000	1938.148	97		10-145	1.00	1.008

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP001B	**Units:**	ng/Kg
Lab Code:	K1411748-026	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	10100	10200	1	0.0003	
PCB 77	ND	10800	10800	1	0.0001	
PCB 123	ND	25400	25400	1	0.00003	
PCB 118	ND	25400	25400	1	0.00003	
PCB 114	ND	26900	26900	1	0.00003	
PCB 105	ND	27200	27200	1	0.00003	
PCB 126	ND	27400	27400	1	0.1	
PCB 167	ND	8940	10200	1	0.00003	
PCBs 156 + 157	ND	17200	20400	1	0.00003	
PCB 169	ND	9420	10200	1	0.03	
PCB 189	ND	10200	10200	1	0.00003	
	Total TEQ					0.00

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	239		13.8	64.5	3.12	1.001	1
PCB 2	ND	U	15.7	64.5			1
PCB 3	58.3**JK**		15.9	64.5	2.54	1.001	1
PCB 4	7140		25.0	64.5	-	1.001	1
PCB 10	559		20.4	161	-	1.011	1
PCB 9	ND	U	19.2	64.5	-		1
PCB 7	ND	U	17.7	64.5	-		1
PCB 6	55.8**J**		19.9	64.5	-	1.159	1
PCB 5	ND	U	18.6	64.5	-		1
PCB 8	172		19.4	161	-	1.188	1
PCB 14	ND	U	18.6	64.5	-		1
PCB 11	146**J**		18.8	323	-	0.971	1
PCBs 12 + 13	60.2**J**		18.5	161	-	0.984	1
PCB 15	260		20.8	64.5	-	1.001	1
PCB 19	8550		30.3	64.5	1.02	1.002	1
PCB 18	74.8**J**		25.4	161	1.11	1.094	1
PCB 30	334		34.9	161	0.88	1.102	1
PCB 17	1420		36.3	64.5	1.02	1.124	1
PCB 27	1070		25.7	64.5	1.05	1.139	1
PCB 24	ND	U	25.3	64.5			1
PCB 16	ND	U	42.6	64.5			1
PCB 32	935		24.2	64.5	0.95	1.179	1
PCB 34	ND	U	43.9	64.5			1
PCB 23	ND	U	43.2	64.5			1
PCBs 26 + 29	110**JK**		43.4	161	1.93	1.273	1
PCB 25	186		31.6	64.5	1.08	0.830	1
PCB 31	181		44.2	161	1.02	0.841	1
PCBs 20 + 28	42600		44.4	161	1.04	0.852	1
PCBs 21 + 33	ND	U	38.7	161			1
PCB 22	ND	U	42.8	64.5			1
PCB 36	ND	U	40.3	64.5			1
PCB 39	ND	U	37.8	64.5			1
PCB 38	ND	U	44.9	64.5			1
PCB 35	ND	U	44.2	64.5			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	53.0	64.5			1
PCB 54	31500		18.7	64.5	0.75	1.002	1
PCBs 50 + 53	2890		28.8	323	0.76	0.907	1
PCBs 45 + 51	2470		30.1	161	0.76	0.936	1
PCB 46	ND	U	36.1	64.5			1
PCB 52	3130		29.6	161	0.78	1.001	1
PCBs 43 + 73	ND	U	25.5	161			1
PCB 69	ND	U	18.5	323	0.74	1.019	1
PCB 49	3510		29.9	323	0.74	1.019	1
PCB 48	ND	U	27.4	161			1
PCBs 44 + 47 + 65	44800		24.2	323	0.75	1.040	1
PCBs 59 + 62 + 75	ND	U	21.9	323			1
PCB 42	ND	U	24.8	323			1
PCB 41	ND	U	35.3	323			1
PCBs 40 + 71	271**J**		26.8	323	0.75	1.081	1
PCB 64	ND	U	17.3	161			1
PCB 72	ND	U	21.6	161			1
PCB 68	ND	U	19.8	161			1
PCB 57	ND	U	23.4	161			1
PCB 58	ND	U	20.1	161			1
PCB 67	ND	U	21.4	161			1
PCB 63	ND	U	22.1	161			1
PCB 61	ND	U	22.2	645			1
PCBs 70 + 74 + 76	156**JK**		19.3	645	0.58	1.189	1
PCB 66	ND	U	21.8	161			1
PCB 55	ND	U	21.4	161			1
PCB 56	93.3**J**		26.7	161	0.81	0.908	1
PCB 60	ND	U	25.6	161			1
PCB 80	ND	U	23.8	161			1
PCB 79	1420		24.4	161	0.78	0.970	1
PCB 78	ND	U	27.2	161			1
PCB 81	ND	U	29.5	64.5			1
PCB 77	ND	U	28.6	64.5			1
PCB 104	83.8**K**		17.8	64.5	1.96	1.001	1
PCB 96	208		18.1	161	1.71	1.019	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	501		20.4	161	1.67	1.088	1
PCB 94	205		22.8	161	1.68	1.100	1
PCBs 95 + 100	3070		20.9	645	1.62	1.118	1
PCB 93	ND	U	26.3	645			1
PCBs 98 + 102	233**J**		18.9	645	1.78	1.130	1
PCB 88	ND	U	24.2	161			1
PCB 91	1140		21.0	161	1.66	1.149	1
PCB 84	307		26.4	64.5	1.52	1.160	1
PCB 89	ND	U	25.5	161			1
PCB 121	ND	U	31.9	161			1
PCB 92	881		42.9	161	1.44	0.982	1
PCBs 90 + 101 + 113	2710		35.5	645	1.56	1.000	1
PCBs 83 + 99	1540		39.2	323	1.47	1.018	1
PCB 112	ND	U	30.7	161			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	56600		34.2	645	1.53	1.036	1
PCBs 117 + 116	ND	U	31.1	323			1
PCB 85	ND	U	40.8	323			1
PCBs 110 + 115	991		26.5	323	1.52	1.064	1
PCB 82	ND	U	52.2	161			1
PCB 111	70000		29.8	161	1.55	1.083	1
PCB 120	ND	U	30.2	161			1
PCBs 108 + 124	ND	U	52.6	323			1
PCB 107	120**JK**		57.5	161	1.85	0.997	1
PCB 123	ND	U	54.0	64.5			1
PCB 106	ND	U	59.5	161			1
PCB 118	558		51.8	64.5	1.78	1.000	1
PCB 122	ND	U	56.9	161			1
PCB 114	ND	U	54.3	64.5			1
PCB 105	ND	U	51.6	64.5			1
PCB 127	ND	U	55.9	161			1
PCB 126	ND	U	51.1	64.5			1
PCB 155	ND	U	25.6	64.5			1
PCB 152	ND	U	23.5	161			1
PCB 150	96.9**JK**		19.5	161	0.84	1.017	1
PCB 136	1310		22.8	161	1.25	1.032	1
PCB 145	ND	U	21.1	161			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 148	32.9**JK**		28.6	161	1.65	1.082	1
PCB 151	3160		30.4	323	1.17	1.105	1
PCBs 135 + 154	754**K**		25.7	323	1.70	1.107	1
PCB 144	315		28.8	161	1.26	1.123	1
PCBs 147 + 149	5910		35.2	323	1.21	0.894	1
PCB 134	ND	U	36.4	323			1
PCB 143	ND	U	42.4	323			1
PCBs 139 + 140	ND	U	36.8	323			1
PCB 131	ND	U	34.1	161			1
PCB 142	ND	U	45.3	161			1
PCB 132	1660		42.0	161	1.29	0.927	1
PCB 133	ND	U	42.7	161			1
PCB 165	ND	U	30.7	161			1
PCB 146	1620		36.3	161	1.25	0.953	1
PCB 161	ND	U	31.3	161			1
PCBs 153 + 168	66600		31.5	323	1.23	0.968	1
PCB 141	1460		40.7	161	1.24	0.974	1
PCB 130	224**K**		47.3	161	1.45	0.985	1
PCB 137	ND	U	38.2	161			1
PCB 164	452		32.0	161	1.17	0.994	1
PCBs 129 + 138 + 163	7860		41.5	645	1.20	1.001	1
PCB 160	ND	U	19.6	645			1
PCB 158	1870		29.0	161	1.15	1.010	1
PCB 166	ND	U	32.1	323	1.33	1.034	1
PCB 128	509		39.3	323	1.33	1.034	1
PCB 159	112**J**		30.4	161	1.21	0.982	1
PCB 162	ND	U	26.7	161			1
PCB 167	230		24.7	64.5	1.09	1.001	1
PCBs 156 + 157	583**K**		40.3	129	1.44	1.000	1
PCB 169	ND	U	24.2	64.5			1
PCB 188	ND	U	23.8	64.5			1
PCB 179	1620		19.5	161	0.94	1.013	1
PCB 184	ND	U	17.3	161			1
PCB 176	511		20.2	161	0.93	1.037	1
PCB 186	ND	U	18.6	161			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 178	48100		27.3	161	0.98	1.084	1
PCB 175	172		25.7	161	0.94	1.101	1
PCB 187	4390		22.0	161	0.97	1.109	1
PCB 182	ND	U	24.6	161			1
PCB 183	2320		32.2	323	0.93	1.125	1
PCB 185	290**J**		28.9	323	1.13	1.130	1
PCB 174	3790		31.5	161	0.95	1.134	1
PCB 177	2420		34.0	161	1.02	1.146	1
PCB 181	ND	U	28.6	161			1
PCBs 171 + 173	1300		33.5	323	0.98	1.163	1
PCB 172	668		34.5	161	1.03	0.898	1
PCB 192	ND	U	24.9	161			1
PCBs 180 + 193	8620		24.0	323	0.99	0.912	1
PCB 191	215		25.9	161	0.97	0.918	1
PCB 170	4450		34.1	161	0.99	0.938	1
PCB 190	977		25.1	161	0.98	0.948	1
PCB 189	185		19.4	64.5	0.93	1.000	1
PCB 202	244**K**		23.5	64.5	0.70	1.000	1
PCB 201	197		23.0	161	1.00	1.022	1
PCB 204	ND	U	23.2	161			1
PCB 197	93.8**J**		21.1	323	0.80	1.042	1
PCB 200	232**J**		23.6	323	0.94	1.048	1
PCBs 198 + 199	1630		30.5	323	0.84	1.113	1
PCB 196	1220		31.7	161	0.86	0.917	1
PCB 203	1030		26.4	161	0.89	0.920	1
PCB 195	932		33.1	161	0.89	0.947	1
PCB 194	2110		32.7	161	0.81	0.992	1
PCB 205	123**K**		24.3	64.5	1.04	1.001	1
PCB 208	59.4**J**		18.3	64.5	0.87	1.000	1
PCB 207	73.9**JK**		23.9	161	1.03	1.019	1
PCB 206	354		45.7	64.5	0.86	1.000	1
PCB 209	ND	U	23.5	64.5			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	297		13.8	161			1
Total DiCB	8390		17.7	323			1
Total TriCB	55500		24.2	161			1
Total TetraCB	90300		17.3	645			1
Total PentaCB	139000		17.8	645			1
Total HexaCB	94700		19.5	645			1
Total HeptaCB	80000		17.3	323			1
Total OctaCB	7820		21.1	323			1
Total NonaCB	487		18.3	161			1
Total PCBs	477000		13.8	645			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	Percent
Lab Code:	EQ1400690-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/12/14 15:44
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U151536	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151535

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	496.943	25		5-145	3.02	0.744
PCB 3L	2000	543.046	27		5-145	3.14	0.870
PCB 4L	2000	670.559	34		5-145	1.61	0.886
PCB 15L	2000	673.216	34		5-145	1.61	1.236
PCB 19L	2000	677.132	34		5-145	1.03	1.071
PCB 37L	2000	666.107	33		5-145	1.04	1.089
PCB 54L	2000	805.472	40		5-145	0.78	0.823
PCB 81L	2000	602.796	30		10-145	0.79	1.356
PCB 77L	2000	610.807	31		10-145	0.82	1.380
PCB 104L	2000	774.583	39		10-145	1.55	0.815
PCB 123L	2000	633.078	32		10-145	1.59	1.146
PCB 118L	2000	621.604	31		10-145	1.54	1.156
PCB 114L	2000	597.959	30		10-145	1.60	1.173
PCB 105L	2000	628.415	31		10-145	1.60	1.196
PCB 126L	2000	599.178	30		10-145	1.54	1.293
PCB 155L	2000	899.955	45		10-145	1.27	0.788
PCB 167L	2000	664.085	33		10-145	1.23	1.075
PCBs 156L + 157L	4000	1390.382	35		10-145	1.26	1.105
PCB 169L	2000	693.743	35		10-145	1.26	1.187
PCB 188L	2000	577.589	29		10-145	1.09	0.716
PCB 189L	2000	620.580	31		10-145	1.01	0.960
PCB 202L	2000	612.341	31		10-145	0.86	0.820
PCB 205L	2000	730.553	37		10-145	0.87	1.009
PCB 208L	2000	734.562	37		10-145	0.78	0.948
PCB 206L	2000	679.705	34		10-145	0.80	1.042
PCB 209L	2000	1018.138	51		10-145	1.18	1.072
PCB 28L	2000	609.315	30		5-145	1.05	0.927
PCB 111L	2000	619.774	31		10-145	1.54	1.083
PCB 178L	2000	740.027	37		10-145	1.09	1.009

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	230	1470			1
PCB 2	ND	U	298	1470			1
PCB 3	ND	U	317	1470			1
PCB 4	ND	U	141	1470	-		1
PCB 10	ND	U	114	3680	-		1
PCB 9	ND	U	112	1470	-		1
PCB 7	ND	U	94.2	1470	-		1
PCB 6	ND	U	104	1470	-		1
PCB 5	ND	U	112	1470	-		1
PCB 8	ND	U	95.0	3680	-		1
PCB 14	ND	U	107	1470	-		1
PCB 11	ND	U	110	7350	-		1
PCBs 12 + 13	ND	U	103	3680	-		1
PCB 15	ND	U	129	1470	-		1
PCB 19	ND	U	424	1470			1
PCB 18	ND	U	365	3680			1
PCB 30	ND	U	497	3680			1
PCB 17	ND	U	507	1470			1
PCB 27	ND	U	400	1470			1
PCB 24	ND	U	324	1470			1
PCB 16	ND	U	585	1470			1
PCB 32	ND	U	345	1470			1
PCB 34	ND	U	393	1470			1
PCB 23	ND	U	333	1470			1
PCBs 26 + 29	ND	U	360	3680			1
PCB 25	ND	U	264	1470			1
PCB 31	ND	U	326	3680			1
PCBs 20 + 28	ND	U	346	3680			1
PCBs 21 + 33	ND	U	312	3680			1
PCB 22	ND	U	362	1470			1
PCB 36	ND	U	334	1470			1
PCB 39	ND	U	316	1470			1
PCB 38	ND	U	381	1470			1
PCB 35	ND	U	371	1470			1
PCB 37	ND	U	459	1470			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	ND	U	148	1470			1
PCBs 50 + 53	ND	U	301	7350			1
PCBs 45 + 51	ND	U	312	3680			1
PCB 46	ND	U	378	1470			1
PCB 52	642**J**		337	3680	0.67	1.001	1
PCBs 43 + 73	ND	U	270	3680			1
PCB 69	ND	U	187	7350			1
PCB 49	ND	U	290	7350			1
PCB 48	ND	U	285	3680			1
PCBs 44 + 47 + 65	449**JK**		262	7350	0.59	1.039	1
PCBs 59 + 62 + 75	ND	U	224	7350			1
PCB 42	ND	U	254	7350			1
PCB 41	ND	U	381	7350			1
PCBs 40 + 71	ND	U	293	7350			1
PCB 64	ND	U	161	3680			1
PCB 72	ND	U	226	3680			1
PCB 68	ND	U	208	3680			1
PCB 57	ND	U	250	3680			1
PCB 58	ND	U	225	3680			1
PCB 67	ND	U	216	3680			1
PCB 63	ND	U	227	3680			1
PCB 61	ND	U	234	14700			1
PCBs 70 + 74 + 76	ND	U	205	14700			1
PCB 66	ND	U	246	3680			1
PCB 55	ND	U	251	3680			1
PCB 56	ND	U	264	3680			1
PCB 60	ND	U	253	3680			1
PCB 80	ND	U	227	3680			1
PCB 79	ND	U	246	3680			1
PCB 78	ND	U	274	3680			1
PCB 81	ND	U	319	1470			1
PCB 77	ND	U	329	1470			1
PCB 104	ND	U	354	1470			1
PCB 96	ND	U	416	3680			1
PCB 103	ND	U	498	3680			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	566	3680			1
PCBs 95 + 100	ND	U	508	14700			1
PCB 93	ND	U	631	14700			1
PCBs 98 + 102	ND	U	466	14700			1
PCB 88	ND	U	598	3680			1
PCB 91	ND	U	497	3680			1
PCB 84	ND	U	616	1470			1
PCB 89	ND	U	785	3680			1
PCB 121	ND	U	328	3680			1
PCB 92	ND	U	562	3680			1
PCBs 90 + 101 + 113	ND	U	485	14700			1
PCBs 83 + 99	ND	U	553	7350			1
PCB 112	ND	U	395	3680			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	ND	U	453	14700			1
PCBs 117 + 116	ND	U	418	7350			1
PCB 85	ND	U	579	7350			1
PCBs 110 + 115	ND	U	342	7350			1
PCB 82	ND	U	1230	3680			1
PCB 111	446**J**		297	3680	1.35	1.081	1
PCB 120	ND	U	370	3680			1
PCBs 108 + 124	ND	U	479	7350			1
PCB 107	ND	U	457	3680			1
PCB 123	ND	U	528	1470			1
PCB 106	ND	U	516	3680			1
PCB 118	ND	U	554	1470			1
PCB 122	ND	U	562	3680			1
PCB 114	ND	U	532	1470			1
PCB 105	ND	U	545	1470			1
PCB 127	ND	U	496	3680			1
PCB 126	ND	U	532	1470			1
PCB 155	ND	U	190	1470			1
PCB 152	ND	U	246	3680			1
PCB 150	ND	U	185	3680			1
PCB 136	ND	U	231	3680			1
PCB 145	ND	U	204	3680			1
PCB 148	ND	U	301	3680			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	ND	U	352	7350			1
PCBs 135 + 154	ND	U	247	7350			1
PCB 144	ND	U	295	3680			1
PCBs 147 + 149	ND	U	402	7350			1
PCB 134	ND	U	360	7350			1
PCB 143	ND	U	543	7350			1
PCBs 139 + 140	ND	U	400	7350			1
PCB 131	ND	U	377	3680			1
PCB 142	ND	U	518	3680			1
PCB 132	ND	U	441	3680			1
PCB 133	ND	U	471	3680			1
PCB 165	ND	U	326	3680			1
PCB 146	ND	U	409	3680			1
PCB 161	ND	U	324	3680			1
PCBs 153 + 168	952**J**		337	7350	1.05	0.966	1
PCB 141	ND	U	434	3680			1
PCB 130	ND	U	510	3680			1
PCB 137	ND	U	409	3680			1
PCB 164	ND	U	340	3680			1
PCBs 129 + 138 + 163	ND	U	487	14700			1
PCB 160	ND	U	198	14700			1
PCB 158	ND	U	303	3680			1
PCB 166	ND	U	338	7350			1
PCB 128	ND	U	444	7350			1
PCB 159	ND	U	354	3680			1
PCB 162	ND	U	336	3680			1
PCB 167	ND	U	294	1470			1
PCBs 156 + 157	ND	U	589	2940			1
PCB 169	ND	U	308	1470			1
PCB 188	ND	U	320	1470			1
PCB 179	ND	U	267	3680			1
PCB 184	ND	U	236	3680			1
PCB 176	ND	U	274	3680			1
PCB 186	ND	U	257	3680			1
PCB 178	ND	U	379	3680			1
PCB 175	ND	U	357	3680			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	311	3680			1
PCB 182	ND	U	352	3680			1
PCB 183	ND	U	321	7350			1
PCB 185	ND	U	311	7350			1
PCB 174	511**JK**		345	3680	1.36	1.133	1
PCB 177	ND	U	363	3680			1
PCB 181	ND	U	305	3680			1
PCBs 171 + 173	ND	U	362	7350			1
PCB 172	ND	U	368	3680			1
PCB 192	ND	U	257	3680			1
PCBs 180 + 193	530**JK**		255	7350	1.38	0.912	1
PCB 191	ND	U	262	3680			1
PCB 170	504**JK**		383	3680	0.86	0.940	1
PCB 190	ND	U	260	3680			1
PCB 189	ND	U	237	1470			1
PCB 202	ND	U	262	1470			1
PCB 201	ND	U	231	3680			1
PCB 204	ND	U	239	3680			1
PCB 197	ND	U	217	7350			1
PCB 200	ND	U	241	7350			1
PCBs 198 + 199	ND	U	332	7350			1
PCB 196	ND	U	343	3680			1
PCB 203	ND	U	288	3680			1
PCB 195	ND	U	361	3680			1
PCB 194	ND	U	348	3680			1
PCB 205	ND	U	298	1470			1
PCB 208	ND	U	271	1470			1
PCB 207	ND	U	305	3680			1
PCB 206	ND	U	408	1470			1
PCB 209	ND	U	330	1470			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	230	3680			1
Total DiCB	ND	U	94.2	7350			1
Total TriCB	ND	U	264	3680			1
Total TetraCB	1090**J**		148	14700			1
Total PentaCB	446**J**		297	14700			1
Total HexaCB	952**J**		185	14700			1
Total HeptaCB	1540**J**		236	7350			1
Total OctaCB	ND	U	217	7350			1
Total NonaCB	ND	U	271	3680			1
Total PCBs	4030**J**		94.2	14700			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	Percent
Lab Code:	EQ1500022-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 09:58
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238753	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1375.365	69		5-145	3.35	0.750
PCB 3L	2000	1347.198	67		5-145	3.29	0.876
PCB 4L	2000	1454.963	73		5-145	1.56	0.892
PCB 15L	2000	1353.969	68		5-145	1.59	1.232
PCB 19L	2000	1504.976	75		5-145	1.03	1.073
PCB 37L	2000	1381.685	69		5-145	1.01	1.089
PCB 54L	2000	1772.155	89		5-145	0.78	0.831
PCB 81L	2000	1308.071	65		10-145	0.80	1.348
PCB 77L	2000	1370.404	69		10-145	0.79	1.373
PCB 104L	2000	1781.002	89		10-145	1.55	0.821
PCB 123L	2000	1391.299	70		10-145	1.60	1.144
PCB 118L	2000	1383.043	69		10-145	1.59	1.153
PCB 114L	2000	1408.965	70		10-145	1.68	1.170
PCB 105L	2000	1416.673	71		10-145	1.66	1.194
PCB 126L	2000	1338.901	67		10-145	1.63	1.289
PCB 155L	2000	2210.082	111		10-145	1.20	0.789
PCB 167L	2000	1622.047	81		10-145	1.29	1.073
PCBs 156L + 157L	4000	3301.864	83		10-145	1.24	1.106
PCB 169L	2000	1711.877	86		10-145	1.26	1.185
PCB 188L	2000	1571.556	79		10-145	1.10	0.718
PCB 189L	2000	1564.958	78		10-145	1.07	0.960
PCB 202L	2000	1591.759	80		10-145	0.94	0.821
PCB 205L	2000	1511.671	76		10-145	0.90	1.009
PCB 208L	2000	1630.997	82		10-145	0.79	0.947
PCB 206L	2000	1611.499	81		10-145	0.80	1.042
PCB 209L	2000	1602.715	80		10-145	1.16	1.070
PCB 28L	2000	1512.979	76		5-145	0.99	0.929
PCB 111L	2000	1567.936	78		10-145	1.57	1.079
PCB 178L	2000	1826.320	91		10-145	1.04	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	8190	13500			1
PCB 2	ND	U	11800	13500			1
PCB 3	ND	U	12000	13500			1
PCB 4	ND	U	4250	13500	-		1
PCB 10	ND	U	3510	33800	-		1
PCB 9	ND	U	3740	13500	-		1
PCB 7	ND	U	2990	13500	-		1
PCB 6	ND	U	3380	13500	-		1
PCB 5	ND	U	3330	13500	-		1
PCB 8	ND	U	2970	33800	-		1
PCB 14	ND	U	3400	13500	-		1
PCB 11	ND	U	3780	67600	-		1
PCBs 12 + 13	ND	U	3450	33800	-		1
PCB 15	ND	U	4570	13500	-		1
PCB 19	ND	U	15200	15200			1
PCB 18	ND	U	13600	33800			1
PCB 30	ND	U	19300	33800			1
PCB 17	ND	U	20000	20000			1
PCB 27	ND	U	14200	14200			1
PCB 24	ND	U	13100	13500			1
PCB 16	ND	U	22800	22800			1
PCB 32	ND	U	13300	13500			1
PCB 34	ND	U	14800	14800			1
PCB 23	ND	U	12000	13500			1
PCBs 26 + 29	ND	U	12700	33800			1
PCB 25	ND	U	9890	13500			1
PCB 31	ND	U	12500	33800			1
PCBs 20 + 28	ND	U	13800	33800			1
PCBs 21 + 33	ND	U	11000	33800			1
PCB 22	ND	U	13000	13500			1
PCB 36	ND	U	12000	13500			1
PCB 39	ND	U	11100	13500			1
PCB 38	ND	U	13500	13500			1
PCB 35	ND	U	14500	14500			1
PCB 37	ND	U	19500	19500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	ND	U	6690	13500			1
PCBs 50 + 53	ND	U	11900	67600			1
PCBs 45 + 51	ND	U	11700	33800			1
PCB 46	ND	U	14000	14000			1
PCB 52	ND	U	12200	33800			1
PCBs 43 + 73	ND	U	10700	33800			1
PCB 69	ND	U	7160	67600			1
PCB 49	ND	U	10400	67600			1
PCB 48	ND	U	10800	33800			1
PCBs 44 + 47 + 65	ND	U	10200	67600			1
PCBs 59 + 62 + 75	ND	U	12700	67600			1
PCB 42	ND	U	9660	67600			1
PCB 41	ND	U	14800	67600			1
PCBs 40 + 71	ND	U	11600	67600			1
PCB 64	ND	U	6090	33800			1
PCB 72	ND	U	9060	33800			1
PCB 68	ND	U	8480	33800			1
PCB 57	ND	U	9910	33800			1
PCB 58	ND	U	9460	33800			1
PCB 67	ND	U	8400	33800			1
PCB 63	ND	U	9510	33800			1
PCB 61	ND	U	9490	135000			1
PCBs 70 + 74 + 76	ND	U	8250	135000			1
PCB 66	ND	U	10200	33800			1
PCB 55	ND	U	10600	33800			1
PCB 56	ND	U	11500	33800			1
PCB 60	ND	U	10300	33800			1
PCB 80	ND	U	9290	33800			1
PCB 79	ND	U	9970	33800			1
PCB 78	ND	U	12100	33800			1
PCB 81	ND	U	14000	14000			1
PCB 77	ND	U	13200	13500			1
PCB 104	ND	U	9670	13500			1
PCB 96	ND	U	10200	33800			1
PCB 103	ND	U	12000	33800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	13800	33800			1
PCBs 95 + 100	ND	U	12500	135000			1
PCB 93	ND	U	14500	135000			1
PCBs 98 + 102	ND	U	12000	135000			1
PCB 88	ND	U	14600	33800			1
PCB 91	ND	U	11800	33800			1
PCB 84	ND	U	16500	16500			1
PCB 89	ND	U	18300	33800			1
PCB 121	ND	U	8420	33800			1
PCB 92	ND	U	14300	33800			1
PCBs 90 + 101 + 113	ND	U	12000	135000			1
PCBs 83 + 99	ND	U	14000	67600			1
PCB 112	ND	U	10100	33800			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	ND	U	11600	135000			1
PCBs 117 + 116	ND	U	10500	67600			1
PCB 85	ND	U	14000	67600			1
PCBs 110 + 115	ND	U	8490	67600			1
PCB 82	ND	U	21700	33800			1
PCB 111	ND	U	8960	33800			1
PCB 120	ND	U	9970	33800			1
PCBs 108 + 124	ND	U	10300	67600			1
PCB 107	ND	U	11200	33800			1
PCB 123	ND	U	11400	13500			1
PCB 106	ND	U	10600	33800			1
PCB 118	ND	U	12000	13500			1
PCB 122	ND	U	12000	33800			1
PCB 114	ND	U	11600	13500			1
PCB 105	ND	U	12600	13500			1
PCB 127	ND	U	12900	33800			1
PCB 126	ND	U	13700	13700			1
PCB 155	ND	U	7890	13500			1
PCB 152	ND	U	11000	33800			1
PCB 150	ND	U	9940	33800			1
PCB 136	ND	U	11000	33800			1
PCB 145	ND	U	9590	33800			1
PCB 148	ND	U	15300	33800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	ND	U	16800	67600			1
PCBs 135 + 154	ND	U	13100	67600			1
PCB 144	ND	U	14900	33800			1
PCBs 147 + 149	ND	U	11600	67600			1
PCB 134	ND	U	10700	67600			1
PCB 143	ND	U	14100	67600			1
PCBs 139 + 140	ND	U	11600	67600			1
PCB 131	ND	U	11500	33800			1
PCB 142	ND	U	14600	33800			1
PCB 132	ND	U	13400	33800			1
PCB 133	ND	U	14300	33800			1
PCB 165	ND	U	9590	33800			1
PCB 146	ND	U	11000	33800			1
PCB 161	ND	U	10100	33800			1
PCBs 153 + 168	28500**J**		10200	67600	1.23	0.966	1
PCB 141	ND	U	12900	33800			1
PCB 130	ND	U	15000	33800			1
PCB 137	ND	U	12100	33800			1
PCB 164	ND	U	9730	33800			1
PCBs 129 + 138 + 163	ND	U	14400	135000			1
PCB 160	ND	U	5900	135000			1
PCB 158	ND	U	9090	33800			1
PCB 166	ND	U	9660	67600			1
PCB 128	ND	U	13200	67600			1
PCB 159	ND	U	14400	33800			1
PCB 162	ND	U	13500	33800			1
PCB 167	ND	U	12500	13500			1
PCBs 156 + 157	ND	U	24000	27000			1
PCB 169	ND	U	14000	14000			1
PCB 188	ND	U	7440	13500			1
PCB 179	ND	U	6480	33800			1
PCB 184	ND	U	5860	33800			1
PCB 176	ND	U	6430	33800			1
PCB 186	ND	U	6210	33800			1
PCB 178	ND	U	9420	33800			1
PCB 175	ND	U	8920	33800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	7540	33800			1
PCB 182	ND	U	8190	33800			1
PCB 183	ND	U	14100	67600			1
PCB 185	ND	U	13900	67600			1
PCB 174	ND	U	13800	33800			1
PCB 177	ND	U	15100	33800			1
PCB 181	ND	U	13000	33800			1
PCBs 171 + 173	ND	U	16200	67600			1
PCB 172	ND	U	15800	33800			1
PCB 192	ND	U	11500	33800			1
PCBs 180 + 193	ND	U	11300	67600			1
PCB 191	ND	U	12100	33800			1
PCB 170	ND	U	17100	33800			1
PCB 190	ND	U	10600	33800			1
PCB 189	ND	U	11500	13500			1
PCB 202	ND	U	11200	13500			1
PCB 201	ND	U	10800	33800			1
PCB 204	ND	U	10800	33800			1
PCB 197	ND	U	10200	67600			1
PCB 200	ND	U	11100	67600			1
PCBs 198 + 199	ND	U	15100	67600			1
PCB 196	ND	U	15700	33800			1
PCB 203	ND	U	13500	33800			1
PCB 195	ND	U	16000	33800			1
PCB 194	ND	U	16100	33800			1
PCB 205	ND	U	14100	14100			1
PCB 208	ND	U	10300	13500			1
PCB 207	ND	U	11600	33800			1
PCB 206	ND	U	17000	17000			1
PCB 209	ND	U	16500	16500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	ND	U	8190	33800			1
Total DiCB	ND	U	2970	67600			1
Total TriCB	ND	U	9890	33800			1
Total TetraCB	ND	U	6090	135000			1
Total PentaCB	ND	U	8420	135000			1
Total HexaCB	28500**J**		5900	135000			1
Total HeptaCB	ND	U	5860	67600			1
Total OctaCB	ND	U	10200	67600			1
Total NonaCB	ND	U	10300	33800			1
Total PCBs	28500**J**		2970	135000			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	Percent
Lab Code:	EQ1500023-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/22/15 16:35
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238855	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1355.120	68		5-145	3.09	0.751
PCB 3L	2000	1226.238	61		5-145	3.07	0.877
PCB 4L	2000	1387.376	69		5-145	1.65	0.892
PCB 15L	2000	1162.121	58		5-145	1.57	1.233
PCB 19L	2000	1404.713	70		5-145	1.05	1.071
PCB 37L	2000	1166.076	58		5-145	1.05	1.090
PCB 54L	2000	1737.675	87		5-145	0.81	0.831
PCB 81L	2000	1128.937	56		10-145	0.76	1.349
PCB 77L	2000	1271.478	64		10-145	0.77	1.373
PCB 104L	2000	1569.360	78		10-145	1.64	0.820
PCB 123L	2000	1252.828	63		10-145	1.56	1.144
PCB 118L	2000	1300.065	65		10-145	1.59	1.154
PCB 114L	2000	1333.769	67		10-145	1.44	1.171
PCB 105L	2000	1295.222	65		10-145	1.68	1.195
PCB 126L	2000	1190.349	60		10-145	1.65	1.290
PCB 155L	2000	1942.724	97		10-145	1.21	0.789
PCB 167L	2000	1304.381	65		10-145	1.29	1.072
PCBs 156L + 157L	4000	2747.910	69		10-145	1.26	1.105
PCB 169L	2000	1382.640	69		10-145	1.40	1.185
PCB 188L	2000	1491.687	75		10-145	1.02	0.718
PCB 189L	2000	1400.136	70		10-145	1.11	0.961
PCB 202L	2000	1460.329	73		10-145	0.91	0.821
PCB 205L	2000	1343.334	67		10-145	0.90	1.009
PCB 208L	2000	1673.881	84		10-145	0.84	0.948
PCB 206L	2000	1438.991	72		10-145	0.80	1.042
PCB 209L	2000	1446.729	72		10-145	1.23	1.071
PCB 28L	2000	1501.068	75		5-145	1.10	0.930
PCB 111L	2000	1433.635	72		10-145	1.61	1.079
PCB 178L	2000	1778.449	89		10-145	1.10	1.008

Accuracy & Precision

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ALS Group USA, Corp.
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QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Analyzed:**	11/19/14 - 11/20/14
Sample Matrix:	PE	**Date Extracted:**	10/28/14

Duplicate Lab Control Sample Summary
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Units:**	ng/Kg
Prep Method:	Method	**Basis:**	As Received
		Analysis Lot:	422327

	Lab Control Sample EQ1400690-02			Duplicate Lab Control Sample EQ1400690-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
PCB 1	3540	3230	110	3760	3230	116	60-135	6	50
PCB 3	2970	3230	92	3170	3230	98	60-135	7	50
PCB 15	3560	3230	110	3810	3230	118	60-135	7	50
PCB 4	17100	3230	531 *	19200	3230	596 *	60-135	12	50
PCB 19	17100	3230	529 *	17700	3230	548 *	60-135	4	50
PCB 37	3010	3230	93	3220	3230	100	60-135	7	50
PCB 54	12700	3230	394 *	13700	3230	426 *	60-135	8	50
PCB 77	2910	3230	90	3000	3230	93	60-135	3	50
PCB 81	3050	3230	95	3080	3230	95	60-135	<1	50
PCB 104	3280	3230	102	3200	3230	99	60-135	2	50
PCB 105	3080	3230	95	3400	3230	105	60-135	10	50
PCB 114	3120	3230	97	3360	3230	104	60-135	7	50
PCB 118	3700	3230	115	4210	3230	130	60-135	13	50
PCB 123	3090	3230	96	3460	3230	107	60-135	11	50
PCB 126	3000	3230	93	3240	3230	100	60-135	8	50
PCB 155	3050	3230	94	2930	3230	91	60-135	4	50
PCB 167	3440	3230	107	3520	3230	109	60-135	2	50
PCB 169	2890	3230	90	3410	3230	106	60-135	17	50
PCBs 156 + 157	6950	6450	108	7540	6450	117	60-135	8	50
PCB 188	3110	3230	96	3200	3230	99	60-135	3	50
PCB 189	3020	3230	94	3180	3230	99	60-135	5	50
PCB 202	3200	3230	99	3320	3230	103	60-135	4	50
PCB 205	3040	3230	94	3130	3230	97	60-135	3	50
PCB 206	3650	3230	113	3900	3230	121	60-135	7	50
PCB 208	3110	3230	96	3000	3230	93	60-135	4	50
PCB 209	2720	3230	84	2640	3230	82	60-135	3	50

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1400690-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/19/14 20:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151624	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151615

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	3540		20.4	64.5	3.31	1.000	1
PCB 3	2970		25.3	64.5	3.20	1.000	1
PCB 4	17100		50.8	64.5	-	1.002	1
PCB 15	3560		61.0	64.5	-	1.001	1
PCB 19	17100		67.2	67.2	0.97	1.001	1
PCB 37	3010		76.5	76.5	1.05	1.001	1
PCB 54	12700		40.5	64.5	0.75	1.001	1
PCB 81	3050		85.0	85.0	0.79	1.000	1
PCB 77	2910		86.5	86.5	0.72	1.001	1
PCB 104	3280		58.7	64.5	1.69	1.001	1
PCB 123	3090		127	127	1.51	1.001	1
PCB 118	3700		116	116	1.61	1.000	1
PCB 114	3120		125	125	1.67	1.001	1
PCB 105	3080		121	121	1.55	1.001	1
PCB 126	3000		106	106	1.48	1.001	1
PCB 155	3050		58.2	64.5	1.25	1.001	1
PCB 167	3440		70.3	70.3	1.27	1.001	1
PCBs 156 + 157	6950		108	129	1.25	1.000	1
PCB 169	2890		68.0	68.0	1.24	1.001	1
PCB 188	3110		61.8	64.5	0.91	1.000	1
PCB 189	3020		61.9	64.5	0.94	1.000	1
PCB 202	3200		45.3	64.5	0.86	1.001	1
PCB 205	3040		43.4	64.5	0.82	1.001	1
PCB 208	3110		62.8	64.5	0.74	1.001	1
PCB 206	3650		70.0	70.0	0.77	1.000	1
PCB 209	2720		49.8	64.5	1.16	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1400690-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/19/14 20:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151624	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151615

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	6510		20.4	161			1
Total DiCB	20700		50.8	323			1
Total TriCB	20100		67.2	161			1
Total TetraCB	18700		40.5	645			1
Total PentaCB	19300		58.7	645			1
Total HexaCB	16300		58.2	645			1
Total HeptaCB	6130		61.8	323			1
Total OctaCB	6240		43.4	323			1
Total NonaCB	6760		62.8	161			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1400690-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/19/14 20:47
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151624	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151615

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	288.170	14		5-145	3.14	0.745
PCB 3L	2000	312.147	16		5-145	3.09	0.872
PCB 4L	2000	301.040	15		5-145	1.61	0.887
PCB 15L	2000	343.266	17		5-145	1.57	1.238
PCB 19L	2000	311.044	16		5-145	0.88	1.072
PCB 37L	2000	368.414	18		5-145	1.09	1.089
PCB 54L	2000	350.412	18		5-145	0.82	0.824
PCB 81L	2000	331.451	17		10-145	0.81	1.357
PCB 77L	2000	325.064	16		10-145	0.79	1.381
PCB 104L	2000	355.575	18		10-145	1.59	0.815
PCB 123L	2000	354.304	18		10-145	1.55	1.146
PCB 118L	2000	353.309	18		10-145	1.55	1.157
PCB 114L	2000	338.319	17		10-145	1.54	1.174
PCB 105L	2000	353.698	18		10-145	1.55	1.196
PCB 126L	2000	359.687	18		10-145	1.57	1.293
PCB 155L	2000	421.671	21		10-145	1.22	0.787
PCB 167L	2000	403.370	20		10-145	1.25	1.075
PCBs 156L + 157L	4000	856.557	21		10-145	1.30	1.105
PCB 169L	2000	422.790	21		10-145	1.23	1.187
PCB 188L	2000	295.766	15		10-145	1.09	0.715
PCB 189L	2000	363.278	18		10-145	1.05	0.960
PCB 202L	2000	325.710	16		10-145	0.85	0.820
PCB 205L	2000	408.519	20		10-145	0.88	1.009
PCB 208L	2000	350.845	18		10-145	0.76	0.948
PCB 206L	2000	408.042	20		10-145	0.74	1.041
PCB 209L	2000	565.832	28		10-145	1.18	1.071
PCB 28L	2000	372.236	19		5-145	1.06	0.927
PCB 111L	2000	315.457	16		10-145	1.51	1.082
PCB 178L	2000	370.213	19		10-145	1.08	1.010

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1400690-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/20/14 12:29
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151634	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151632

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	3760		63.0	64.5	3.10	1.000	1
PCB 3	3170		70.2	70.2	3.21	1.001	1
PCB 4	19200		106	106	-	1.001	1
PCB 15	3810		88.0	88.0	-	1.001	1
PCB 19	17700		131	131	0.97	1.001	1
PCB 37	3220		165	165	1.09	1.001	1
PCB 54	13700		87.3	87.3	0.74	1.002	1
PCB 81	3080		114	114	0.78	1.001	1
PCB 77	3000		117	117	0.86	1.000	1
PCB 104	3200		133	133	1.71	1.001	1
PCB 123	3460		171	171	1.72	1.000	1
PCB 118	4210		161	161	1.74	1.000	1
PCB 114	3360		182	182	1.62	1.000	1
PCB 105	3400		162	162	1.45	1.001	1
PCB 126	3240		157	157	1.47	1.001	1
PCB 155	2930		85.6	85.6	1.18	1.001	1
PCB 167	3520		154	154	1.21	1.001	1
PCBs 156 + 157	7540		267	267	1.19	1.000	1
PCB 169	3410		166	166	1.36	1.001	1
PCB 188	3200		117	117	1.07	1.001	1
PCB 189	3180		112	112	0.93	1.000	1
PCB 202	3320		115	115	0.84	1.001	1
PCB 205	3130		117	117	0.76	1.000	1
PCB 208	3000		114	114	0.67	1.001	1
PCB 206	3900		185	185	0.73	1.001	1
PCB 209	2640		64.3	64.5	1.24	1.001	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1400690-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/20/14 12:29
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151634	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151632

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	6930		63.0	161			1
Total DiCB	23000		88.0	323			1
Total TriCB	20900		131	161			1
Total TetraCB	19800		87.3	645			1
Total PentaCB	20900		133	645			1
Total HexaCB	17400		85.6	645			1
Total HeptaCB	6380		112	323			1
Total OctaCB	6460		115	323			1
Total NonaCB	6910		114	161			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1400690-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	11/20/14 12:29
Prep Method:	Method	**Date Extracted:**	10/28/14
Sample Amount:	0.310g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-Octyl
Data File Name:	U151634	**Blank File Name:**	U151536
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U151632

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	273.495	14		5-145	3.32	0.744
PCB 3L	2000	289.614	14		5-145	3.47	0.871
PCB 4L	2000	332.502	17		5-145	1.71	0.887
PCB 15L	2000	327.070	16		5-145	1.60	1.237
PCB 19L	2000	353.122	18		5-145	1.06	1.071
PCB 37L	2000	337.209	17		5-145	0.94	1.089
PCB 54L	2000	385.466	19		5-145	0.81	0.824
PCB 81L	2000	309.790	15		10-145	0.78	1.357
PCB 77L	2000	307.693	15		10-145	0.80	1.381
PCB 104L	2000	398.270	20		10-145	1.62	0.815
PCB 123L	2000	342.445	17		10-145	1.58	1.147
PCB 118L	2000	338.886	17		10-145	1.62	1.157
PCB 114L	2000	326.860	16		10-145	1.46	1.174
PCB 105L	2000	345.556	17		10-145	1.55	1.196
PCB 126L	2000	346.364	17		10-145	1.53	1.294
PCB 155L	2000	463.625	23		10-145	1.31	0.788
PCB 167L	2000	414.449	21		10-145	1.26	1.075
PCBs 156L + 157L	4000	808.634	20		10-145	1.31	1.105
PCB 169L	2000	401.012	20		10-145	1.21	1.187
PCB 188L	2000	316.564	16		10-145	1.08	0.715
PCB 189L	2000	373.458	19		10-145	1.08	0.960
PCB 202L	2000	346.679	17		10-145	0.86	0.820
PCB 205L	2000	429.218	21		10-145	0.87	1.009
PCB 208L	2000	393.346	20		10-145	0.79	0.948
PCB 206L	2000	442.099	22		10-145	0.75	1.041
PCB 209L	2000	641.244	32		10-145	1.13	1.071
PCB 28L	2000	360.492	18		5-145	0.96	0.927
PCB 111L	2000	328.251	16		10-145	1.64	1.082
PCB 178L	2000	381.380	19		10-145	1.04	1.009

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QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Analyzed:**	01/11/15
Sample Matrix:	PE	**Date Extracted:**	01/08/15

Duplicate Lab Control Sample Summary
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Units:**	ng/Kg
Prep Method:	Method	**Basis:**	As Received
		Analysis Lot:	428992

	Lab Control Sample EQ1500022-02			Duplicate Lab Control Sample EQ1500022-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
PCB 1	72300	73500	98	69500	73500	95	60-135	4	50
PCB 3	70700	73500	96	70100	73500	95	60-135	<1	50
PCB 15	74000	73500	101	74500	73500	101	60-135	<1	50
PCB 4	69400	73500	94	70500	73500	96	60-135	2	50
PCB 19	71900	73500	98	72400	73500	99	60-135	<1	50
PCB 37	71700	73500	98	75400	73500	103	60-135	5	50
PCB 54	71500	73500	97	71400	73500	97	60-135	<1	50
PCB 77	70300	73500	96	71100	73500	97	60-135	1	50
PCB 81	73400	73500	100	77300	73500	105	60-135	5	50
PCB 104	69500	73500	94	69900	73500	95	60-135	<1	50
PCB 105	71000	73500	97	72400	73500	98	60-135	2	50
PCB 114	72000	73500	98	73700	73500	100	60-135	2	50
PCB 118	76900	73500	105	79200	73500	108	60-135	3	50
PCB 123	73900	73500	101	74600	73500	101	60-135	<1	50
PCB 126	73400	73500	100	71000	73500	97	60-135	3	50
PCB 155	67500	73500	92	69000	73500	94	60-135	2	50
PCB 167	71000	73500	97	72600	73500	99	60-135	2	50
PCB 169	68900	73500	94	70400	73500	96	60-135	2	50
PCBs 156 + 157	148000	147000	101	146000	147000	100	60-135	1	50
PCB 188	76400	73500	104	77500	73500	105	60-135	1	50
PCB 189	76800	73500	104	75800	73500	103	60-135	1	50
PCB 202	74000	73500	101	74000	73500	101	60-135	<1	50
PCB 205	82400	73500	112	81700	73500	111	60-135	<1	50
PCB 206	79400	73500	108	79100	73500	108	60-135	<1	50
PCB 208	70400	73500	96	73700	73500	100	60-135	5	50
PCB 209	76100	73500	104	76700	73500	104	60-135	<1	50

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500022-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 17:27
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238760	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	72300		172	1470	3.07	1.001	1
PCB 3	70700		225	1470	3.14	1.000	1
PCB 4	69400		117	1470	-	1.001	1
PCB 15	74000		86.0	1470	-	1.001	1
PCB 19	71900		335	1470	1.05	1.001	1
PCB 37	71700		287	1470	1.04	1.000	1
PCB 54	71500		113	1470	0.75	1.001	1
PCB 81	73400		197	1470	0.73	1.000	1
PCB 77	70300		202	1470	0.80	1.000	1
PCB 104	69500		189	1470	1.57	1.001	1
PCB 123	73900		566	1470	1.59	1.000	1
PCB 118	76900		556	1470	1.53	1.000	1
PCB 114	72000		554	1470	1.56	1.000	1
PCB 105	71000		541	1470	1.53	1.000	1
PCB 126	73400		566	1470	1.59	1.001	1
PCB 155	67500		156	1470	1.30	1.001	1
PCB 167	71000		185	1470	1.15	1.000	1
PCBs 156 + 157	148000		364	2940	1.20	1.001	1
PCB 169	68900		186	1470	1.17	1.000	1
PCB 188	76400		121	1470	1.09	1.000	1
PCB 189	76800		262	1470	1.06	1.000	1
PCB 202	74000		179	1470	0.94	1.000	1
PCB 205	82400		203	1470	0.89	1.000	1
PCB 208	70400		215	1470	0.74	1.000	1
PCB 206	79400		400	1470	0.84	1.000	1
PCB 209	76100		199	1470	1.19	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500022-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 17:27
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238760	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	143000		172	3680			1
Total DiCB	143000		86.0	7350			1
Total TriCB	144000		287	3680			1
Total TetraCB	215000		113	14700			1
Total PentaCB	437000		189	14700			1
Total HexaCB	356000		156	14700			1
Total HeptaCB	153000		121	7350			1
Total OctaCB	156000		179	7350			1
Total NonaCB	150000		215	3680			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500022-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 17:27
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238760	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1362.767	68		5-145	3.15	0.750
PCB 3L	2000	1337.719	67		5-145	3.37	0.876
PCB 4L	2000	1469.116	73		5-145	1.51	0.891
PCB 15L	2000	1387.381	69		5-145	1.59	1.232
PCB 19L	2000	1567.568	78		5-145	1.04	1.072
PCB 37L	2000	1462.826	73		5-145	0.97	1.089
PCB 54L	2000	1845.957	92		5-145	0.81	0.831
PCB 81L	2000	1351.925	68		10-145	0.79	1.347
PCB 77L	2000	1444.759	72		10-145	0.79	1.372
PCB 104L	2000	1871.217	94		10-145	1.53	0.821
PCB 123L	2000	1387.321	69		10-145	1.58	1.144
PCB 118L	2000	1425.659	71		10-145	1.58	1.154
PCB 114L	2000	1423.230	71		10-145	1.57	1.171
PCB 105L	2000	1478.475	74		10-145	1.61	1.195
PCB 126L	2000	1325.047	66		10-145	1.60	1.289
PCB 155L	2000	2263.262	113		10-145	1.22	0.789
PCB 167L	2000	1614.271	81		10-145	1.26	1.073
PCBs 156L + 157L	4000	3243.842	81		10-145	1.28	1.102
PCB 169L	2000	1718.170	86		10-145	1.29	1.185
PCB 188L	2000	1660.300	83		10-145	1.03	0.718
PCB 189L	2000	1531.730	77		10-145	1.05	0.960
PCB 202L	2000	1626.365	81		10-145	0.94	0.821
PCB 205L	2000	1491.570	75		10-145	0.88	1.009
PCB 208L	2000	1665.982	83		10-145	0.76	0.948
PCB 206L	2000	1642.674	82		10-145	0.82	1.042
PCB 209L	2000	1652.486	83		10-145	1.19	1.070
PCB 28L	2000	1575.214	79		5-145	0.98	0.929
PCB 111L	2000	1558.522	78		10-145	1.58	1.080
PCB 178L	2000	1844.169	92		10-145	1.06	1.007

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500022-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 18:32
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238761	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	69500		187	1470	3.12	1.001	1
PCB 3	70100		237	1470	3.12	1.001	1
PCB 4	70500		92.9	1470	-	1.001	1
PCB 15	74500		126	1470	-	1.001	1
PCB 19	72400		308	1470	1.02	1.001	1
PCB 37	75400		266	1470	1.05	1.000	1
PCB 54	71400		158	1470	0.72	1.001	1
PCB 81	77300		212	1470	0.77	1.000	1
PCB 77	71100		209	1470	0.78	1.000	1
PCB 104	69900		186	1470	1.50	1.001	1
PCB 123	74600		735	1470	1.60	1.000	1
PCB 118	79200		713	1470	1.59	1.001	1
PCB 114	73700		734	1470	1.60	1.000	1
PCB 105	72400		721	1470	1.55	1.000	1
PCB 126	71000		704	1470	1.52	1.001	1
PCB 155	69000		120	1470	1.20	1.001	1
PCB 167	72600		221	1470	1.13	1.001	1
PCBs 156 + 157	146000		413	2940	1.19	0.998	1
PCB 169	70400		220	1470	1.17	1.000	1
PCB 188	77500		152	1470	1.05	1.000	1
PCB 189	75800		187	1470	1.02	1.001	1
PCB 202	74000		152	1470	0.91	1.000	1
PCB 205	81700		169	1470	0.98	1.000	1
PCB 208	73700		220	1470	0.76	1.000	1
PCB 206	79100		369	1470	0.82	1.000	1
PCB 209	76700		232	1470	1.26	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500022-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 18:32
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238761	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	140000		187	3680			1
Total DiCB	145000		92.9	7350			1
Total TriCB	148000		266	3680			1
Total TetraCB	220000		158	14700			1
Total PentaCB	441000		186	14700			1
Total HexaCB	358000		120	14700			1
Total HeptaCB	153000		152	7350			1
Total OctaCB	156000		152	7350			1
Total NonaCB	153000		220	3680			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500022-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/11/15 18:32
Prep Method:	Method	**Date Extracted:**	1/8/15
Sample Amount:	13.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238761	**Blank File Name:**	U238753
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238751

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1327.202	66		5-145	3.22	0.750
PCB 3L	2000	1316.168	66		5-145	3.19	0.875
PCB 4L	2000	1398.933	70		5-145	1.56	0.891
PCB 15L	2000	1319.665	66		5-145	1.56	1.232
PCB 19L	2000	1476.753	74		5-145	1.01	1.072
PCB 37L	2000	1323.563	66		5-145	1.01	1.089
PCB 54L	2000	1684.232	84		5-145	0.76	0.831
PCB 81L	2000	1202.308	60		10-145	0.79	1.347
PCB 77L	2000	1317.487	66		10-145	0.80	1.372
PCB 104L	2000	1739.555	87		10-145	1.66	0.821
PCB 123L	2000	1288.385	64		10-145	1.58	1.144
PCB 118L	2000	1328.985	66		10-145	1.58	1.154
PCB 114L	2000	1333.015	67		10-145	1.63	1.171
PCB 105L	2000	1369.109	68		10-145	1.54	1.195
PCB 126L	2000	1276.077	64		10-145	1.57	1.289
PCB 155L	2000	2026.792	101		10-145	1.34	0.789
PCB 167L	2000	1510.712	76		10-145	1.27	1.072
PCBs 156L + 157L	4000	3120.388	78		10-145	1.26	1.105
PCB 169L	2000	1636.123	82		10-145	1.27	1.185
PCB 188L	2000	1533.182	77		10-145	1.04	0.718
PCB 189L	2000	1493.457	75		10-145	1.02	0.960
PCB 202L	2000	1507.126	75		10-145	0.93	0.821
PCB 205L	2000	1419.539	71		10-145	0.93	1.009
PCB 208L	2000	1529.665	76		10-145	0.78	0.948
PCB 206L	2000	1563.738	78		10-145	0.80	1.042
PCB 209L	2000	1607.484	80		10-145	1.17	1.070
PCB 28L	2000	1403.698	70		5-145	1.04	0.929
PCB 111L	2000	1343.630	67		10-145	1.62	1.079
PCB 178L	2000	1651.357	83		10-145	1.04	1.007

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QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Analyzed:**	01/23/15
Sample Matrix:	PE	**Date Extracted:**	01/19/15

Duplicate Lab Control Sample Summary
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Units:**	ng/Kg
Prep Method:	Method	**Basis:**	As Received
		Analysis Lot:	431192

	Lab Control Sample EQ1500023-02			Duplicate Lab Control Sample EQ1500023-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
PCB 1	604000	676000	89	652000	676000	96	60-135	8	50
PCB 3	615000	676000	91	581000	676000	86	60-135	6	50
PCB 15	653000	676000	97	746000	676000	110	60-135	13	50
PCB 4	617000	676000	91	642000	676000	95	60-135	4	50
PCB 19	661000	676000	98	660000	676000	98	60-135	<1	50
PCB 37	758000	676000	112	786000	676000	116	60-135	4	50
PCB 54	656000	676000	97	699000	676000	103	60-135	6	50
PCB 77	628000	676000	93	626000	676000	93	60-135	<1	50
PCB 81	683000	676000	101	655000	676000	97	60-135	4	50
PCB 104	573000	676000	85	629000	676000	93	60-135	9	50
PCB 105	680000	676000	101	699000	676000	103	60-135	3	50
PCB 114	648000	676000	96	742000	676000	110	60-135	14	50
PCB 118	756000	676000	112	725000	676000	107	60-135	4	50
PCB 123	651000	676000	96	726000	676000	107	60-135	11	50
PCB 126	644000	676000	95	664000	676000	98	60-135	3	50
PCB 155	596000	676000	88	608000	676000	90	60-135	2	50
PCB 167	690000	676000	102	617000	676000	91	60-135	11	50
PCB 169	672000	676000	99	713000	676000	105	60-135	6	50
PCBs 156 + 157	1370000	1350000	102	1550000	1350000	115	60-135	12	50
PCB 188	679000	676000	100	696000	676000	103	60-135	2	50
PCB 189	715000	676000	106	696000	676000	103	60-135	3	50
PCB 202	666000	676000	99	723000	676000	107	60-135	8	50
PCB 205	738000	676000	109	836000	676000	124	60-135	12	50
PCB 206	714000	676000	106	742000	676000	110	60-135	4	50
PCB 208	613000	676000	91	611000	676000	90	60-135	<1	50
PCB 209	716000	676000	106	711000	676000	105	60-135	<1	50

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500023-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 00:05
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238862	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	604000		4140	13500	3.10	1.001	1
PCB 3	615000		6850	13500	3.11	1.001	1
PCB 4	617000		2930	13500	-	1.001	1
PCB 15	653000		4250	13500	-	1.001	1
PCB 19	661000		12500	13500	1.07	1.002	1
PCB 37	758000		14100	14100	0.95	1.001	1
PCB 54	656000		5640	13500	0.78	1.001	1
PCB 81	683000		10500	13500	0.75	1.001	1
PCB 77	628000		11100	13500	0.74	1.000	1
PCB 104	573000		6800	13500	1.61	1.001	1
PCB 123	651000		24000	24000	1.58	1.001	1
PCB 118	756000		23500	23500	1.52	1.000	1
PCB 114	648000		24200	24200	1.44	1.000	1
PCB 105	680000		24700	24700	1.68	1.001	1
PCB 126	644000		25600	25600	1.68	1.000	1
PCB 155	596000		6680	13500	1.22	1.001	1
PCB 167	690000		11000	13500	1.15	1.000	1
PCBs 156 + 157	1370000		21100	27000	1.28	1.003	1
PCB 169	672000		11800	13500	1.16	1.001	1
PCB 188	679000		7160	13500	1.08	1.001	1
PCB 189	715000		10900	13500	1.06	1.000	1
PCB 202	666000		9200	13500	0.87	1.001	1
PCB 205	738000		11200	13500	0.86	1.001	1
PCB 208	613000		8910	13500	0.79	1.000	1
PCB 206	714000		12800	13500	0.83	1.001	1
PCB 209	716000		9560	13500	1.13	1.000	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500023-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 00:05
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238862	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	1220000		4140	33800			1
Total DiCB	1270000		2930	67600			1
Total TriCB	1420000		12500	33800			1
Total TetraCB	1970000		5640	135000			1
Total PentaCB	3950000		6800	135000			1
Total HexaCB	3330000		6680	135000			1
Total HeptaCB	1390000		7160	67600			1
Total OctaCB	1400000		9200	67600			1
Total NonaCB	1330000		8910	33800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500023-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 00:05
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238862	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1328.567	66		5-145	3.38	0.750
PCB 3L	2000	1222.864	61		5-145	3.43	0.876
PCB 4L	2000	1341.833	67		5-145	1.51	0.891
PCB 15L	2000	1208.589	60		5-145	1.57	1.232
PCB 19L	2000	1331.276	67		5-145	1.11	1.071
PCB 37L	2000	1090.391	55		5-145	1.00	1.090
PCB 54L	2000	1725.520	86		5-145	0.81	0.831
PCB 81L	2000	1224.679	61		10-145	0.77	1.347
PCB 77L	2000	1311.185	66		10-145	0.82	1.372
PCB 104L	2000	1620.632	81		10-145	1.56	0.820
PCB 123L	2000	1282.798	64		10-145	1.43	1.144
PCB 118L	2000	1359.168	68		10-145	1.56	1.154
PCB 114L	2000	1382.599	69		10-145	1.46	1.171
PCB 105L	2000	1351.754	68		10-145	1.62	1.195
PCB 126L	2000	1322.549	66		10-145	1.57	1.290
PCB 155L	2000	1917.454	96		10-145	1.25	0.789
PCB 167L	2000	1456.400	73		10-145	1.29	1.072
PCBs 156L + 157L	4000	2982.245	75		10-145	1.28	1.103
PCB 169L	2000	1507.647	75		10-145	1.25	1.184
PCB 188L	2000	1356.037	68		10-145	1.10	0.718
PCB 189L	2000	1336.288	67		10-145	1.11	0.961
PCB 202L	2000	1386.588	69		10-145	0.92	0.821
PCB 205L	2000	1327.598	66		10-145	0.91	1.009
PCB 208L	2000	1590.835	80		10-145	0.81	0.947
PCB 206L	2000	1407.596	70		10-145	0.77	1.042
PCB 209L	2000	1417.752	71		10-145	1.20	1.071
PCB 28L	2000	1422.371	71		5-145	1.05	0.929
PCB 111L	2000	1463.775	73		10-145	1.58	1.079
PCB 178L	2000	1725.511	86		10-145	1.02	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500023-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 01:10
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238863	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	652000		7230	13500	3.23	1.001	1
PCB 3	581000		14200	14200	3.13	1.001	1
PCB 4	642000		4540	13500	-	1.001	1
PCB 15	746000		6120	13500	-	1.001	1
PCB 19	660000		17600	17600	0.96	1.001	1
PCB 37	786000		19100	19100	1.17	1.001	1
PCB 54	699000		11600	13500	0.85	1.001	1
PCB 81	655000		16200	16200	0.81	1.001	1
PCB 77	626000		16400	16400	0.76	1.001	1
PCB 104	629000		8980	13500	1.48	1.001	1
PCB 123	726000		30600	30600	1.42	1.001	1
PCB 118	725000		31400	31400	1.54	1.000	1
PCB 114	742000		32100	32100	1.38	1.000	1
PCB 105	699000		33000	33000	1.72	1.001	1
PCB 126	664000		35000	35000	1.62	1.000	1
PCB 155	608000		10500	13500	1.29	1.001	1
PCB 167	617000		18500	18500	1.32	1.000	1
PCBs 156 + 157	1550000		35600	35600	1.35	1.000	1
PCB 169	713000		20400	20400	1.23	1.001	1
PCB 188	696000		14300	14300	1.03	1.000	1
PCB 189	696000		15900	15900	1.01	1.001	1
PCB 202	723000		12400	13500	0.98	1.000	1
PCB 205	836000		15900	15900	0.97	1.000	1
PCB 208	611000		12500	13500	0.75	1.000	1
PCB 206	742000		22800	22800	0.86	1.000	1
PCB 209	711000		16600	16600	1.33	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500023-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 01:10
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238863	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	1230000		7230	33800			1
Total DiCB	1390000		4540	67600			1
Total TriCB	1450000		17600	33800			1
Total TetraCB	1980000		11600	135000			1
Total PentaCB	4180000		8980	135000			1
Total HexaCB	3490000		10500	135000			1
Total HeptaCB	1390000		14300	67600			1
Total OctaCB	1560000		12400	67600			1
Total NonaCB	1350000		12500	33800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411748
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500023-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/23/15 01:10
Prep Method:	Method	**Date Extracted:**	1/19/15
Sample Amount:	1.4800mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238863	**Blank File Name:**	U238855
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238853

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1577.491	79		5-145	3.45	0.751
PCB 3L	2000	1256.340	63		5-145	2.93	0.878
PCB 4L	2000	1271.802	64		5-145	1.44	0.893
PCB 15L	2000	1085.942	54		5-145	1.73	1.235
PCB 19L	2000	1335.892	67		5-145	1.06	1.072
PCB 37L	2000	1020.559	51		5-145	0.92	1.090
PCB 54L	2000	1633.037	82		5-145	0.79	0.831
PCB 81L	2000	1145.173	57		10-145	0.83	1.348
PCB 77L	2000	1250.079	63		10-145	0.84	1.373
PCB 104L	2000	1547.727	77		10-145	1.58	0.820
PCB 123L	2000	1193.842	60		10-145	1.47	1.144
PCB 118L	2000	1266.831	63		10-145	1.50	1.154
PCB 114L	2000	1235.256	62		10-145	1.55	1.171
PCB 105L	2000	1228.715	61		10-145	1.47	1.194
PCB 126L	2000	1136.287	57		10-145	1.55	1.290
PCB 155L	2000	1842.953	92		10-145	1.28	0.789
PCB 167L	2000	1344.780	67		10-145	1.30	1.073
PCBs 156L + 157L	4000	2724.126	68		10-145	1.35	1.106
PCB 169L	2000	1426.821	71		10-145	1.30	1.185
PCB 188L	2000	1310.034	66		10-145	1.08	0.718
PCB 189L	2000	1326.089	66		10-145	1.03	0.960
PCB 202L	2000	1331.177	67		10-145	1.02	0.821
PCB 205L	2000	1217.610	61		10-145	0.97	1.009
PCB 208L	2000	1476.832	74		10-145	0.78	0.947
PCB 206L	2000	1358.278	68		10-145	0.87	1.042
PCB 209L	2000	1365.277	68		10-145	1.21	1.070
PCB 28L	2000	1323.323	66		5-145	1.00	0.930
PCB 111L	2000	1413.476	71		10-145	1.62	1.079
PCB 178L	2000	1600.188	80		10-145	1.02	1.008

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February 9, 2015

Analytical Report for Service Request No: K1411753
Revised Service Request No: K1411753.02

Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 98105

RE: RM 11E

Dear Tim:

Enclosed is the revised report for the samples submitted to our laboratory on October 22, 2014. For your reference, these analyses have been assigned our service request number K1411753.

The Polychlorinated Biphenyls have been removed from this report.

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.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) 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.

We apologize for any inconvenience this may have created.

Please call if you have any questions. My extension is 3316. You may also contact me via Email at Jeff.Christian@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Jeff Christian
Director of Operations - Western U.S.A.

JC/aj

REVISED
3:30 pm, Feb 09, 2015

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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 as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
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 analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
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 or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

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 as defined by the DOD or NELAC standards.
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 estimated value.
J	The result is an estimated value.
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.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

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.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science & Engineering for the Environment, LLC	**Service Request No.:**	K1411753
Project:	RM 11E	**Date Received:**	10/22/14
Sample Matrix:	Sediment		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV.

Sample Receipt

Seven sediment samples were received for analysis at ALS Environmental on 10/22/14. 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.

TOC by PSEP

No anomalies associated with the analysis of these samples were observed.

Particle Size by PSEP

No anomalies associated with the analysis of these samples were observed.

Black Carbon

The samples were shipped to ALS/Tucson (AZ) for the analysis of Black Carbon. The results are appended to this report and intended as a stand-alone document.

PCB Congeners by EPA Method 1668C

The samples were shipped to ALS/Houston (TX) for the analysis of PCB Congeners. The results are appended to this report and intended as a stand-alone document.

Approved by: Jeff Christian

Chain of Custody

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 x 07 • FAX (360) 636-1068 DATE _____ PAGE _____ OF _____

PROJECT NAME RMIIE #
PROJECT MANAGER Tim Thompson
COMPANY NAME SEE, LLC.
ADDRESS 4401 Latona Ave NE
Seattle, WA
PHONE 206-418-6173
SAMPLERS SIGNATURE

ANALYSIS REQUESTED ← ALS → ALS K1411753

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB Aroclors	PCB Congeners	Black Carbon	TOC	Grain Size	M.I.T.	Archive									REMARKS
RMIIE-PW001-Sed	10/20/14	11:35		SE	5	X	+	X	X	X	X	X									MIT-Black Carbon, T PCB Cong. (1 Jar)
RMIIE-PW002-Sed	10/20/14	10:18		SE	6	X	X	X	X	X		X									
RMIIE-PW003-Sed	10/20/14			SE	4	X	X	X	X	X		*									please archive remaining volume
RMIIE-PW004-Sed	10/20/14	13:05		SE	6	X	X	X	X	X	X	*									2 jars MIT-Black Ca TOC, PCB Cong./Aroclo
RMIIE-PW005-Sed	10/20/14	15:08		SE	4	X	X	X	X	X											
RMIIE-PW504-Sed	10/20/14	10:12		SE	4	X	X	X	X	X											
RMIIE-PW006-Sed	10/20/14			SE	7	X	X	X	X	X		X									

REPORT REQUIREMENTS

- ✓ I. Routine Report: Method Blank, Surrogate, as required
- ✓ II. Report Dup., MS, MSD as required
- III. CLP Like Summary (no raw data)
- IV. Data Validation Report
- ✓ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: SEE

TURNAROUND REQUIREMENTS

- 24 hr. 48 hr. 5 day
- ✓ Standard (10-15 working days)
- Provide Verbal Preliminary Results
- Provide FAX preliminary 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 Tl 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 Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
- Sample names are similar with date & time. Please pay close attention when assigning Lab id.
- Client will provide instructions for shipping samples to MIT

* where archival jar was not provided, please archive excess material after analysis

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature	Date/Time 10/21/2014 1700	Signature	Date/Time 10/22/14 0800	Signature	Date/Time	Signature	Date/Time
Printed Name Tim Thompson	Firm SEE	Printed Name Paula Smith	Firm ALS	Printed Name	Firm	Printed Name	Firm

DISTRIBUTION: WHITE - return with report to originator: YELLOW - lab: PINK - retained by originator

COC blank 2 2013

PC Christian

Cooler Receipt and Preservation Form

Client / Project: SEE Service Request *K14*

Received: 10/22/14 Opened: 10/22/14 By: KD Unloaded: 10/22/14 By: KD

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *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

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
NM	—	—	—	—	—			

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* N/A
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Page _____ *of* _____

General Chemistry

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
RM11E-PW001-SED	K1411753-001	**76.5**	-	-	1	10/30/14 10:13	
RM11E-PW002-SED	K1411753-002	**60.6**	-	-	1	10/30/14 10:13	
RM11E-PW003-SED	K1411753-003	**60.7**	-	-	1	10/30/14 10:13	
RM11E-PW004-SED	K1411753-004	**70.8**	-	-	1	10/30/14 10:13	
RM11E-PW005-SED	K1411753-005	**70.5**	-	-	1	10/30/14 10:13	
RM11E-PW504-SED	K1411753-006	**78.0**	-	-	1	10/30/14 10:13	
RM11E-PW006-SED	K1411753-007	**66.5**	-	-	1	10/30/14 10:13	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
		Date Analyzed:	10/30/14

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	RM11E-PW005-SED	**Units:**	Percent
Lab Code:	K1411753-005	**Basis:**	As Received

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1411753-005DUP Result	Average	RPD	RPD Limit
Solids, Total	160.3 Modified	-	-	70.5	71.0	70.8	<1	20

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.

ALS Group USA, Corp.
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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW001-SED
Lab Code: K1411753-001

Sand Fraction:	Dry Weight (Grams)	25.5330
Sand Fraction:	Weight Recovered (Grams)	25.3886
Sand Fraction:	Percent Recovery	99.43

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	2.1617	8.03
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.3879	5.16
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	4.3349	16.10
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	10.6253	39.47
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	5.3662	19.94
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.3990	5.20
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	0.8850	3.29
Clay (< 0.0039 mm)	> 8 Ø	0.2600	0.97
	Total	26.4200	98.16

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW002-SED
Lab Code: K1411753-002

Sand Fraction:	Dry Weight (Grams)	11.5004
Sand Fraction:	Weight Recovered (Grams)	11.3554
Sand Fraction:	Percent Recovery	98.74

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	1.1755	7.46
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.2300	1.46
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	0.3456	2.19
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	1.7080	10.84
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	3.9377	24.99
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	3.5534	22.56
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.8500	18.09
Clay (< 0.0039 mm)	> 8 Ø	1.2350	7.84
	Total	15.0352	95.43

ALS Group USA, Corp.
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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW003-SED
Lab Code: K1411753-003

Sand Fraction:	Dry Weight (Grams)	10.5115
Sand Fraction:	Weight Recovered (Grams)	10.4828
Sand Fraction:	Percent Recovery	99.73

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	6.0586	34.41
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.2968	1.69
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	0.2731	1.55
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.5746	3.26
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	1.0030	5.70
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.6792	9.54
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	6.5600	37.26
Clay (< 0.0039 mm)	> 8 Ø	2.6250	14.91
	Total	19.0703	108.32

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW004-SED
Lab Code: K1411753-004

Sand Fraction:	Dry Weight (Grams)	26.0468
Sand Fraction:	Weight Recovered (Grams)	25.9875
Sand Fraction:	Percent Recovery	99.77

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	5.7791	22.27
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.7880	3.04
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	2.0377	7.85
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	6.8893	26.55
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	7.9599	30.68
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.3425	9.03
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	1.0000	3.85
Clay (< 0.0039 mm)	> 8 Ø	0.4150	1.60
	Total	27.2115	104.87

ALS Group USA, Corp.
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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW005-SED
Lab Code: K1411753-005

Sand Fraction:	Dry Weight (Grams)	25.1032
Sand Fraction:	Weight Recovered (Grams)	25.0715
Sand Fraction:	Percent Recovery	99.87

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	13.4321	49.83
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	1.0355	3.84
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	2.3172	8.60
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	2.8614	10.61
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	3.7235	13.81
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	1.4962	5.55
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	2.7500	10.20
Clay (< 0.0039 mm)	> 8 Ø	1.4300	5.30
	Total	29.0459	107.74

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW504-SED
Lab Code: K1411753-006

Sand Fraction:	Dry Weight (Grams)	25.8633
Sand Fraction:	Weight Recovered (Grams)	25.8089
Sand Fraction:	Percent Recovery	99.79

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	3.9335	14.34
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.9718	3.54
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	2.0970	7.65
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	7.6495	27.89
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	8.6163	31.41
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	2.3130	8.43
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	1.1450	4.17
Clay (< 0.0039 mm)	> 8 Ø	0.4100	1.49
	Total	27.1361	98.92

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW006-SED
Lab Code: K1411753-007

Sand Fraction:	Dry Weight (Grams)	8.2210
Sand Fraction:	Weight Recovered (Grams)	8.2111
Sand Fraction:	Percent Recovery	99.88

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.0000	0.00
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.0000	0.00
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	0.0106	0.06
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.0460	0.26
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.2413	12.88
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	5.3157	30.55
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.7300	44.43
Clay (< 0.0039 mm)	> 8 Ø	2.1150	12.16
	Total	17.4586	100.34

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW006-SED
Lab Code: K1411753-007 DUP

Sand Fraction:	Dry Weight (Grams)	7.4787
Sand Fraction:	Weight Recovered (Grams)	7.4593
Sand Fraction:	Percent Recovery	99.74

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.0000	0.00
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.0000	0.00
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	0.0000	0.00
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.0429	0.26
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.1165	12.89
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	4.9255	30.00
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.2150	43.95
Clay (< 0.0039 mm)	> 8 Ø	2.0450	12.46
	Total	16.3449	99.56

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Analyzed:	11/17/2014

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: RM11E-PW006-SED
Lab Code: K1411753-007 TRP

Sand Fraction:	Dry Weight (Grams)	7.8085
Sand Fraction:	Weight Recovered (Grams)	7.7813
Sand Fraction:	Percent Recovery	99.65

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel (>2.00 mm)	<-1 Ø	0.0000	0.00
Sand, Very Coarse (1.00 mm to 2.00 mm)	-1 to 0 Ø	0.0000	0.00
Sand, Coarse (0.500 mm to 1.00 mm)	0 to 1 Ø	0.0000	0.00
Sand, Medium (0.250 mm to 0.500 mm)	1 to 2 Ø	0.0425	0.24
Sand, Fine (0.125 mm to 0.250 mm)	2 to 3 Ø	2.1746	12.43
Sand, Very Fine (0.0625 mm to 0.125 mm)	3 to 4 Ø	5.0748	29.00
Silt (0.0039 mm to 0.0625 mm)	4 to 8 Ø	7.8000	44.58
Clay (< 0.0039 mm)	> 8 Ø	2.2300	12.74
	Total	17.3219	98.99

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
Analysis Method:	PSEP TOC	**Units:**	Percent
Prep Method:	ALS SOP	**Basis:**	Dry, per Method

Carbon, Total Organic (TOC)

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
RM11E-PW001-SED	K1411753-001	**0.385**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW002-SED	K1411753-002	**2.51**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW003-SED	K1411753-003	**2.63**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW004-SED	K1411753-004	**1.26**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW005-SED	K1411753-005	**0.954**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW504-SED	K1411753-006	**1.06**	0.050	0.020	1	11/03/14 13:00	11/3/14	
RM11E-PW006-SED	K1411753-007	**0.924**	0.050	0.020	1	11/03/14 13:00	11/3/14	
Method Blank	K1411753-MB1	ND U	0.050	0.020	1	11/03/14 13:00	11/3/14	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
		Date Analyzed:	11/03/14

Triplicate Sample Summary
General Chemistry Parameters

Sample Name:	RM11E-PW001-SED	**Units:**	Percent
Lab Code:	K1411753-001	**Basis:**	Dry, per Method
Analysis Method:	PSEP TOC		
Prep Method:	ALS SOP		

Analyte Name	MRL	MDL	Sample Result	Duplicate K1411753-001DUP Result	Triplicate K1411753-001TRP Result	Average	RSD	RSD Limit
Carbon, Total Organic (TOC)	0.050	0.020	0.385	0.379	0.450	0.404	10	27

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.

Printed 11/21/2014 9:36:13 AM

SuperSet Reference:14-0000308469 rev 00

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
		Date Analyzed:	11/3/14
		Date Extracted:	11/3/14

Duplicate Matrix Spike Summary
Carbon, Total Organic (TOC)

Sample Name:	RM11E-PW001-SED	**Units:**	Percent
Lab Code:	K1411753-001	**Basis:**	Dry, per Method
Analysis Method:	PSEP TOC		
Prep Method:	ALS SOP		

		Matrix Spike K1411753-001MS			**Duplicate Matrix Spike** K1411753-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic (TOC)	0.385	6.35	5.88	102	6.50	6.27	98	69-123	4	27

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.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Analyzed:**	11/03/14
Sample Matrix:	Sediment	**Date Extracted:**	11/03/14

Lab Control Sample Summary
Carbon, Total Organic (TOC)

Analysis Method:	PSEP TOC	**Units:**	Percent
Prep Method:	ALS SOP	**Basis:**	Dry, per Method
		Analysis Lot:	421169

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1411753-LCS1	0.247	0.275	90	74-118

Client: Science and Engineering for the Environment, LLC **Service Request:** K1411753
Project: RM 11E

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic (TOC)

Analysis Method: PSEP TOC **Units:** Percent

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	421169	KQ1414883-01	11/03/14 13:00	20.0	19.4	97	90-110
CCV2	421169	KQ1414883-02	11/03/14 13:00	20.0	19.6	98	90-110
CCV3	421169	KQ1414883-03	11/03/14 13:00	20.0	19.7	98	90-110

Client: Science and Engineering for the Environment, LLC **Service Request:**K1411753
Project: RM 11E

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic (TOC)

Analysis Method: PSEP TOC **Units:**Percent

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	421169	KQ1414883-04	11/03/14 13:00	0.050	0.020	ND	U
CCB2	421169	KQ1414883-05	11/03/14 13:00	0.050	0.020	ND	U
CCB3	421169	KQ1414883-06	11/03/14 13:00	0.050	0.020	ND	U

Chlorinated Biphenyl Congeners

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

REVISED
3:30 pm, Feb 09, 2015

February 6, 2015 Service Request No: K1411753

Jeff Christian
ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Results for: Science and Engineering for the Environment, LLC.
Dear Jeff,

Enclosed is the amended report for samples submitted to our laboratory on October 23, 2014. For your reference, these analyses have been assigned our service request number **K1411753.**

This is a revised report reflecting the re-analysis of samples associated with K1411753. The original results are not included in the report. The case narrative has been updated accordingly.

Please replace your original copy of the report with the report enclosed.

Please contact me if you have any questions. My direct number is 281-575-2278.

Respectfully submitted,

Rebecca Pierrot
Quality Assurance Quality Control

ALS Environmental

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

November 19, 2014 Service Request No: K1411753

Jeff Christian.

ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Result for: Science and Engineering for the Environment, LLC.
Dear Jeff:

Enclosed are the results of the sample(s) submitted to our laboratory on October 23, 2014. For Your reference, these analyses have been assigned our service request number: **K1411753.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct line is 281-575-2279. You may also contact me via email at Arthi.Kodur@alsglobal.com

Respectfully submitted,

ALS Group USA Corp., dba ALS Environmental

Arthi Kodur
Project Manager

Page 1 of _____

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment, LLC	**Service Request No.:**	K1411753
Project:	RM 11E	**Date Received:**	10/23/14
Sample Matrix:	Sediment		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seven sediment samples were received for analysis at ALS Environmental on 10/23/14.

Please note the reporting forms are currently referencing the date ALS Environmental-Kelso received the samples (10/22/14) and not the date ALS Environmental-Houston received the samples (10/23/14).

The samples were received at 0°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Re-extraction

Samples associated with service request K1411753 was originally extracted on batch EQ1400723, but required re-extraction due to a contaminated method. The sample was re-extracted on batch EQ150059. A smaller sample size was used. The valid results are reported from the second extraction. The results from the first extraction are not included in this report.

Data Validation Notes and Discussion

B flags – Method Blanks

The Method Blank EQ1500059-01 contained low levels of various congeners below the Method Reporting Limit (MRL).

The Method Blank EQ1500059-01 contained low levels of PCB 52 above the reported MRL, but not greater than the MRL established by analytical method 1668C. The Method Reporting Limit (MRL) established by analytical method 1668C for PCB 52 is 100 ng/kg.

The associated compounds in the samples are flagged with ‘B’ flags.

MS/MSD

EQ1500059: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The batch quality control criteria were met.

E flag

Samples associated with service request K1411753 were reported with an 'E' flag to denote that they had concentration greater than the high calibration point. The process of dilution is counter to the isotopic dilution technique that the laboratory uses to determine recovery and produces variability in the final value. The laboratory has demonstrated linearity of the curve above the highest calibration point and only dilutes when concentrations are greater than the demonstrated level or when detector saturation occurs.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

The Ion Abundance Ratio (IAR) for the K1411753-005 for PCB 188L did not meet the theoretical ion ratio QC limits as established in Table 8 of EPA method 1668A. These values were evaluated against the most recent continuing calibration (CCAL) and found to be within 15% of the IAR's in the continuing calibration verification standard. This meets one of the three acceptable evaluations of the IAR in section 16.3 of the method in evaluating qualitative determination of target analytes.

Signal to Noise

PCB 1L was below 2.5 signal to noise for EQ1500059-02 (LCS) and 03 (DLCS).

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

Where the EDL exceeds the MRL, the MRL is raised to equal the EDL.

Manual Integrations

For this type of instrumentation and software, manual integration may be required frequently to correct inaccurate integrations performed by the processing software. These manual integrations are indicated in the raw data with a before and after chromatogram and are stamped with the reason for integration.

The TEQ Summary results for each sample have been calculated by ALS ENVIRONMENTAL/Houston to include:

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not

attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: Science and Engineering for the Environment, LLC **Service Request:**K14117 3
Project: RM 11E

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
K14117 3-001	RM11E-PW001-SED	10/20/2014	113
K14117 3-002	RM11E-PW002-SED	10/20/2014	1018
K14117 3-003	RM11E-PW003-SED	10/20/2014	0000
K14117 3-004	RM11E-PW004-SED	10/20/2014	130
K14117 3-00	RM11E-PW00 -SED	10/20/2014	1 08
K14117 3-00	RM11E-PW 04-SED	10/20/2014	1012
K14117 3-007	RM11E-PW00 -SED	10/20/2014	0000

Service Request Summary

Folder #: **K1411753**
Client Name: Science and Engineering for the Environment, LLC
Pro ect Name: RM 11E
Pro ect Number:

Report To: Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810
SA
Phone Number: 20 -418- 173
Cell Number: 20 - 1 -410
Fa Number: 20 -418- 187
E-mail: tthompson seellc.com

Pro ect Chemist: eff Christian
Originating Lab: KELSO
Logged By: KSMITH
Date Received: 10/22/14
Internal Due Date: 11/13/2014
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged : N,
Report to MDL : N,
P.O. Number:
EDD: Striplin GSI

37 8 o -Glass ar WM CLEAR Teflon Liner npreserved
Location: K-DWA E-C3, EHRMS-WIC E, K-Custody Relin
Pressure Gas:

				T CSON		KELSO			KELSO	HO ST ON
Lab Samp No.	**Client Samp No**	**Matrix**	**Collected**	Blac Carbon/GBC Cyc 4 881-8 0 12 01	Water Cont/ASTM D221	PSEP PartSi eCB/PSEP PS	PSEP TOC T/PSEP TOC	TS/1 0.3 Modified	PCB LL/8082A	Cl Biphen Cong/1 8C
K14117 3-001	RM11E-PW001-SED	Sediment	10/20/14 113	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-002	RM11E-PW002-SED	Sediment	10/20/14 1018	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-003	RM11E-PW003-SED	Sediment	10/20/14 0000	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-004	RM11E-PW004-SED	Sediment	10/20/14 130	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-00	RM11E-PW00 -SED	Sediment	10/20/14 1 08	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-00	RM11E-PW 04-SED	Sediment	10/20/14 1012	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
K14117 3-007	RM11E-PW00 -SED	Sediment	10/20/14 0000	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**

Service Request Summary

Folder #:	**K1411753**	Pro ect Chemist:	eff Christian
Client Name:	Science and Engineering for the Environment, LLC	Originating Lab:	KELSO
Pro ect Name:	RM 11E	Logged By:	KSMITH
Pro ect Number:		Date Received:	10/22/14
		Internal Due Date:	11/13/2014
Report To:	Tim Thompson	AP:	LAB AP
	Science and Engineering for the Environment, LLC	ualifier Set:	Lab Standard
	4401 Latona Ave NE	Formset:	Lab Standard
	Seattle, WA 810 SA	Merged :	N,
Phone Number:	20 -418- 173	Report to MDL :	N,
Cell Number:	20 - 1 -410	P.O. Number:	
Fa Number:	20 -418- 187	EDD:	Striplin GSI
E-mail:	tthompson seellc.com		

37 8 o -Glass ar WM CLEAR Teflon Liner npreserved

Location: K-DWA E-C3, EHRMS-WIC E, K-Custody Relin

Pressure Gas:

Superset Summary

Service Request: K14117 3 **SuperSet Reference:** 14-00003084 rev 00

Analytical Method: **1668C**

Calibrations: 02/11/14

Data Files:

Raw Data	Begin CCAL	Method Blan	Lab ID
U238940	238 32	1 2211	E 1 000 -02
U238941	238 32	1 2211	E 1 000 -03

Calibrations: 10/08/14

Data Files:

Raw Data	Begin CCAL	Method Blan	Lab ID
U152211	1 2210	1 2211	E 1 000 -01
U152212	1 2210	1 2211	K14117 3-001
U152213	1 2210	1 2211	K14117 3-002
U152214	1 2210	1 2211	K14117 3-003
U152215	1 2210	1 2211	K14117 3-004
U152216	1 2210	1 2211	K14117 3-00
U152217	1 2210	1 2211	K14117 3-00
U152218	1 2210	1 2211	K14117 3-007

Data Qualifiers

HRMS Qualifier Set

B Indicates the associated analyte was found in the method blank at >1/10th the reported value.

E Estimated value. The reported concentration is above the calibration range of the instrument.

H Sample extracted and/or analyzed out of suggested holding time.

J Estimated value. The reported concentration is below the MRL.

K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. Reported concentration is a conservative estimate, however EMPC correction was not applied.

P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.

Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.

S Signal saturated detector. Result reported from dilution.

U Compound was analyzed for, but was not detected (ND).

X See Case Narrative.

Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.

i The MDL/MRL have been elevated due to a matrix interference.

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01	11/30/2015
Arizona Department of Health Services	AZ0793	5/27/2015
Arkansas Department of Environmental Quality	14-038-0	6/16/2015
California Department of Health Services	2452	2/28/2015
Florida Department of Health	E87611	6/30/2015
Hawaii Department of Health	TX02694	6/30/2015
Illinois Environmental Protection Agency	200057	10/6/2015
Louisiana Department of Health and Hospitals	TX2694	6/30/2015
Maine Center for Disease Control and Prevention	2014019	6/5/2016
Maryland Department of the Environment	343	6/30/2015
Michigan Depratment of Environmental Quality	9971	6/30/2015
Nebraska Department of Health and Human Services	NE-OS-25-13	6/30/2015
Nevada Department of Concervation and Natural Resources	TX014112013-2	7/31/2015
New Jersey Department of Environmental Protection	NLC140001	6/30/2015
New Mexico Environment Department	TX02694	6/30/2015
New York Department of Health	11707	4/1/2015
Oklahoma Department of Environmental Quality	2014-124	8/31/2015
Oregon Environmental Laboratory Accreditation Program	TX200002	3/24/2015
Pennsylvania Department of Environmental Protection	68-03441	6/30/2015
Tennessee Department of Environment and Concervation	04016	6/30/2015
Texas Commision on Environmental Quality	TX104704216-14-5	6/30/2015
United States Department of Agriculture	P330-14-00067	2/21/2017
Utah Department of Health Environmental Laboratory Certification	TX02694	7/31/2015
Washington Department of Health	c819	11/14/2015
West Virginia Department of Environmental Protection	347	6/30/2015

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID: 1C141175 3 | DB-5 | DB-5MSUI | DB-225 | SPB-Octyl

First Level – Data Processing – to be filled by person generating the forms

Date: 2/2/15 Analyst: Lee Samples: 1-7

Second Level - Data Review – to be filled by person doing peer review

Date: 02/03/15 Analyst: [illegible] Samples: 0QL007RE

PEER REVIEW PAGE

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM 11E
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

K1411753 5
Science and Engineering for the Environment, LLC
RM 11E

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Cl Biphen Cong 1668C
K1411753-001	RM11E-PW001-SED	1	Sediment	10/20/14	1135	10/22/14	HOUSTON	IV
K1411753-002	RM11E-PW002-SED	1	Sediment	10/20/14	1018	10/22/14	HOUSTON	IV
K1411753-003	RM11E-PW003-SED	1	Sediment	10/20/14	0000	10/22/14	HOUSTON	IV
K1411753-004	RM11E-PW004-SED	1	Sediment	10/20/14	1305	10/22/14	HOUSTON	IV
K1411753-005	RM11E-PW005-SED	1	Sediment	10/20/14	1508	10/22/14	HOUSTON	IV
K1411753-006	RM11E-PW504-SED	1	Sediment	10/20/14	1012	10/22/14	HOUSTON	IV
K1411753-007	RM11E-PW006-SED	1	Sediment	10/20/14	0000	10/22/14	HOUSTON	IV

Special Instructions/Comments

Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

Note: Critical Due Date.

pH Checked _____

Turnaround Requirements

_____ **RUSH** (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

____ **STANDARD**

Requested FAX Date: _____

Requested Report Date: 11/13/14

Report Requirements

____ I. Results Only

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

X IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# K1411753

Bill to

Relinquished By: [illegible] 10/22/14 1300 Received By: [illegible] 10/23/14 1100 Airbill Number: _____

ALS Environmental

Cooler Receipt Form

Project Chemist AK

Client/Project Kelso - Sci. and Eng. for the Environ Thermometer ID SMO

Date/Time Received: 10/23/14 1100 Initials: JCL Date/Time Logged in: 10/23/14 1330 Initials JCL

1. Method of delivery: ○ US Mail ☑ Fed Ex ○ UPS ○ DHL ○ Courier ○ Client
2. Samples received in: ☑ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ☑ Yes ○ No
   Were they intact? ☑ Yes ○ No ○ N/A
   Were they signed and dated? ☑ Yes ○ No ○ N/A
   If yes, how many and where? one front seal
4. Packing Material: ○ Inserts ○ Baggies ☑ Bubble Wrap ☑ Gel Packs ○ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ☑ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
5478 9738 6879		10/23/14	1130	JCL	4	☐
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☑ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☑ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☑ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☑ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☑ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label: K1411753 5
Science and Engineering for the Environment, LLC
RM 11E

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
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www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 227781 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/DEDWARDS **Prep Method:** Method Soxhlet **Prep Date/Time:** 1/22/15 02:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1500059-01	MB		1668C/Cl Biphen Cong		Solid	1.261g	
2	EQ1500059-02	LCS		1668C/Cl Biphen Cong		Solid	1.087g	
3	EQ1500059-03	DLCS		1668C/Cl Biphen Cong		Solid	1.445g	
4	K1411753-001RE	RM11E-PW001-SED	.01	1668C/Cl Biphen Cong		Sediment	1.456g	Wet, Brown Dirt
5	K1411753-002RE	RM11E-PW002-SED	.01	1668C/Cl Biphen Cong		Sediment	1.313g	Wet, Brown Sludge
6	K1411753-003RE	RM11E-PW003-SED	.01	1668C/Cl Biphen Cong		Sediment	1.422g	Wet, Brown Sludge
7	K1411753-004RE	RM11E-PW004-SED	.01	1668C/Cl Biphen Cong		Sediment	1.420g	Wet, Brown Dirt
8	K1411753-005RE	RM11E-PW005-SED	.01	1668C/Cl Biphen Cong		Sediment	1.168g	Wet, Brown Sludge
9	K1411753-006RE	RM11E-PW504-SED	.01	1668C/Cl Biphen Cong		Sediment	1.351g	Wet, Brown Dirt
10	K1411753-007RE	RM11E-PW006-SED	.01	1668C/Cl Biphen Cong		Sediment	1.462g	Wet, Brown Sludge

Spiking Solutions

Name: 1668A Working Matrix Standard Inventory ID 77973 Logbook Ref: 77973 1-2ng/mL LM 1/12/15 Expires On: 01/12/2016

EQ1500059-02	1,000.00µL	EQ1500059-02	1,000.00µL	EQ1500059-03	1,000.00µL	EQ1500059-03	1,000.00µL

Name: 1668A Labeled Working Standard Inventory ID 78157 Logbook Ref: 2-4 ng/ml 78157 DE 1-19-15 Expires On: 01/19/2016

EQ1500059-01	1,000.00µL	EQ1500059-01	1,000.00µL	EQ1500059-02	1,000.00µL	EQ1500059-02	1,000.00µL	EQ1500059-03	1,000.00µL	EQ1500059-03	1,000.00µL
K1411753-001	1,000.00µL	K1411753-002	1,000.00µL	K1411753-003	1,000.00µL	K1411753-004	1,000.00µL	K1411753-005	1,000.00µL	K1411753-006	1,000.00µL
K1411753-007	1,000.00µL										

Name: 1668A Clean Up Working Standard Inventory ID 78247 Logbook Ref: 78247 20ng/mL LM 1/22/15 Expires On: 01/22/2016

EQ1500059-01	200.00µL	EQ1500059-01	200.00µL	EQ1500059-02	200.00µL	EQ1500059-02	200.00µL	EQ1500059-03	200.00µL	EQ1500059-03	200.00µL
K1411753-001	200.00µL	K1411753-002	200.00µL	K1411753-003	200.00µL	K1411753-004	200.00µL	K1411753-005	200.00µL	K1411753-006	200.00µL
K1411753-007	200.00µL										

Preparation Materials

Glass Wool	AL 10/22/14 (75977)	Sulfuric Acid Reagent Grade H2SO4	AL 10/20/14 (75883)	Hexanes 95%	AL 1/15/15 (78091)
Dichloromethane (Methylene Chloride) 99.9% MeCl2	LM12/15/14 (77367)	Sodium Chloride Reagent Grade NaCl	C2-65-5 (38670)	Toluene 99.9% Minimum	AL 1/15/15 (78092)
Silica Gel Reagent Grade	AL 12/3/14 (76978)	Sodium Hydroxide Reagent Grade NaOH	LM 09/02/14 (74232)	Sodium Sulfate Anhydrous Reagent Grade Na2SO4	LM 11/20/14 (76802)

Preparation Information Benchsheet

Prep Run#: 227781 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/DEDWARDS **Prep Method:** Method **Prep Date/Time:** 1/22/15 02:00 PM

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	1/22/15 14:00	Started:	1/28/15 06:00	Started:	1/29/15 08:20	Started:	1/30/15 11:00
Finished:	~~1/22/15 15:00~~ 1/23/1507:40	Finished:	1/28/15 08:20	Finished:	1/29/15 09:10	Finished:	1/30/15 12:00
By:	DEDWARDS	By:	CDIAZ	By:	CDIAZ	By:	DEDWARDS
Comments	ak 2/6/15	Comments		Comments		Comments	

Comments:

Reviewed By: ak Date: 2/6/15 Spike Witness: AKODUR Date:

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined

Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	12.6	18.0			1
PCB 2	ND	U	13.3	18.0			1
PCB 3	ND	U	14.3	18.0			1
PCB 4	ND	U	259	259	-		1
PCB 10	ND	U	166	166	-		1
PCB 9	ND	U	71.7	71.7	-		1
PCB 7	ND	U	65.4	65.4	-		1
PCB 6	ND	U	70.4	70.4	-		1
PCB 5	ND	U	70.9	70.9	-		1
PCB 8	ND	U	66.7	66.7	-		1
PCB 14	ND	U	72.3	72.3	-		1
PCB 11	ND	U	74.6	89.8	-		1
PCBs 12 + 13	ND	U	71.6	71.6	-		1
PCB 15	ND	U	78.7	78.7	-		1
PCB 19	2790		41.5	41.5	0.98	1.000	1
PCB 18	ND	U	30.3	44.9			1
PCB 30	162		41.3	44.9	1.13	1.102	1
PCB 17	632		42.3	42.3	0.97	1.124	1
PCB 27	291		31.8	31.8	0.91	1.136	1
PCB 24	ND	U	28.4	28.4			1
PCB 16	ND	U	48.7	48.7			1
PCB 32	462		28.6	28.6	1.02	1.180	1
PCB 34	ND	U	23.3	23.3			1
PCB 23	ND	U	20.2	20.2			1
PCBs 26 + 29	83.5		21.6	44.9	1.05	1.275	1
PCB 25	128		16.2	18.0	1.05	0.830	1
PCB 31	103		19.9	44.9	1.15	0.840	1
PCBs 20 + 28	549		38.0	44.9	1.11	0.851	1
PCBs 21 + 33	235		31.1	44.9	1.06	0.858	1
PCB 22	ND	U	21.2	21.2			1
PCB 36	ND	U	21.1	21.1			1
PCB 39	ND	U	19.9	19.9			1
PCB 38	ND	U	23.4	23.4			1
PCB 35	ND	U	22.8	22.8			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	26.8	26.8			1
PCB 54	1640		31.1	31.1	0.76	1.001	1
PCBs 50 + 53	7220		39.0	89.8	0.75	0.907	1
PCBs 45 + 51	10400		40.1	44.9	0.72	0.934	1
PCB 46	211**K**		48.6	48.6	0.92	0.947	1
PCB 52	8250		42.8	44.9	0.76	1.000	1
PCBs 43 + 73	ND	U	34.8	44.9			1
PCB 69	ND	U	24.1	89.8			1
PCB 49	10200		38.3	89.8	0.73	1.019	1
PCB 48	ND	U	38.5	44.9			1
PCBs 44 + 47 + 65	21600		33.6	89.8	0.75	1.039	1
PCBs 59 + 62 + 75	389**K**		29.6	89.8	0.90	1.050	1
PCB 42	289**K**		35.0	89.8	0.45	1.061	1
PCB 41	591		50.0	89.8	0.71	1.078	1
PCBs 40 + 71	1570		36.6	89.8	0.80	1.083	1
PCB 64	202		22.4	44.9	0.73	1.090	1
PCB 72	ND	U	29.9	44.9			1
PCB 68	110		27.8	44.9	0.65	1.131	1
PCB 57	ND	U	32.8	44.9			1
PCB 58	ND	U	31.4	44.9			1
PCB 67	ND	U	28.6	44.9			1
PCB 63	ND	U	32.4	44.9			1
PCB 61	ND	U	33.9	180			1
PCBs 70 + 74 + 76	1240		27.5	180	0.74	1.192	1
PCB 66	1330		40.8	44.9	0.76	1.205	1
PCB 55	ND	U	44.3	44.9			1
PCB 56	126**K**		22.9	44.9	0.90	0.907	1
PCB 60	41.1**JK**		22.1	44.9	0.92	0.913	1
PCB 80	ND	U	19.5	44.9			1
PCB 79	45.3		20.9	44.9	0.68	0.969	1
PCB 78	ND	U	23.7	44.9			1
PCB 81	ND	U	21.5	21.5			1
PCB 77	83.2**K**		20.7	20.7	1.72	1.001	1
PCB 104	471		32.7	32.7	1.62	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	1390**K**		18.8	44.9	1.81	1.021	1
PCB 103	1570		22.9	44.9	1.77	1.088	1
PCB 94	699**K**		24.8	44.9	2.53	1.100	1
PCBs 95 + 100	13700		22.6	180	1.73	1.120	1
PCB 93	ND	U	26.8	180			1
PCBs 98 + 102	624**K**		21.3	180	1.87	1.131	1
PCB 88	ND	U	26.6	44.9			1
PCB 91	8520		22.8	44.9	1.66	1.152	1
PCB 84	1790		28.8	28.8	1.55	1.164	1
PCB 89	ND	U	114	114			1
PCB 121	116**K**		70.9	70.9	2.20	1.189	1
PCB 92	2690		107	107	1.48	0.982	1
PCBs 90 + 101 + 113	14000		90.8	180	1.58	1.001	1
PCBs 83 + 99	6710		103	103	1.59	1.018	1
PCB 112	ND	U	76.7	76.7			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	7040		85.8	180	1.55	1.041	1
PCBs 117 + 116	978		75.9	89.8	1.73	1.055	1
PCB 85	3660**K**		112	112	1.80	1.063	1
PCBs 110 + 115	8410		64.9	89.8	1.52	1.066	1
PCB 82	723**K**		133	133	1.92	1.078	1
PCB 111	ND	U	72.6	72.6			1
PCB 120	ND	U	72.5	72.5			1
PCBs 108 + 124	351		35.6	89.8	1.61	0.991	1
PCB 107	565		39.4	44.9	1.59	0.997	1
PCB 123	87.6		33.0	33.0	1.76	1.000	1
PCB 106	ND	U	37.8	44.9			1
PCB 118	6460		32.0	32.0	1.59	1.001	1
PCB 122	90.9		42.3	44.9	1.35	1.012	1
PCB 114	143		32.8	32.8	1.52	1.000	1
PCB 105	2520		32.8	32.8	1.54	1.000	1
PCB 127	ND	U	38.2	44.9			1
PCB 126	173**K**		33.2	33.2	3.48	1.001	1
PCB 155	71.5		32.0	32.0	1.24	1.001	1
PCB 152	563		22.1	44.9	1.22	1.014	1
PCB 150	394		18.2	44.9	1.29	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	3540		21.4	44.9	1.29	1.033	1
PCB 145	ND	U	19.9	44.9			1
PCB 148	207		27.9	44.9	1.33	1.084	1
PCB 151	6120		30.7	89.8	1.31	1.106	1
PCBs 135 + 154	1600		24.2	89.8	1.24	1.110	1
PCB 144	372**K**		26.4	44.9	1.47	1.124	1
PCBs 147 + 149	17700		59.9	89.8	1.26	0.892	1
PCB 134	633		59.9	89.8	1.33	0.898	1
PCB 143	ND	U	67.6	89.8			1
PCBs 139 + 140	281		60.6	89.8	1.14	0.906	1
PCB 131	126		59.3	59.3	1.11	0.913	1
PCB 142	ND	U	70.7	70.7			1
PCB 132	5020		69.9	69.9	1.23	0.927	1
PCB 133	436		70.5	70.5	1.36	0.935	1
PCB 165	ND	U	50.4	50.4			1
PCB 146	2910		63.2	63.2	1.27	0.952	1
PCB 161	ND	U	48.8	48.8			1
PCBs 153 + 168	14900		50.8	89.8	1.23	0.967	1
PCB 141	2780		65.6	65.6	1.23	0.974	1
PCB 130	855		80.7	80.7	1.13	0.985	1
PCB 137	659		61.3	61.3	1.21	0.989	1
PCB 164	906		50.6	50.6	1.08	0.993	1
PCBs 129 + 138 + 163	21100		73.7	180	1.27	1.001	1
PCB 160	ND	U	28.6	180			1
PCB 158	1380		45.5	45.5	1.13	1.010	1
PCB 166	ND	U	50.9	89.8			1
PCB 128	1830		63.3	89.8	1.28	1.035	1
PCB 159	133**K**		51.2	51.2	0.94	0.982	1
PCB 162	ND	U	46.2	46.2			1
PCB 167	419**K**		40.0	40.0	1.52	1.001	1
PCBs 156 + 157	1250		67.9	67.9	1.22	1.001	1
PCB 169	ND	U	40.2	40.2			1
PCB 188	163		26.4	26.4	0.95	1.001	1
PCB 179	2720		19.4	44.9	1.01	1.014	1
PCB 184	ND	U	17.0	44.9			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	669		19.9	44.9	1.05	1.038	1
PCB 186	ND	U	18.8	44.9			1
PCB 178	1320		26.2	44.9	1.07	1.086	1
PCB 175	ND	U	26.1	44.9			1
PCB 187	7400		23.3	44.9	1.03	1.110	1
PCB 182	ND	U	26.0	44.9			1
PCB 183	4320		44.3	89.8	1.00	1.127	1
PCB 185	890**K**		41.2	89.8	0.88	1.132	1
PCB 174	5630		44.9	44.9	0.94	1.136	1
PCB 177	3950		48.9	48.9	0.93	1.148	1
PCB 181	ND	U	40.7	44.9			1
PCBs 171 + 173	2060		49.5	89.8	0.94	1.165	1
PCB 172	1290**K**		51.3	51.3	0.88	0.898	1
PCB 192	ND	U	35.8	44.9			1
PCBs 180 + 193	14300		34.3	89.8	0.97	0.911	1
PCB 191	315		37.2	44.9	0.95	0.918	1
PCB 170	6980		51.1	51.1	0.94	0.938	1
PCB 190	1520		34.8	44.9	0.96	0.948	1
PCB 189	200		24.2	24.2	1.09	1.001	1
PCB 202	648		21.2	21.2	0.82	1.001	1
PCB 201	490		19.5	44.9	0.79	1.022	1
PCB 204	ND	U	19.7	44.9			1
PCB 197	164**K**		18.0	89.8	0.68	1.043	1
PCB 200	394		20.0	89.8	0.90	1.048	1
PCBs 198 + 199	3480		26.5	89.8	0.87	1.115	1
PCB 196	2250		27.9	44.9	0.84	0.916	1
PCB 203	2070		22.9	44.9	0.89	0.919	1
PCB 195	1740		29.4	44.9	0.85	0.946	1
PCB 194	4110		27.9	44.9	0.88	0.991	1
PCB 205	201		19.8	19.8	0.82	1.000	1
PCB 208	126		29.8	29.8	0.67	1.001	1
PCB 207	109**K**		28.8	44.9	1.01	1.020	1
PCB 206	794		27.7	27.7	0.80	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	ND	U	19.9	19.9			1
Total MonoCB	ND	U	12.6	44.9			1
Total DiCB	ND	U	65.4	89.8			1
Total TriCB	5440		16.2	44.9			1
Total TetraCB	65600		19.5	180			1
Total PentaCB	83500		18.8	180			1
Total HexaCB	86200		18.2	180			1
Total HeptaCB	53800		17.0	89.8			1
Total OctaCB	15500		18.0	89.8			1
Total NonaCB	1030		27.7	44.9			1
Total PCBs	311000		12.6	180			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	Percent
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 19:11
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.456g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152212	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	649.227	32		5-145	3.31	0.745
PCB 3L	2000	711.001	36		5-145	3.40	0.871
PCB 4L	2000	506.726	25		5-145	1.57	0.887
PCB 15L	2000	826.388	41		5-145	1.65	1.237
PCB 19L	2000	567.743	28		5-145	1.15	1.072
PCB 37L	2000	984.087	49		5-145	1.01	1.090
PCB 54L	2000	586.660	29		5-145	0.81	0.823
PCB 81L	2000	955.568	48		10-145	0.83	1.361
PCB 77L	2000	947.424	47		10-145	0.77	1.386
PCB 104L	2000	617.523	31		10-145	1.62	0.814
PCB 123L	2000	886.718	44		10-145	1.56	1.149
PCB 118L	2000	895.703	45		10-145	1.56	1.159
PCB 114L	2000	878.263	44		10-145	1.60	1.176
PCB 105L	2000	880.623	44		10-145	1.64	1.200
PCB 126L	2000	879.862	44		10-145	1.50	1.298
PCB 155L	2000	709.379	35		10-145	1.33	0.785
PCB 167L	2000	908.788	45		10-145	1.27	1.076
PCBs 156L + 157L	4000	1878.846	47		10-145	1.24	1.106
PCB 169L	2000	968.977	48		10-145	1.24	1.190
PCB 188L	2000	570.627	29		10-145	1.17	0.713
PCB 189L	2000	881.993	44		10-145	0.99	0.959
PCB 202L	2000	658.510	33		10-145	0.86	0.818
PCB 205L	2000	905.314	45		10-145	0.93	1.009
PCB 208L	2000	690.456	35		10-145	0.84	0.947
PCB 206L	2000	928.024	46		10-145	0.81	1.042
PCB 209L	2000	1146.289	57		10-145	1.31	1.071
PCB 28L	4000	2529.262	63		5-145	1.05	0.926
PCB 111L	4000	1801.737	45		10-145	1.55	1.084
PCB 178L	4000	1573.193	39		10-145	1.15	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Units:**	ng/Kg
Lab Code:	K1411753-001	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	21.5	21.5	1	0.0003	
PCB 77	**83.2**	20.7	20.7	1	0.0001	0.00832
PCB 123	**87.6**	33.0	33.0	1	0.00003	0.00263
PCB 118	**6460**	32.0	32.0	1	0.00003	0.194
PCB 114	**143**	32.8	32.8	1	0.00003	0.00429
PCB 105	**2520**	32.8	32.8	1	0.00003	0.0756
PCB 126	**173**	33.2	33.2	1	0.1	17.3
PCB 167	**419**	40.0	40.0	1	0.00003	0.0126
PCBs 156 + 157	**1250**	67.9	67.9	1	0.00003	0.0375
PCB 169	ND	40.2	40.2	1	0.03	
PCB 189	**200**	24.2	24.2	1	0.00003	0.00600
		Total TEQ				17.6

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	100**K**		14.6	25.1	3.85	1.001	1
PCB 2	33.1**K**		14.8	25.1	2.13	0.988	1
PCB 3	49.4**K**		15.4	25.1	3.92	1.000	1
PCB 4	3870		272	272	-	1.001	1
PCB 10	ND	U	171	171	-		1
PCB 9	ND	U	100	100	-		1
PCB 7	ND	U	91.2	91.2	-		1
PCB 6	191		98.1	98.1	-	1.156	1
PCB 5	ND	U	98.8	98.8	-		1
PCB 8	460		93.0	93.0	-	1.189	1
PCB 14	ND	U	101	101	-		1
PCB 11	ND	U	104	126	-		1
PCBs 12 + 13	ND	U	99.9	99.9	-		1
PCB 15	255		111	111	-	1.001	1
PCB 19	10700		47.9	47.9	1.02	1.001	1
PCB 18	ND	U	33.7	62.8			1
PCB 30	1470		45.9	62.8	1.01	1.103	1
PCB 17	3740		47.0	47.0	1.00	1.124	1
PCB 27	1250		35.3	35.3	1.02	1.138	1
PCB 24	ND	U	31.6	31.6			1
PCB 16	286		54.1	54.1	0.96	1.154	1
PCB 32	5440		31.7	31.7	1.04	1.180	1
PCB 34	ND	U	79.6	79.6			1
PCB 23	ND	U	69.1	69.1			1
PCBs 26 + 29	785		73.8	73.8	1.05	1.276	1
PCB 25	624		55.3	55.3	1.00	0.829	1
PCB 31	1540		67.8	67.8	1.06	0.840	1
PCBs 20 + 28	6500		130	130	0.98	0.850	1
PCBs 21 + 33	1440		107	107	1.00	0.858	1
PCB 22	298		72.4	72.4	1.03	0.875	1
PCB 36	ND	U	71.9	71.9			1
PCB 39	ND	U	68.0	68.0			1
PCB 38	ND	U	80.0	80.0			1
PCB 35	ND	U	78.0	78.0			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	294**K**		89.5	89.5	1.39	1.001	1
PCB 54	6780		44.7	44.7	0.78	1.001	1
PCBs 50 + 53	26800		37.7	126	0.75	0.907	1
PCBs 45 + 51	37000		38.7	62.8	0.77	0.935	1
PCB 46	1490		46.9	46.9	0.74	0.948	1
PCB 52	25700		41.4	62.8	0.75	1.001	1
PCBs 43 + 73	ND	U	33.6	62.8			1
PCB 69	ND	U	23.3	126			1
PCB 49	32800		37.1	126	0.73	1.019	1
PCB 48	ND	U	37.2	62.8			1
PCBs 44 + 47 + 65	53000		32.5	126	0.76	1.040	1
PCBs 59 + 62 + 75	1240		28.7	126	0.77	1.051	1
PCB 42	907		33.8	126	0.82	1.062	1
PCB 41	1700		48.3	126	0.73	1.079	1
PCBs 40 + 71	4410		35.4	126	0.75	1.083	1
PCB 64	534		21.7	62.8	0.80	1.091	1
PCB 72	185**K**		28.9	62.8	0.48	1.121	1
PCB 68	554**K**		26.9	62.8	1.06	1.132	1
PCB 57	ND	U	31.7	62.8			1
PCB 58	ND	U	30.4	62.8			1
PCB 67	ND	U	27.7	62.8			1
PCB 63	282		31.4	62.8	0.70	1.177	1
PCB 61	ND	U	32.8	251			1
PCBs 70 + 74 + 76	2340		26.6	251	0.75	1.192	1
PCB 66	2610		39.4	62.8	0.77	1.206	1
PCB 55	ND	U	42.9	62.8			1
PCB 56	346		40.4	62.8	0.81	0.908	1
PCB 60	74.4		38.9	62.8	0.74	0.913	1
PCB 80	ND	U	34.3	62.8			1
PCB 79	72.1**K**		36.9	62.8	0.47	0.969	1
PCB 78	ND	U	41.7	62.8			1
PCB 81	ND	U	38.3	38.3			1
PCB 77	117**K**		37.3	37.3	1.14	1.001	1
PCB 104	1130		54.7	54.7	1.66	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	2440		30.4	62.8	1.69	1.021	1
PCB 103	3280		37.1	62.8	1.71	1.089	1
PCB 94	1860		40.3	62.8	1.68	1.101	1
PCBs 95 + 100	17000		36.7	251	1.67	1.121	1
PCB 93	ND	U	43.4	251			1
PCBs 98 + 102	1040		34.5	251	1.75	1.132	1
PCB 88	ND	U	43.1	62.8			1
PCB 91	11600		37.0	62.8	1.68	1.152	1
PCB 84	1080		46.8	46.8	1.77	1.164	1
PCB 89	ND	U	65.5	65.5			1
PCB 121	286		41.0	62.8	1.54	1.190	1
PCB 92	4010		61.4	62.8	1.60	0.982	1
PCBs 90 + 101 + 113	15000		52.5	251	1.56	1.001	1
PCBs 83 + 99	5850		59.0	126	1.57	1.018	1
PCB 112	ND	U	44.4	62.8			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	4480		49.6	251	1.55	1.034	1
PCBs 117 + 116	1320		43.9	126	1.63	1.055	1
PCB 85	1650		64.6	126	1.48	1.063	1
PCBs 110 + 115	4930		37.5	126	1.63	1.066	1
PCB 82	160		76.8	76.8	1.68	1.078	1
PCB 111	59.9**J**		42.0	62.8	1.64	1.084	1
PCB 120	ND	U	41.9	62.8			1
PCBs 108 + 124	ND	U	48.7	126			1
PCB 107	536		54.0	62.8	1.47	0.997	1
PCB 123	ND	U	45.2	45.2			1
PCB 106	ND	U	51.8	62.8			1
PCB 118	2480		44.5	44.5	1.64	1.001	1
PCB 122	ND	U	57.8	62.8			1
PCB 114	ND	U	45.9	45.9			1
PCB 105	684		46.9	46.9	1.50	1.000	1
PCB 127	ND	U	52.3	62.8			1
PCB 126	172**K**		42.1	42.1	2.98	1.001	1
PCB 155	149		34.9	34.9	1.42	1.002	1
PCB 152	663		22.1	62.8	1.37	1.014	1
PCB 150	558		18.2	62.8	1.41	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	4340		21.4	62.8	1.26	1.033	1
PCB 145	ND	U	19.9	62.8			1
PCB 148	425		28.0	62.8	1.08	1.085	1
PCB 151	7160		30.7	126	1.23	1.107	1
PCBs 135 + 154	2430		24.2	126	1.41	1.109	1
PCB 144	383**K**		26.5	62.8	1.71	1.125	1
PCBs 147 + 149	20800		47.6	126	1.26	0.892	1
PCB 134	520		47.7	126	1.09	0.898	1
PCB 143	ND	U	53.8	126			1
PCBs 139 + 140	ND	U	48.2	126			1
PCB 131	ND	U	47.2	62.8			1
PCB 142	ND	U	56.3	62.8			1
PCB 132	3780		55.7	62.8	1.19	0.927	1
PCB 133	914		56.1	62.8	1.16	0.936	1
PCB 165	ND	U	40.1	62.8			1
PCB 146	4200		50.3	62.8	1.27	0.952	1
PCB 161	ND	U	38.9	62.8			1
PCBs 153 + 168	15600		40.4	126	1.23	0.967	1
PCB 141	2330		52.2	62.8	1.19	0.974	1
PCB 130	437		64.2	64.2	1.24	0.985	1
PCB 137	ND	U	48.8	62.8			1
PCB 164	770**K**		40.3	62.8	0.94	0.994	1
PCBs 129 + 138 + 163	17100		58.7	251	1.24	1.001	1
PCB 160	ND	U	22.7	251			1
PCB 158	771		36.2	62.8	1.17	1.010	1
PCB 166	ND	U	40.5	126			1
PCB 128	715		50.4	126	1.09	1.035	1
PCB 159	134**K**		94.0	94.0	1.59	0.983	1
PCB 162	ND	U	84.9	84.9			1
PCB 167	245		75.1	75.1	1.15	1.001	1
PCBs 156 + 157	636		122	122	1.29	1.001	1
PCB 169	ND	U	73.6	73.6			1
PCB 188	250**K**		31.2	31.2	1.29	1.001	1
PCB 179	3380		22.5	62.8	1.00	1.014	1
PCB 184	ND	U	19.7	62.8			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	803		23.1	62.8	1.01	1.037	1
PCB 186	ND	U	21.8	62.8			1
PCB 178	1980		30.3	62.8	1.01	1.086	1
PCB 175	208		30.3	62.8	1.14	1.102	1
PCB 187	8740		27.0	62.8	1.03	1.110	1
PCB 182	ND	U	30.1	62.8			1
PCB 183	4380		79.8	126	0.98	1.126	1
PCB 185	840		74.1	126	1.04	1.131	1
PCB 174	6480		80.8	80.8	0.97	1.136	1
PCB 177	4760		88.0	88.0	0.98	1.148	1
PCB 181	ND	U	73.4	73.4			1
PCBs 171 + 173	2030		89.1	126	1.02	1.165	1
PCB 172	1300		92.3	92.3	0.95	0.898	1
PCB 192	ND	U	64.5	64.5			1
PCBs 180 + 193	14600		61.7	126	0.96	0.911	1
PCB 191	299		67.0	67.0	0.97	0.918	1
PCB 170	6690		92.0	92.0	0.96	0.938	1
PCB 190	1580		62.7	62.8	1.02	0.948	1
PCB 189	198		42.8	42.8	0.93	1.001	1
PCB 202	688		27.1	27.1	0.83	1.000	1
PCB 201	470		25.6	62.8	0.89	1.022	1
PCB 204	ND	U	25.8	62.8			1
PCB 197	157		23.7	126	0.90	1.043	1
PCB 200	455		26.3	126	0.80	1.048	1
PCBs 198 + 199	3480		34.8	126	0.89	1.114	1
PCB 196	2210		36.6	62.8	0.82	0.916	1
PCB 203	1920		30.0	62.8	0.82	0.920	1
PCB 195	1590		38.6	62.8	0.86	0.947	1
PCB 194	3710		36.6	62.8	0.88	0.992	1
PCB 205	198		26.8	26.8	0.83	1.001	1
PCB 208	141**K**		44.3	44.3	0.63	1.001	1
PCB 207	130		42.0	62.8	0.83	1.020	1
PCB 206	976		34.1	34.1	0.71	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	140		21.3	25.1	1.26	1.001	1
Total MonoCB	183		14.6	62.8			1
Total DiCB	4780		91.2	126			1
Total TriCB	34300		31.6	62.8			1
Total TetraCB	199000		21.7	251			1
Total PentaCB	81100		30.4	251			1
Total HexaCB	85100		18.2	251			1
Total HeptaCB	58500		19.7	126			1
Total OctaCB	14900		23.7	126			1
Total NonaCB	1250		34.1	62.8			1
Total PCBs	479000		14.6	251			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	Percent
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 20:16
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.313g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152213	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	607.356	30		5-145	3.41	0.746
PCB 3L	2000	671.238	34		5-145	3.36	0.872
PCB 4L	2000	461.522	23		5-145	1.68	0.888
PCB 15L	2000	796.599	40		5-145	1.57	1.239
PCB 19L	2000	575.619	29		5-145	1.18	1.072
PCB 37L	2000	1018.902	51		5-145	0.98	1.091
PCB 54L	2000	531.579	27		5-145	0.82	0.823
PCB 81L	2000	969.935	48		10-145	0.81	1.362
PCB 77L	2000	987.858	49		10-145	0.85	1.386
PCB 104L	2000	582.861	29		10-145	1.62	0.813
PCB 123L	2000	971.113	49		10-145	1.48	1.148
PCB 118L	2000	927.779	46		10-145	1.56	1.158
PCB 114L	2000	955.445	48		10-145	1.62	1.175
PCB 105L	2000	941.982	47		10-145	1.60	1.199
PCB 126L	2000	961.870	48		10-145	1.61	1.298
PCB 155L	2000	637.250	32		10-145	1.28	0.785
PCB 167L	2000	954.759	48		10-145	1.22	1.076
PCBs 156L + 157L	4000	1997.091	50		10-145	1.23	1.106
PCB 169L	2000	1016.940	51		10-145	1.20	1.190
PCB 188L	2000	577.072	29		10-145	1.08	0.713
PCB 189L	2000	943.284	47		10-145	1.05	0.959
PCB 202L	2000	702.057	35		10-145	0.85	0.818
PCB 205L	2000	912.563	46		10-145	0.85	1.009
PCB 208L	2000	703.710	35		10-145	0.81	0.947
PCB 206L	2000	957.316	48		10-145	0.77	1.042
PCB 209L	2000	1083.934	54		10-145	1.22	1.071
PCB 28L	4000	2475.275	62		5-145	1.01	0.926
PCB 111L	4000	1788.521	45		10-145	1.62	1.083
PCB 178L	4000	1555.055	39		10-145	1.14	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Units:**	ng/Kg
Lab Code:	K1411753-002	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	38.3	38.3	1	0.0003	
PCB 77	**117**	37.3	37.3	1	0.0001	0.0117
PCB 123	ND	45.2	45.2	1	0.00003	
PCB 118	**2480**	44.5	44.5	1	0.00003	0.0744
PCB 114	ND	45.9	45.9	1	0.00003	
PCB 105	**684**	46.9	46.9	1	0.00003	0.0205
PCB 126	**172**	42.1	42.1	1	0.1	17.2
PCB 167	**245**	75.1	75.1	1	0.00003	0.00735
PCBs 156 + 157	**636**	122	122	1	0.00003	0.0191
PCB 169	ND	73.6	73.6	1	0.03	
PCB 189	**198**	42.8	42.8	1	0.00003	0.00594
	Total TEQ					17.3

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	178		50.0	50.0	3.00	1.001	1
PCB 2	ND	U	44.0	44.0			1
PCB 3	185		39.7	39.7	3.31	1.000	1
PCB 4	ND	U	645	645	-		1
PCB 10	ND	U	290	290	-		1
PCB 9	ND	U	153	153	-		1
PCB 7	ND	U	139	139	-		1
PCB 6	346		150	150	-	1.157	1
PCB 5	ND	U	151	151	-		1
PCB 8	1210		142	142	-	1.185	1
PCB 14	ND	U	154	154	-		1
PCB 11	402		159	159	-	0.969	1
PCBs 12 + 13	ND	U	153	153	-		1
PCB 15	833		122	122	-	1.001	1
PCB 19	827		104	104	1.07	1.001	1
PCB 18	ND	U	56.5	57.9			1
PCB 30	1810		77.0	77.0	0.98	1.102	1
PCB 17	1150		79.0	79.0	0.91	1.123	1
PCB 27	362**K**		59.4	59.4	0.78	1.137	1
PCB 24	ND	U	53.1	53.1			1
PCB 16	541		90.9	90.9	0.95	1.154	1
PCB 32	3180		53.3	53.3	1.01	1.179	1
PCB 34	ND	U	39.6	39.6			1
PCB 23	ND	U	34.4	34.4			1
PCBs 26 + 29	764		36.7	57.9	0.93	1.274	1
PCB 25	428**K**		27.5	27.5	0.75	0.829	1
PCB 31	2730		33.7	57.9	1.04	0.841	1
PCBs 20 + 28	8650		64.5	64.5	1.00	0.851	1
PCBs 21 + 33	3370		52.8	57.9	0.99	0.861	1
PCB 22	775		36.0	36.0	0.89	0.877	1
PCB 36	ND	U	35.8	35.8			1
PCB 39	137		33.8	33.8	1.07	0.945	1
PCB 38	ND	U	39.8	39.8			1
PCB 35	ND	U	38.8	38.8			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	927		39.0	39.0	1.07	1.001	1
PCB 54	4100		51.7	51.7	0.77	1.002	1
PCBs 50 + 53	15000		46.2	116	0.77	0.908	1
PCBs 45 + 51	21600		47.4	57.9	0.74	0.936	1
PCB 46	862		57.5	57.5	0.78	0.949	1
PCB 52	22700		50.7	57.9	0.77	1.001	1
PCBs 43 + 73	ND	U	41.2	57.9			1
PCB 69	ND	U	28.5	116			1
PCB 49	26900		45.4	116	0.75	1.020	1
PCB 48	ND	U	45.6	57.9			1
PCBs 44 + 47 + 65	33800		39.8	116	0.75	1.040	1
PCBs 59 + 62 + 75	1250		35.1	116	0.70	1.051	1
PCB 42	1150		41.4	116	0.70	1.063	1
PCB 41	ND	U	59.2	116			1
PCBs 40 + 71	4550		43.3	116	0.76	1.083	1
PCB 64	1250		26.5	57.9	0.75	1.091	1
PCB 72	485		35.4	57.9	0.75	1.121	1
PCB 68	896		33.0	57.9	0.66	1.133	1
PCB 57	ND	U	38.9	57.9			1
PCB 58	ND	U	37.2	57.9			1
PCB 67	ND	U	33.9	57.9			1
PCB 63	249		38.4	57.9	0.80	1.177	1
PCB 61	ND	U	40.2	232			1
PCBs 70 + 74 + 76	8080		32.6	232	0.75	1.192	1
PCB 66	7420		48.3	57.9	0.74	1.206	1
PCB 55	ND	U	52.5	57.9			1
PCB 56	2140		54.4	57.9	0.79	0.907	1
PCB 60	272		52.4	57.9	0.82	0.913	1
PCB 80	ND	U	46.2	57.9			1
PCB 79	218		49.7	57.9	0.67	0.969	1
PCB 78	ND	U	56.2	57.9			1
PCB 81	ND	U	54.6	54.6			1
PCB 77	317**K**		47.8	47.8	0.63	1.001	1
PCB 104	1130**K**		47.5	47.5	1.94	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	1330		30.5	57.9	1.64	1.021	1
PCB 103	2010		37.1	57.9	1.58	1.089	1
PCB 94	1200		40.3	57.9	1.68	1.100	1
PCBs 95 + 100	17800		36.7	232	1.68	1.120	1
PCB 93	ND	U	43.5	232			1
PCBs 98 + 102	685		34.5	232	1.48	1.131	1
PCB 88	ND	U	43.1	57.9			1
PCB 91	8830		37.0	57.9	1.74	1.151	1
PCB 84	2190**K**		46.8	46.8	1.89	1.163	1
PCB 89	ND	U	159	159			1
PCB 121	267		99.2	99.2	1.36	1.188	1
PCB 92	6460		149	149	1.51	0.982	1
PCBs 90 + 101 + 113	24700		127	232	1.59	1.000	1
PCBs 83 + 99	11500		143	143	1.54	1.018	1
PCB 112	ND	U	108	108			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	7620		120	232	1.58	1.037	1
PCBs 117 + 116	827		107	116	1.49	1.056	1
PCB 85	2260		157	157	1.44	1.061	1
PCBs 110 + 115	12500		90.8	116	1.59	1.066	1
PCB 82	749		186	186	1.42	1.078	1
PCB 111	ND	U	102	102			1
PCB 120	ND	U	102	102			1
PCBs 108 + 124	ND	U	111	116			1
PCB 107	1240**K**		123	123	1.79	0.997	1
PCB 123	ND	U	121	121			1
PCB 106	ND	U	118	118			1
PCB 118	8410		98.7	98.7	1.53	1.000	1
PCB 122	ND	U	132	132			1
PCB 114	ND	U	110	110			1
PCB 105	2140		107	107	1.68	1.000	1
PCB 127	ND	U	119	119			1
PCB 126	648**K**		108	108	2.33	1.001	1
PCB 155	237		61.7	61.7	1.21	1.001	1
PCB 152	440		39.3	57.9	1.18	1.014	1
PCB 150	573		32.4	57.9	1.28	1.018	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	5660		38.0	57.9	1.24	1.033	1
PCB 145	ND	U	35.4	57.9			1
PCB 148	820**K**		49.7	57.9	1.45	1.084	1
PCB 151	13800		54.6	116	1.31	1.107	1
PCBs 135 + 154	5800		43.1	116	1.30	1.110	1
PCB 144	1360		47.1	57.9	1.19	1.125	1
PCBs 147 + 149	44500		120	120	1.24	0.893	1
PCB 134	1270		120	120	1.22	0.898	1
PCB 143	ND	U	135	135			1
PCBs 139 + 140	558		121	121	1.09	0.906	1
PCB 131	ND	U	119	119			1
PCB 142	ND	U	142	142			1
PCB 132	11700		140	140	1.25	0.927	1
PCB 133	2270		141	141	1.21	0.935	1
PCB 165	ND	U	101	101			1
PCB 146	12300		127	127	1.26	0.952	1
PCB 161	ND	U	97.5	97.5			1
PCBs 153 + 168	47800		102	116	1.24	0.966	1
PCB 141	9000		131	131	1.23	0.974	1
PCB 130	1600**K**		161	161	1.45	0.984	1
PCB 137	509**K**		123	123	1.52	0.990	1
PCB 164	2890		101	101	1.33	0.993	1
PCBs 129 + 138 + 163	46200		148	232	1.24	1.001	1
PCB 160	ND	U	57.0	232			1
PCB 158	2570		90.8	90.8	1.33	1.010	1
PCB 166	ND	U	102	116			1
PCB 128	2970		127	127	1.25	1.035	1
PCB 159	709		323	323	1.41	0.983	1
PCB 162	ND	U	292	292			1
PCB 167	796		247	247	1.23	1.001	1
PCBs 156 + 157	2670		433	433	1.31	0.999	1
PCB 169	ND	U	271	271			1
PCB 188	505		55.0	55.0	0.95	1.001	1
PCB 179	10700		40.4	57.9	1.04	1.014	1
PCB 184	ND	U	35.3	57.9			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	3040		41.4	57.9	1.01	1.037	1
PCB 186	ND	U	39.1	57.9			1
PCB 178	5770		54.4	57.9	1.01	1.086	1
PCB 175	689**K**		54.4	57.9	0.80	1.102	1
PCB 187	30000		48.5	57.9	1.04	1.110	1
PCB 182	ND	U	54.1	57.9			1
PCB 183	17300		86.7	116	0.96	1.126	1
PCB 185	3660		80.5	116	0.95	1.131	1
PCB 174	27600		87.8	87.8	0.95	1.137	1
PCB 177	18600		95.6	95.6	0.97	1.148	1
PCB 181	ND	U	79.7	79.7			1
PCBs 171 + 173	7760		96.8	116	0.97	1.165	1
PCB 172	4690		101	101	0.96	0.898	1
PCB 192	ND	U	70.1	70.1			1
PCBs 180 + 193	57900		67.0	116	0.95	0.911	1
PCB 191	937		72.8	72.8	0.89	0.918	1
PCB 170	26500		100	100	0.97	0.938	1
PCB 190	5830		68.2	68.2	0.96	0.948	1
PCB 189	598**K**		47.8	47.8	0.72	1.001	1
PCB 202	2280		43.1	43.1	0.81	1.000	1
PCB 201	1760		43.2	57.9	0.90	1.022	1
PCB 204	ND	U	43.5	57.9			1
PCB 197	581		39.9	116	0.89	1.042	1
PCB 200	1510		44.2	116	0.80	1.048	1
PCBs 198 + 199	12800		58.6	116	0.85	1.114	1
PCB 196	7470		61.6	61.6	0.84	0.916	1
PCB 203	7290		50.6	57.9	0.85	0.920	1
PCB 195	5510		65.0	65.0	0.81	0.947	1
PCB 194	13100		61.7	61.7	0.84	0.992	1
PCB 205	636		48.0	48.0	0.78	1.001	1
PCB 208	567		71.2	71.2	0.74	1.000	1
PCB 207	482		63.3	63.3	0.84	1.018	1
PCB 206	3590		85.4	85.4	0.79	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	461		44.9	44.9	1.12	1.000	1
Total MonoCB	363		39.7	57.9			1
Total DiCB	2790		122	122			1
Total TriCB	25600		27.5	57.9			1
Total TetraCB	153000		26.5	232			1
Total PentaCB	114000		30.5	232			1
Total HexaCB	219000		32.4	232			1
Total HeptaCB	222000		35.3	116			1
Total OctaCB	52900		39.9	116			1
Total NonaCB	4640		63.3	63.3			1
Total PCBs	796000		26.5	232			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	Percent
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 21:21
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.422g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152214	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	270.840	14		5-145	3.41	0.745
PCB 3L	2000	284.518	14		5-145	3.54	0.871
PCB 4L	2000	204.486	10		5-145	1.58	0.887
PCB 15L	2000	373.623	19		5-145	1.55	1.235
PCB 19L	2000	245.356	12		5-145	0.99	1.069
PCB 37L	2000	555.713	28		5-145	1.14	1.091
PCB 54L	2000	244.946	12		5-145	0.74	0.823
PCB 81L	2000	493.099	25		10-145	0.80	1.362
PCB 77L	2000	543.152	27		10-145	0.78	1.387
PCB 104L	2000	286.576	14		10-145	1.58	0.814
PCB 123L	2000	513.778	26		10-145	1.58	1.148
PCB 118L	2000	507.201	25		10-145	1.59	1.159
PCB 114L	2000	520.885	26		10-145	1.67	1.175
PCB 105L	2000	515.013	26		10-145	1.68	1.199
PCB 126L	2000	526.068	26		10-145	1.55	1.298
PCB 155L	2000	347.516	17		10-145	1.39	0.785
PCB 167L	2000	616.167	31		10-145	1.17	1.075
PCBs 156L + 157L	4000	1234.021	31		10-145	1.26	1.107
PCB 169L	2000	627.184	31		10-145	1.25	1.190
PCB 188L	2000	295.923	15		10-145	1.07	0.713
PCB 189L	2000	506.258	25		10-145	1.02	0.959
PCB 202L	2000	364.880	18		10-145	0.89	0.818
PCB 205L	2000	449.066	22		10-145	0.86	1.009
PCB 208L	2000	353.433	18		10-145	0.79	0.947
PCB 206L	2000	535.390	27		10-145	0.75	1.042
PCB 209L	2000	606.909	30		10-145	1.28	1.071
PCB 28L	4000	1401.428	35		5-145	1.01	0.927
PCB 111L	4000	1017.711	25		10-145	1.71	1.084
PCB 178L	4000	957.700	24		10-145	1.15	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Units:**	ng/Kg
Lab Code:	K1411753-003	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	54.6	54.6	1	0.0003	
PCB 77	**317**	47.8	47.8	1	0.0001	0.0317
PCB 123	ND	121	121	1	0.00003	
PCB 118	**8410**	98.7	98.7	1	0.00003	0.252
PCB 114	ND	110	110	1	0.00003	
PCB 105	**2140**	107	107	1	0.00003	0.0642
PCB 126	**648**	108	108	1	0.1	64.8
PCB 167	**796**	247	247	1	0.00003	0.0239
PCBs 156 + 157	**2670**	433	433	1	0.00003	0.0801
PCB 169	ND	271	271	1	0.03	
PCB 189	**598**	47.8	47.8	1	0.00003	0.0179
	Total TEQ					65.3

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	173		15.8	19.9	2.79	1.001	1
PCB 2	ND	U	14.3	19.9			1
PCB 3	32.3**K**		13.4	19.9	5.89	1.001	1
PCB 4	31400		271	271	-	1.001	1
PCB 10	451		176	176	-	1.011	1
PCB 9	ND	U	69.2	69.2	-		1
PCB 7	ND	U	63.1	63.1	-		1
PCB 6	329		67.9	67.9	-	1.158	1
PCB 5	ND	U	68.3	68.3	-		1
PCB 8	583		64.3	64.3	-	1.188	1
PCB 14	ND	U	69.8	69.8	-		1
PCB 11	862		71.9	99.5	-	0.973	1
PCBs 12 + 13	ND	U	69.1	69.1	-		1
PCB 15	306		78.0	78.0	-	1.001	1
PCB 19	95900**E**		67.9	67.9	1.02	1.001	1
PCB 18	ND	U	41.4	49.7			1
PCB 30	4680		56.4	56.4	1.08	1.102	1
PCB 17	37100		57.8	57.8	1.03	1.123	1
PCB 27	8240		43.4	43.4	1.03	1.138	1
PCB 24	ND	U	38.8	38.8			1
PCB 16	ND	U	66.5	66.5			1
PCB 32	12800		39.0	39.0	1.05	1.180	1
PCB 34	ND	U	255	255			1
PCB 23	ND	U	221	221			1
PCBs 26 + 29	2560		236	236	0.96	1.274	1
PCB 25	1620		177	177	1.07	0.830	1
PCB 31	2850		217	217	0.95	0.840	1
PCBs 20 + 28	12200		414	414	1.03	0.851	1
PCBs 21 + 33	3380**K**		339	339	0.78	0.858	1
PCB 22	ND	U	232	232			1
PCB 36	ND	U	230	230			1
PCB 39	ND	U	218	218			1
PCB 38	ND	U	256	256			1
PCB 35	ND	U	249	249			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	276	276			1
PCB 54	24500		38.5	38.5	0.80	1.002	1
PCBs 50 + 53	105000		51.2	99.5	0.76	0.907	1
PCBs 45 + 51	110000		52.6	52.6	0.76	0.935	1
PCB 46	5130		63.8	63.8	0.78	0.949	1
PCB 52	117000		56.3	56.3	0.74	1.001	1
PCBs 43 + 73	ND	U	45.7	49.7			1
PCB 69	ND	U	31.6	99.5			1
PCB 49	91100		50.4	99.5	0.76	1.020	1
PCB 48	ND	U	50.6	50.6			1
PCBs 44 + 47 + 65	148000		44.1	99.5	0.75	1.040	1
PCBs 59 + 62 + 75	3540		39.0	99.5	0.76	1.051	1
PCB 42	2280		46.0	99.5	0.75	1.062	1
PCB 41	ND	U	65.7	99.5			1
PCBs 40 + 71	15100		48.1	99.5	0.75	1.083	1
PCB 64	957		29.5	49.7	0.84	1.091	1
PCB 72	ND	U	39.3	49.7			1
PCB 68	590**K**		36.6	49.7	0.61	1.132	1
PCB 57	ND	U	43.1	49.7			1
PCB 58	ND	U	41.3	49.7			1
PCB 67	ND	U	37.7	49.7			1
PCB 63	ND	U	42.6	49.7			1
PCB 61	ND	U	44.6	199			1
PCBs 70 + 74 + 76	2710		36.1	199	0.78	1.192	1
PCB 66	3040		53.6	53.6	0.75	1.206	1
PCB 55	ND	U	58.3	58.3			1
PCB 56	239		44.8	49.7	0.65	0.907	1
PCB 60	ND	U	43.1	49.7			1
PCB 80	ND	U	38.0	49.7			1
PCB 79	ND	U	40.9	49.7			1
PCB 78	ND	U	46.2	49.7			1
PCB 81	ND	U	47.5	47.5			1
PCB 77	48.0**K**		36.8	36.8	1.40	1.000	1
PCB 104	3050		46.2	46.2	1.66	1.001	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	6250		24.0	49.7	1.70	1.021	1
PCB 103	6040		29.3	49.7	1.68	1.089	1
PCB 94	2400		31.8	49.7	1.63	1.100	1
PCBs 95 + 100	32000		28.9	199	1.74	1.120	1
PCB 93	ND	U	34.3	199			1
PCBs 98 + 102	1740		27.2	199	1.74	1.131	1
PCB 88	ND	U	34.0	49.7			1
PCB 91	20400		29.2	49.7	1.72	1.152	1
PCB 84	1720**K**		36.9	36.9	1.87	1.164	1
PCB 89	ND	U	102	102			1
PCB 121	696		63.8	63.8	1.54	1.189	1
PCB 92	4060		95.5	95.5	1.56	0.982	1
PCBs 90 + 101 + 113	15500		81.7	199	1.61	1.000	1
PCBs 83 + 99	8320		91.9	99.5	1.58	1.018	1
PCB 112	ND	U	69.0	69.0			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	6780		77.2	199	1.61	1.033	1
PCBs 117 + 116	1820		68.3	99.5	1.59	1.055	1
PCB 85	1650**K**		101	101	2.00	1.063	1
PCBs 110 + 115	5010		58.4	99.5	1.53	1.066	1
PCB 82	ND	U	120	120			1
PCB 111	ND	U	65.3	65.3			1
PCB 120	ND	U	65.3	65.3			1
PCBs 108 + 124	ND	U	110	110			1
PCB 107	557		121	121	1.58	0.997	1
PCB 123	ND	U	101	101			1
PCB 106	ND	U	117	117			1
PCB 118	1990		98.1	98.1	1.69	1.000	1
PCB 122	ND	U	130	130			1
PCB 114	ND	U	103	103			1
PCB 105	536**K**		99.7	99.7	1.81	1.000	1
PCB 127	ND	U	118	118			1
PCB 126	316**K**		96.8	96.8	2.78	1.001	1
PCB 155	300**K**		51.0	51.0	1.59	1.001	1
PCB 152	ND	U	32.8	49.7			1
PCB 150	1530**K**		27.0	49.7	0.75	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	5820		31.7	49.7	1.31	1.033	1
PCB 145	ND	U	29.5	49.7			1
PCB 148	562**K**		41.5	49.7	1.44	1.085	1
PCB 151	7590		45.6	99.5	1.18	1.107	1
PCBs 135 + 154	3510**K**		35.9	99.5	1.55	1.110	1
PCB 144	293**K**		39.3	49.7	1.46	1.124	1
PCBs 147 + 149	27300		42.6	99.5	1.28	0.892	1
PCB 134	555		42.7	99.5	1.36	0.899	1
PCB 143	ND	U	48.1	99.5			1
PCBs 139 + 140	ND	U	43.1	99.5			1
PCB 131	ND	U	42.2	49.7			1
PCB 142	ND	U	50.3	50.3			1
PCB 132	3570		49.8	49.8	1.12	0.927	1
PCB 133	1420		50.2	50.2	1.11	0.935	1
PCB 165	200**K**		35.9	49.7	0.56	0.945	1
PCB 146	4920		45.0	49.7	1.24	0.952	1
PCB 161	ND	U	34.8	49.7			1
PCBs 153 + 168	17400		36.2	99.5	1.25	0.966	1
PCB 141	2120		46.7	49.7	1.24	0.973	1
PCB 130	365		57.4	57.4	1.26	0.985	1
PCB 137	258**K**		43.6	49.7	1.02	0.989	1
PCB 164	822		36.0	49.7	1.25	0.993	1
PCBs 129 + 138 + 163	20000		52.5	199	1.24	1.000	1
PCB 160	ND	U	20.3	199			1
PCB 158	760		32.4	49.7	1.22	1.010	1
PCB 166	ND	U	36.3	99.5			1
PCB 128	565		45.1	99.5	1.13	1.035	1
PCB 159	196**K**		126	126	0.95	0.983	1
PCB 162	ND	U	114	114			1
PCB 167	259		96.0	96.0	1.16	1.001	1
PCBs 156 + 157	736		169	169	1.11	1.001	1
PCB 169	177**K**		101	101	2.15	1.000	1
PCB 188	598		41.3	41.3	1.17	1.000	1
PCB 179	4670		28.7	49.7	1.09	1.014	1
PCB 184	ND	U	25.1	49.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	927		29.4	49.7	1.03	1.037	1
PCB 186	ND	U	27.8	49.7			1
PCB 178	2850		38.7	49.7	1.01	1.086	1
PCB 175	228**K**		38.7	49.7	1.35	1.102	1
PCB 187	12400		34.5	49.7	1.03	1.110	1
PCB 182	ND	U	38.5	49.7			1
PCB 183	5800		54.2	99.5	0.96	1.126	1
PCB 185	1150		50.3	99.5	1.13	1.131	1
PCB 174	8250		54.9	54.9	0.94	1.136	1
PCB 177	6800		59.8	59.8	0.98	1.147	1
PCB 181	ND	U	49.8	49.8			1
PCBs 171 + 173	2740		60.5	99.5	1.00	1.164	1
PCB 172	1770		62.7	62.7	1.12	0.897	1
PCB 192	ND	U	43.8	49.7			1
PCBs 180 + 193	20600		41.9	99.5	0.96	0.911	1
PCB 191	414		45.5	49.7	1.02	0.917	1
PCB 170	9330		62.5	62.5	0.96	0.938	1
PCB 190	2220		42.6	49.7	0.99	0.948	1
PCB 189	263		28.1	28.1	0.96	1.000	1
PCB 202	1240		30.9	30.9	0.82	1.001	1
PCB 201	769		30.1	49.7	0.93	1.022	1
PCB 204	ND	U	30.3	49.7			1
PCB 197	263		27.8	99.5	0.96	1.043	1
PCB 200	709		30.8	99.5	0.90	1.048	1
PCBs 198 + 199	5970		40.8	99.5	0.91	1.115	1
PCB 196	3630		43.0	49.7	0.88	0.916	1
PCB 203	3420		35.3	49.7	0.91	0.920	1
PCB 195	2700		45.3	49.7	0.83	0.946	1
PCB 194	6530		43.0	49.7	0.85	0.992	1
PCB 205	324		32.6	32.6	0.89	1.000	1
PCB 208	330		35.5	35.5	0.67	1.000	1
PCB 207	259**K**		31.5	49.7	1.01	1.019	1
PCB 206	1940		45.9	45.9	0.74	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	147		34.4	34.4	1.29	1.001	1
Total MonoCB	206		13.4	49.7			1
Total DiCB	34000		63.1	99.5			1
Total TriCB	181000		38.8	49.7			1
Total TetraCB	629000		29.5	199			1
Total PentaCB	121000		24.0	199			1
Total HexaCB	101000		20.3	199			1
Total HeptaCB	81000		25.1	99.5			1
Total OctaCB	25600		27.8	99.5			1
Total NonaCB	2520		31.5	49.7			1
Total PCBs	1180000		13.4	199			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	Percent
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 22:26
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.420g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152215	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	765.246	38		5-145	3.47	0.746
PCB 3L	2000	861.796	43		5-145	3.34	0.872
PCB 4L	2000	555.664	28		5-145	1.76	0.888
PCB 15L	2000	967.671	48		5-145	1.56	1.238
PCB 19L	2000	534.155	27		5-145	1.02	1.072
PCB 37L	2000	1274.786	64		5-145	0.98	1.091
PCB 54L	2000	618.768	31		5-145	0.85	0.823
PCB 81L	2000	1036.679	52		10-145	0.84	1.362
PCB 77L	2000	1236.357	62		10-145	0.83	1.387
PCB 104L	2000	673.272	34		10-145	1.63	0.813
PCB 123L	2000	1226.793	61		10-145	1.53	1.148
PCB 118L	2000	1164.913	58		10-145	1.62	1.158
PCB 114L	2000	1184.263	59		10-145	1.68	1.175
PCB 105L	2000	1206.178	60		10-145	1.56	1.199
PCB 126L	2000	1174.362	59		10-145	1.54	1.297
PCB 155L	2000	747.678	37		10-145	1.32	0.785
PCB 167L	2000	1180.238	59		10-145	1.23	1.075
PCBs 156L + 157L	4000	2369.719	59		10-145	1.33	1.105
PCB 169L	2000	1188.796	59		10-145	1.16	1.190
PCB 188L	2000	648.756	32		10-145	1.11	0.713
PCB 189L	2000	1156.480	58		10-145	1.05	0.960
PCB 202L	2000	833.089	42		10-145	0.87	0.818
PCB 205L	2000	1036.440	52		10-145	0.83	1.009
PCB 208L	2000	735.095	37		10-145	0.76	0.947
PCB 206L	2000	1171.693	59		10-145	0.78	1.042
PCB 209L	2000	1382.065	69		10-145	1.22	1.071
PCB 28L	4000	3990.174	100		5-145	1.07	0.927
PCB 111L	4000	2584.654	65		10-145	1.62	1.084
PCB 178L	4000	2086.373	52		10-145	1.08	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Units:**	ng/Kg
Lab Code:	K1411753-004	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	47.5	47.5	1	0.0003	
PCB 77	**48.0**	36.8	36.8	1	0.0001	0.00480
PCB 123	ND	101	101	1	0.00003	
PCB 118	**1990**	98.1	98.1	1	0.00003	0.0597
PCB 114	ND	103	103	1	0.00003	
PCB 105	**536**	99.7	99.7	1	0.00003	0.0161
PCB 126	**316**	96.8	96.8	1	0.1	31.6
PCB 167	**259**	96.0	96.0	1	0.00003	0.00777
PCBs 156 + 157	**736**	169	169	1	0.00003	0.0221
PCB 169	**177**	101	101	1	0.03	5.31
PCB 189	**263**	28.1	28.1	1	0.00003	0.00789
		Total TEQ				37.0

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	43.9	43.9			1
PCB 2	ND	U	33.9	33.9			1
PCB 3	93.2		25.9	25.9	3.46	1.001	1
PCB 4	ND	U	458	458	-		1
PCB 10	ND	U	208	208	-		1
PCB 9	ND	U	132	132	-		1
PCB 7	ND	U	120	120	-		1
PCB 6	ND	U	130	130	-		1
PCB 5	ND	U	130	130	-		1
PCB 8	298		123	123	-	1.186	1
PCB 14	ND	U	133	133	-		1
PCB 11	ND	U	137	137	-		1
PCBs 12 + 13	ND	U	132	132	-		1
PCB 15	223		113	113	-	1.002	1
PCB 19	255		69.8	69.8	1.16	1.001	1
PCB 18	ND	U	38.2	60.7			1
PCB 30	792		52.0	60.7	1.05	1.102	1
PCB 17	360**K**		53.3	53.3	1.23	1.123	1
PCB 27	78.5**K**		40.1	40.1	1.31	1.137	1
PCB 24	ND	U	35.8	35.8			1
PCB 16	226		61.4	61.4	0.95	1.153	1
PCB 32	387		36.0	36.0	0.99	1.179	1
PCB 34	ND	U	32.4	32.4			1
PCB 23	ND	U	28.1	28.1			1
PCBs 26 + 29	462		30.0	60.7	0.93	1.274	1
PCB 25	158**K**		22.5	24.3	0.82	0.829	1
PCB 31	1380		27.6	60.7	0.94	0.841	1
PCBs 20 + 28	3170		52.8	60.7	1.01	0.851	1
PCBs 21 + 33	1210		43.2	60.7	1.12	0.861	1
PCB 22	434		29.5	29.5	1.01	0.877	1
PCB 36	ND	U	29.3	29.3			1
PCB 39	ND	U	27.7	27.7			1
PCB 38	ND	U	32.6	32.6			1
PCB 35	ND	U	31.7	31.7			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	371		33.5	33.5	1.00	1.001	1
PCB 54	249		43.6	43.6	0.80	1.002	1
PCBs 50 + 53	2620		38.8	121	0.78	0.907	1
PCBs 45 + 51	2130		39.8	60.7	0.75	0.936	1
PCB 46	205**K**		48.3	48.3	0.92	0.949	1
PCB 52	9780		42.6	60.7	0.76	1.001	1
PCBs 43 + 73	ND	U	34.6	60.7			1
PCB 69	ND	U	23.9	121			1
PCB 49	6940		38.1	121	0.78	1.019	1
PCB 48	316**K**		38.3	60.7	0.57	1.030	1
PCBs 44 + 47 + 65	5450		33.4	121	0.78	1.040	1
PCBs 59 + 62 + 75	321		29.5	121	0.83	1.051	1
PCB 42	455		34.8	121	0.71	1.062	1
PCB 41	263**K**		49.7	121	0.93	1.079	1
PCBs 40 + 71	1350		36.4	121	0.78	1.083	1
PCB 64	674		22.3	60.7	0.75	1.091	1
PCB 72	74.3**K**		29.7	60.7	0.57	1.121	1
PCB 68	91.8**K**		27.7	60.7	0.90	1.131	1
PCB 57	ND	U	32.6	60.7			1
PCB 58	ND	U	31.2	60.7			1
PCB 67	62.8		28.5	60.7	0.70	1.167	1
PCB 63	101		32.3	60.7	0.67	1.177	1
PCB 61	ND	U	33.8	243			1
PCBs 70 + 74 + 76	3650		27.3	243	0.77	1.192	1
PCB 66	3130		40.6	60.7	0.80	1.205	1
PCB 55	ND	U	44.1	60.7			1
PCB 56	1120		26.6	60.7	0.69	0.907	1
PCB 60	202**K**		25.6	60.7	0.56	0.913	1
PCB 80	ND	U	22.6	60.7			1
PCB 79	58.4**J**		24.3	60.7	0.82	0.970	1
PCB 78	ND	U	27.4	60.7			1
PCB 81	ND	U	31.2	31.2			1
PCB 77	167		21.2	24.3	0.78	1.001	1
PCB 104	104		42.7	42.7	1.44	1.001	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	273		26.2	60.7	1.77	1.021	1
PCB 103	834		31.9	60.7	1.66	1.088	1
PCB 94	97.4**K**		34.6	60.7	2.52	1.100	1
PCBs 95 + 100	6410		31.5	243	1.69	1.119	1
PCB 93	ND	U	37.3	243			1
PCBs 98 + 102	228**JK**		29.6	243	1.88	1.131	1
PCB 88	ND	U	37.1	60.7			1
PCB 91	2260		31.8	60.7	1.67	1.151	1
PCB 84	850		40.2	40.2	1.55	1.163	1
PCB 89	ND	U	41.5	60.7			1
PCB 121	67.4		26.0	60.7	1.56	1.189	1
PCB 92	2150		38.9	60.7	1.53	0.983	1
PCBs 90 + 101 + 113	8100		33.3	243	1.54	1.001	1
PCBs 83 + 99	4580		37.4	121	1.60	1.019	1
PCB 112	ND	U	28.1	60.7			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	3060		31.5	243	1.56	1.038	1
PCBs 117 + 116	122**K**		27.8	121	1.87	1.056	1
PCB 85	793		41.0	121	1.67	1.061	1
PCBs 110 + 115	4360		23.8	121	1.55	1.067	1
PCB 82	297**K**		48.7	60.7	1.80	1.079	1
PCB 111	ND	U	26.6	60.7			1
PCB 120	ND	U	26.6	60.7			1
PCBs 108 + 124	ND	U	54.8	121			1
PCB 107	539		60.7	60.7	1.62	0.998	1
PCB 123	ND	U	63.2	63.2			1
PCB 106	ND	U	58.3	60.7			1
PCB 118	3490		49.3	49.3	1.64	1.000	1
PCB 122	ND	U	65.1	65.1			1
PCB 114	ND	U	49.3	49.3			1
PCB 105	1050		51.6	51.6	1.49	1.000	1
PCB 127	ND	U	58.9	60.7			1
PCB 126	143**K**		49.0	49.0	2.33	1.001	1
PCB 155	ND	U	59.8	59.8			1
PCB 152	ND	U	38.2	60.7			1
PCB 150	221**K**		31.5	60.7	1.55	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	1620		37.0	60.7	1.36	1.034	1
PCB 145	ND	U	34.5	60.7			1
PCB 148	113		48.4	60.7	1.41	1.085	1
PCB 151	2370		53.1	121	1.27	1.108	1
PCBs 135 + 154	1650		41.9	121	1.33	1.111	1
PCB 144	153**K**		45.8	60.7	1.86	1.125	1
PCBs 147 + 149	9160		40.1	121	1.22	0.893	1
PCB 134	313		40.1	121	1.25	0.899	1
PCB 143	ND	U	45.2	121			1
PCBs 139 + 140	262		40.6	121	1.17	0.907	1
PCB 131	ND	U	39.7	60.7			1
PCB 142	ND	U	47.3	60.7			1
PCB 132	2350		46.8	60.7	1.27	0.927	1
PCB 133	521		47.2	60.7	1.30	0.935	1
PCB 165	48.6**JK**		33.8	60.7	2.09	0.945	1
PCB 146	2950		42.3	60.7	1.23	0.952	1
PCB 161	ND	U	32.7	60.7			1
PCBs 153 + 168	7700		34.0	121	1.27	0.966	1
PCB 141	943		43.9	60.7	1.18	0.973	1
PCB 130	428		54.0	60.7	1.08	0.985	1
PCB 137	125**K**		41.0	60.7	0.99	0.989	1
PCB 164	476		33.9	60.7	1.11	0.993	1
PCBs 129 + 138 + 163	6890		49.3	243	1.25	1.000	1
PCB 160	ND	U	19.1	243			1
PCB 158	394		30.4	60.7	1.21	1.010	1
PCB 166	ND	U	34.1	121			1
PCB 128	647		42.4	121	1.25	1.035	1
PCB 159	76.6**K**		30.4	60.7	1.00	0.983	1
PCB 162	ND	U	27.5	60.7			1
PCB 167	179		23.3	24.3	1.42	1.000	1
PCBs 156 + 157	533		41.4	48.6	1.22	1.000	1
PCB 169	ND	U	25.1	25.1			1
PCB 188	ND	U	48.1	48.1			1
PCB 179	1390		36.1	60.7	1.07	1.014	1
PCB 184	ND	U	31.6	60.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	353		37.0	60.7	0.98	1.037	1
PCB 186	ND	U	35.0	60.7			1
PCB 178	795		48.7	60.7	1.08	1.086	1
PCB 175	60.2**JK**		48.6	60.7	1.56	1.103	1
PCB 187	3620		43.4	60.7	1.05	1.110	1
PCB 182	ND	U	48.4	60.7			1
PCB 183	1570		90.7	121	1.09	1.127	1
PCB 185	279**K**		84.3	121	0.76	1.131	1
PCB 174	2600		91.9	91.9	1.03	1.136	1
PCB 177	2410		101	101	0.95	1.148	1
PCB 181	ND	U	83.4	83.4			1
PCBs 171 + 173	801		102	121	1.09	1.164	1
PCB 172	472		105	105	1.21	0.897	1
PCB 192	ND	U	73.3	73.3			1
PCBs 180 + 193	4840		70.1	121	0.98	0.911	1
PCB 191	97.4**K**		76.2	76.2	0.75	0.917	1
PCB 170	2320		105	105	0.96	0.938	1
PCB 190	509		71.3	71.3	0.97	0.948	1
PCB 189	ND	U	51.4	51.4			1
PCB 202	274		34.2	34.2	0.90	1.000	1
PCB 201	163		34.6	60.7	0.91	1.023	1
PCB 204	ND	U	34.9	60.7			1
PCB 197	53.9**JK**		31.9	121	0.66	1.043	1
PCB 200	170**K**		35.4	121	0.73	1.048	1
PCBs 198 + 199	1230		46.9	121	0.89	1.114	1
PCB 196	621		49.4	60.7	0.80	0.916	1
PCB 203	669		40.5	60.7	0.79	0.920	1
PCB 195	443		52.1	60.7	0.76	0.946	1
PCB 194	1140		49.4	60.7	0.87	0.991	1
PCB 205	53.2		38.9	38.9	0.83	1.000	1
PCB 208	123		58.5	58.5	0.67	1.000	1
PCB 207	ND	U	51.1	60.7			1
PCB 206	428**K**		46.6	46.6	0.59	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	182		38.4	38.4	1.11	1.000	1
Total MonoCB	93.2		25.9	60.7			1
Total DiCB	522		113	121			1
Total TriCB	9290		22.5	60.7			1
Total TetraCB	39400		21.2	243			1
Total PentaCB	39800		23.8	243			1
Total HexaCB	40100		19.1	243			1
Total HeptaCB	22100		31.6	121			1
Total OctaCB	4820		31.9	121			1
Total NonaCB	551		46.6	60.7			1
Total PCBs	157000		19.1	243			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	Percent
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 23:31
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.168g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152216	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	734.002	37		5-145	3.02	0.745
PCB 3L	2000	826.790	41		5-145	3.36	0.870
PCB 4L	2000	517.440	26		5-145	1.61	0.886
PCB 15L	2000	1026.995	51		5-145	1.60	1.232
PCB 19L	2000	568.320	28		5-145	0.95	1.068
PCB 37L	2000	1509.090	75		5-145	1.04	1.091
PCB 54L	2000	664.210	33		5-145	0.85	0.823
PCB 81L	2000	1104.947	55		10-145	0.85	1.362
PCB 77L	2000	1462.114	73		10-145	0.85	1.387
PCB 104L	2000	728.586	36		10-145	1.65	0.814
PCB 123L	2000	1207.084	60		10-145	1.63	1.149
PCB 118L	2000	1330.455	67		10-145	1.62	1.159
PCB 114L	2000	1351.693	68		10-145	1.60	1.176
PCB 105L	2000	1362.785	68		10-145	1.61	1.200
PCB 126L	2000	1398.924	70		10-145	1.51	1.298
PCB 155L	2000	968.859	48		10-145	1.25	0.785
PCB 167L	2000	1708.428	85		10-145	1.20	1.075
PCBs 156L + 157L	4000	3465.298	87		10-145	1.25	1.106
PCB 169L	2000	1776.786	89		10-145	1.20	1.189
PCB 188L	2000	705.008	35	**K**	10-145	1.22	0.713
PCB 189L	2000	1205.837	60		10-145	1.05	0.960
PCB 202L	2000	897.527	45		10-145	0.89	0.818
PCB 205L	2000	1091.292	55		10-145	0.84	1.009
PCB 208L	2000	776.764	39		10-145	0.88	0.947
PCB 206L	2000	1215.939	61		10-145	0.76	1.042
PCB 209L	2000	1399.414	70		10-145	1.20	1.071
PCB 28L	4000	3667.701	92		5-145	1.02	0.927
PCB 111L	4000	2298.376	57		10-145	1.67	1.086
PCB 178L	4000	2294.300	57		10-145	1.15	1.009

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Units:**	ng/Kg
Lab Code:	K1411753-005	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	31.2	31.2	1	0.0003	
PCB 77	**167**	21.2	24.3	1	0.0001	0.0167
PCB 123	ND	63.2	63.2	1	0.00003	
PCB 118	**3490**	49.3	49.3	1	0.00003	0.105
PCB 114	ND	49.3	49.3	1	0.00003	
PCB 105	**1050**	51.6	51.6	1	0.00003	0.0315
PCB 126	**143**	49.0	49.0	1	0.1	14.3
PCB 167	**179**	23.3	24.3	1	0.00003	0.00537
PCBs 156 + 157	**533**	41.4	48.6	1	0.00003	0.0160
PCB 169	ND	25.1	25.1	1	0.03	
PCB 189	ND	51.4	51.4	1	0.00003	
	Total TEQ					14.5

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	182		37.1	37.1	2.68	1.000	1
PCB 2	ND	U	25.0	25.0			1
PCB 3	43.2**K**		14.6	19.0	2.63	1.001	1
PCB 4	29600		343	343	-	1.001	1
PCB 10	ND	U	150	150	-		1
PCB 9	ND	U	68.7	68.7	-		1
PCB 7	164		62.7	62.7	-	1.139	1
PCB 6	296		67.5	67.5	-	1.157	1
PCB 5	ND	U	67.9	67.9	-		1
PCB 8	879		63.9	63.9	-	1.185	1
PCB 14	ND	U	69.4	69.4	-		1
PCB 11	1410		71.5	94.9	-	0.973	1
PCBs 12 + 13	ND	U	68.7	68.7	-		1
PCB 15	136		54.3	54.3	-	1.001	1
PCB 19	116000**E**		43.6	43.6	1.01	1.001	1
PCB 18	ND	U	23.9	47.4			1
PCB 30	4030		32.5	47.4	1.03	1.100	1
PCB 17	50500		33.3	33.3	1.04	1.120	1
PCB 27	10900		25.1	25.1	1.04	1.134	1
PCB 24	ND	U	22.4	22.4			1
PCB 16	257**K**		38.4	38.4	0.83	1.150	1
PCB 32	13400		22.5	22.5	1.05	1.176	1
PCB 34	ND	U	50.3	50.3			1
PCB 23	ND	U	43.7	43.7			1
PCBs 26 + 29	1710		46.6	47.4	0.98	1.270	1
PCB 25	1070		35.0	35.0	0.95	0.830	1
PCB 31	2410		42.8	47.4	1.01	0.841	1
PCBs 20 + 28	12400		81.9	81.9	0.98	0.851	1
PCBs 21 + 33	4250		67.0	67.0	0.98	0.859	1
PCB 22	138		45.8	45.8	1.18	0.877	1
PCB 36	1150		45.5	45.5	0.94	0.936	1
PCB 39	ND	U	43.0	43.0			1
PCB 38	ND	U	50.6	50.6			1
PCB 35	ND	U	49.3	49.3			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	117		52.4	52.4	0.95	1.001	1
PCB 54	27700		30.2	30.2	0.79	1.002	1
PCBs 50 + 53	50300		24.9	94.9	0.75	0.908	1
PCBs 45 + 51	102000		25.6	47.4	0.77	0.936	1
PCB 46	1790		31.0	31.0	0.79	0.949	1
PCB 52	41000		27.3	47.4	0.76	1.001	1
PCBs 43 + 73	ND	U	22.2	47.4			1
PCB 69	ND	U	15.4	94.9			1
PCB 49	48200		24.5	94.9	0.75	1.020	1
PCB 48	ND	U	24.6	47.4			1
PCBs 44 + 47 + 65	141000		21.4	94.9	0.77	1.041	1
PCBs 59 + 62 + 75	3620		18.9	94.9	0.76	1.051	1
PCB 42	1110		22.3	94.9	0.77	1.064	1
PCB 41	ND	U	31.9	94.9			1
PCBs 40 + 71	9880		23.3	94.9	0.74	1.083	1
PCB 64	696		14.3	47.4	0.76	1.091	1
PCB 72	198**K**		19.1	47.4	1.04	1.122	1
PCB 68	780		17.8	47.4	0.80	1.133	1
PCB 57	ND	U	20.9	47.4			1
PCB 58	ND	U	20.0	47.4			1
PCB 67	ND	U	18.3	47.4			1
PCB 63	220		20.7	47.4	0.83	1.178	1
PCB 61	ND	U	21.7	190			1
PCBs 70 + 74 + 76	2370		17.5	190	0.79	1.192	1
PCB 66	3200		26.0	47.4	0.75	1.205	1
PCB 55	ND	U	28.3	47.4			1
PCB 56	202		43.7	47.4	0.84	0.907	1
PCB 60	ND	U	42.2	47.4			1
PCB 80	ND	U	37.2	47.4			1
PCB 79	ND	U	40.0	47.4			1
PCB 78	ND	U	45.2	47.4			1
PCB 81	84.6**K**		48.8	48.8	3.87	1.001	1
PCB 77	112**K**		37.8	37.8	1.64	1.000	1
PCB 104	3220		33.4	33.4	1.68	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 96	3710		19.5	47.4	1.65	1.021	1
PCB 103	5370		23.7	47.4	1.63	1.089	1
PCB 94	2940		25.8	47.4	1.76	1.101	1
PCBs 95 + 100	33500		23.5	190	1.70	1.120	1
PCB 93	ND	U	27.8	190			1
PCBs 98 + 102	2190		22.1	190	1.76	1.130	1
PCB 88	ND	U	27.6	47.4			1
PCB 91	23800		23.7	47.4	1.73	1.151	1
PCB 84	1320		29.9	29.9	1.76	1.162	1
PCB 89	ND	U	98.2	98.2			1
PCB 121	888		61.5	61.5	1.52	1.188	1
PCB 92	5310		92.1	92.1	1.56	0.983	1
PCBs 90 + 101 + 113	21500		78.7	190	1.60	1.000	1
PCBs 83 + 99	13500		88.5	94.9	1.58	1.019	1
PCB 112	ND	U	66.5	66.5			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	9340		74.4	190	1.56	1.034	1
PCBs 117 + 116	2670		65.8	94.9	1.53	1.055	1
PCB 85	ND	U	96.9	96.9			1
PCBs 110 + 115	5920		56.3	94.9	1.56	1.067	1
PCB 82	ND	U	116	116			1
PCB 111	139		63.0	63.0	1.32	1.086	1
PCB 120	369		62.9	62.9	1.64	1.096	1
PCBs 108 + 124	59.3**JK**		20.0	94.9	1.97	0.991	1
PCB 107	919		22.1	47.4	1.51	0.997	1
PCB 123	ND	U	21.1	21.1			1
PCB 106	ND	U	21.2	47.4			1
PCB 118	2270		18.0	19.0	1.60	1.001	1
PCB 122	54.9**K**		23.7	47.4	3.59	1.012	1
PCB 114	109		19.7	19.7	1.33	1.000	1
PCB 105	480**K**		17.7	19.0	1.29	1.000	1
PCB 127	22.9**JK**		21.5	47.4	1.26	1.038	1
PCB 126	729**K**		20.3	20.3	2.90	1.001	1
PCB 155	890**K**		30.8	30.8	1.45	1.001	1
PCB 152	1720		18.9	47.4	1.27	1.014	1
PCB 150	2460		15.6	47.4	1.29	1.017	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 136	6990		18.3	47.4	1.32	1.033	1
PCB 145	ND	U	17.0	47.4			1
PCB 148	876		23.9	47.4	1.27	1.084	1
PCB 151	11300		26.3	94.9	1.27	1.107	1
PCBs 135 + 154	6700		20.7	94.9	1.30	1.111	1
PCB 144	680**K**		22.7	47.4	1.47	1.125	1
PCBs 147 + 149	47700		215	215	1.27	0.892	1
PCB 134	1130		215	215	1.17	0.898	1
PCB 143	ND	U	243	243			1
PCBs 139 + 140	560		218	218	1.19	0.906	1
PCB 131	ND	U	213	213			1
PCB 142	ND	U	254	254			1
PCB 132	4530		251	251	1.21	0.927	1
PCB 133	2300		253	253	1.27	0.935	1
PCB 165	552**K**		181	181	0.62	0.945	1
PCB 146	6340		227	227	1.23	0.952	1
PCB 161	ND	U	175	175			1
PCBs 153 + 168	26100		183	183	1.26	0.966	1
PCB 141	3860		236	236	1.26	0.974	1
PCB 130	587		290	290	1.29	0.984	1
PCB 137	572		220	220	1.16	0.989	1
PCB 164	1450		182	182	1.19	0.993	1
PCBs 129 + 138 + 163	24700		265	265	1.27	1.000	1
PCB 160	ND	U	103	190			1
PCB 158	1260		163	163	1.28	1.009	1
PCB 166	ND	U	183	183			1
PCB 128	831		227	227	1.21	1.034	1
PCB 159	443		72.6	72.6	1.20	0.983	1
PCB 162	ND	U	65.5	65.5			1
PCB 167	440		53.5	53.5	1.21	1.000	1
PCBs 156 + 157	937		99.2	99.2	1.21	0.999	1
PCB 169	428**K**		59.8	59.8	2.21	1.000	1
PCB 188	1630		31.5	31.5	1.01	1.000	1
PCB 179	10300		23.3	47.4	1.05	1.014	1
PCB 184	37.7**JK**		20.3	47.4	0.71	1.024	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 176	2030		23.9	47.4	1.11	1.037	1
PCB 186	ND	U	22.5	47.4			1
PCB 178	4920		31.4	47.4	1.01	1.085	1
PCB 175	463		31.3	47.4	1.17	1.102	1
PCB 187	19800		27.9	47.4	1.07	1.110	1
PCB 182	ND	U	31.2	47.4			1
PCB 183	12800		91.7	94.9	0.98	1.126	1
PCB 185	2020		85.2	94.9	1.03	1.131	1
PCB 174	16100		92.9	92.9	0.96	1.136	1
PCB 177	10200		102	102	0.97	1.147	1
PCB 181	163**K**		84.4	84.4	0.81	1.156	1
PCBs 171 + 173	5050		103	103	0.94	1.164	1
PCB 172	3010		107	107	0.98	0.897	1
PCB 192	ND	U	74.2	74.2			1
PCBs 180 + 193	34200		70.9	94.9	0.96	0.911	1
PCB 191	630		77.0	77.0	0.98	0.918	1
PCB 170	14000		106	106	0.98	0.938	1
PCB 190	3220		72.1	72.1	1.01	0.948	1
PCB 189	367		51.3	51.3	1.04	1.000	1
PCB 202	2550		26.6	26.6	0.87	1.000	1
PCB 201	1520		27.0	47.4	0.86	1.022	1
PCB 204	ND	U	27.3	47.4			1
PCB 197	504		25.0	94.9	0.78	1.043	1
PCB 200	1230		27.7	94.9	0.90	1.048	1
PCBs 198 + 199	9240		36.7	94.9	0.86	1.114	1
PCB 196	5420		38.6	47.4	0.84	0.916	1
PCB 203	5560		31.7	47.4	0.86	0.920	1
PCB 195	3770		40.7	47.4	0.87	0.947	1
PCB 194	9300		38.6	47.4	0.85	0.992	1
PCB 205	473		30.5	30.5	0.82	1.000	1
PCB 208	474		39.0	39.0	0.79	1.001	1
PCB 207	364		34.4	47.4	0.80	1.019	1
PCB 206	2670		39.6	39.6	0.78	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 209	129	**K**	26.3	26.3	1.48	1.001	1
Total MonoCB	225		14.6	47.4			1
Total DiCB	32500		54.3	94.9			1
Total TriCB	218000		22.4	47.4			1
Total TetraCB	435000		14.3	190			1
Total PentaCB	140000		17.7	190			1
Total HexaCB	156000		15.6	190			1
Total HeptaCB	141000		20.3	94.9			1
Total OctaCB	39600		25.0	94.9			1
Total NonaCB	3510		34.4	47.4			1
Total PCBs	1170000		14.3	190			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	Percent
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 00:36
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.351g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152217	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	808.177	40		5-145	2.94	0.746
PCB 3L	2000	871.707	44		5-145	3.26	0.870
PCB 4L	2000	555.030	28		5-145	1.73	0.886
PCB 15L	2000	1057.075	53		5-145	1.66	1.229
PCB 19L	2000	514.531	26		5-145	1.03	1.068
PCB 37L	2000	1421.821	71		5-145	1.14	1.091
PCB 54L	2000	684.242	34		5-145	0.83	0.824
PCB 81L	2000	1177.861	59		10-145	0.79	1.362
PCB 77L	2000	1406.791	70		10-145	0.81	1.388
PCB 104L	2000	689.201	34		10-145	1.60	0.814
PCB 123L	2000	1306.702	65		10-145	1.54	1.149
PCB 118L	2000	1388.604	69		10-145	1.57	1.159
PCB 114L	2000	1417.706	71		10-145	1.68	1.176
PCB 105L	2000	1413.583	71		10-145	1.61	1.200
PCB 126L	2000	1326.340	66		10-145	1.66	1.298
PCB 155L	2000	881.868	44		10-145	1.39	0.785
PCB 167L	2000	1616.431	81		10-145	1.19	1.075
PCBs 156L + 157L	4000	3282.511	82		10-145	1.25	1.107
PCB 169L	2000	1696.957	85		10-145	1.28	1.189
PCB 188L	2000	686.409	34		10-145	1.09	0.714
PCB 189L	2000	1236.825	62		10-145	1.04	0.960
PCB 202L	2000	871.493	44		10-145	0.88	0.818
PCB 205L	2000	1089.601	54		10-145	0.82	1.009
PCB 208L	2000	773.898	39		10-145	0.79	0.947
PCB 206L	2000	1234.505	62		10-145	0.80	1.042
PCB 209L	2000	1419.504	71		10-145	1.19	1.071
PCB 28L	4000	3207.557	80		5-145	0.98	0.928
PCB 111L	4000	2028.245	51		10-145	1.56	1.085
PCB 178L	4000	1885.315	47		10-145	1.14	1.009

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Units:**	ng/Kg
Lab Code:	K1411753-006	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	**84.6**	48.8	48.8	1	0.0003	0.0254
PCB 77	**112**	37.8	37.8	1	0.0001	0.0112
PCB 123	ND	21.1	21.1	1	0.00003	
PCB 118	**2270**	18.0	19.0	1	0.00003	0.0681
PCB 114	**109**	19.7	19.7	1	0.00003	0.00327
PCB 105	**480**	17.7	19.0	1	0.00003	0.0144
PCB 126	**729**	20.3	20.3	1	0.1	72.9
PCB 167	**440**	53.5	53.5	1	0.00003	0.0132
PCBs 156 + 157	**937**	99.2	99.2	1	0.00003	0.0281
PCB 169	**428**	59.8	59.8	1	0.03	12.8
PCB 189	**367**	51.3	51.3	1	0.00003	0.0110
	Total TEQ					85.9

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	57.3	57.3			1
PCB 2	ND	U	38.0	38.0			1
PCB 3	ND	U	20.6	20.6			1
PCB 4	ND	U	752	752	-		1
PCB 10	ND	U	290	290	-		1
PCB 9	ND	U	119	119	-		1
PCB 7	ND	U	108	108	-		1
PCB 6	ND	U	117	117	-		1
PCB 5	ND	U	117	117	-		1
PCB 8	ND	U	111	111	-		1
PCB 14	ND	U	120	120	-		1
PCB 11	242		124	124	-	0.969	1
PCBs 12 + 13	ND	U	119	119	-		1
PCB 15	ND	U	74.3	74.3	-		1
PCB 19	65.9**K**		37.9	37.9	1.37	1.002	1
PCB 18	ND	U	28.3	51.4			1
PCB 30	ND	U	38.5	51.4			1
PCB 17	ND	U	39.5	39.5			1
PCB 27	ND	U	29.7	29.7			1
PCB 24	ND	U	26.6	26.6			1
PCB 16	ND	U	45.5	45.5			1
PCB 32	ND	U	26.7	26.7			1
PCB 34	ND	U	20.4	20.6			1
PCB 23	ND	U	17.7	20.6			1
PCBs 26 + 29	ND	U	18.9	51.4			1
PCB 25	ND	U	14.2	20.6			1
PCB 31	ND	U	17.4	51.4			1
PCBs 20 + 28	ND	U	33.2	51.4			1
PCBs 21 + 33	ND	U	27.2	51.4			1
PCB 22	ND	U	18.6	20.6			1
PCB 36	ND	U	18.5	20.6			1
PCB 39	ND	U	17.5	20.6			1
PCB 38	ND	U	20.5	20.6			1
PCB 35	ND	U	20.0	20.6			1
PCB 37	ND	U	23.8	23.8			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	ND	U	35.4	35.4			1
PCBs 50 + 53	ND	U	26.0	103			1
PCBs 45 + 51	31.5**J**		26.7	51.4	0.74	0.936	1
PCB 46	ND	U	32.3	32.3			1
PCB 52	32.4**BJ**		28.5	51.4	0.77	1.000	1
PCBs 43 + 73	ND	U	23.2	51.4			1
PCB 69	ND	U	16.0	103			1
PCB 49	ND	U	25.5	103			1
PCB 48	ND	U	25.6	51.4			1
PCBs 44 + 47 + 65	67.1**BJ**		22.4	103	0.71	1.039	1
PCBs 59 + 62 + 75	ND	U	19.8	103			1
PCB 42	ND	U	23.3	103			1
PCB 41	ND	U	33.3	103			1
PCBs 40 + 71	ND	U	24.4	103			1
PCB 64	ND	U	14.9	51.4			1
PCB 72	ND	U	19.9	51.4			1
PCB 68	ND	U	18.6	51.4			1
PCB 57	ND	U	21.9	51.4			1
PCB 58	ND	U	20.9	51.4			1
PCB 67	ND	U	19.1	51.4			1
PCB 63	ND	U	21.6	51.4			1
PCB 61	ND	U	22.6	206			1
PCBs 70 + 74 + 76	ND	U	18.3	206			1
PCB 66	ND	U	27.2	51.4			1
PCB 55	ND	U	29.5	51.4			1
PCB 56	ND	U	16.7	51.4			1
PCB 60	ND	U	16.1	51.4			1
PCB 80	ND	U	14.2	51.4			1
PCB 79	ND	U	15.2	51.4			1
PCB 78	ND	U	17.2	51.4			1
PCB 81	ND	U	17.5	20.6			1
PCB 77	ND	U	15.0	20.6			1
PCB 104	ND	U	35.5	35.5			1
PCB 96	ND	U	21.5	51.4			1
PCB 103	ND	U	26.2	51.4			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	28.5	51.4			1
PCBs 95 + 100	ND	U	25.9	206			1
PCB 93	ND	U	30.7	206			1
PCBs 98 + 102	ND	U	24.4	206			1
PCB 88	ND	U	30.5	51.4			1
PCB 91	ND	U	26.1	51.4			1
PCB 84	ND	U	33.1	33.1			1
PCB 89	ND	U	37.4	51.4			1
PCB 121	ND	U	23.4	51.4			1
PCB 92	ND	U	35.1	51.4			1
PCBs 90 + 101 + 113	ND	U	30.0	206			1
PCBs 83 + 99	ND	U	33.7	103			1
PCB 112	ND	U	25.4	51.4			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	ND	U	28.4	206			1
PCBs 117 + 116	ND	U	25.1	103			1
PCB 85	ND	U	36.9	103			1
PCBs 110 + 115	ND	U	21.5	103			1
PCB 82	ND	U	43.9	51.4			1
PCB 111	ND	U	24.0	51.4			1
PCB 120	ND	U	24.0	51.4			1
PCBs 108 + 124	ND	U	17.8	103			1
PCB 107	ND	U	19.7	51.4			1
PCB 123	ND	U	21.1	21.1			1
PCB 106	ND	U	18.9	51.4			1
PCB 118	ND	U	15.6	20.6			1
PCB 122	ND	U	21.1	51.4			1
PCB 114	ND	U	16.2	20.6			1
PCB 105	ND	U	17.5	20.6			1
PCB 127	ND	U	19.1	51.4			1
PCB 126	ND	U	17.5	20.6			1
PCB 155	ND	U	33.9	33.9			1
PCB 152	ND	U	21.2	51.4			1
PCB 150	ND	U	17.4	51.4			1
PCB 136	ND	U	20.5	51.4			1
PCB 145	ND	U	19.1	51.4			1
PCB 148	ND	U	26.8	51.4			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	ND	U	29.4	103			1
PCBs 135 + 154	ND	U	23.2	103			1
PCB 144	ND	U	25.4	51.4			1
PCBs 147 + 149	ND	U	25.0	103			1
PCB 134	ND	U	25.0	103			1
PCB 143	ND	U	28.2	103			1
PCBs 139 + 140	ND	U	25.3	103			1
PCB 131	ND	U	24.7	51.4			1
PCB 142	ND	U	29.5	51.4			1
PCB 132	ND	U	29.2	51.4			1
PCB 133	ND	U	29.4	51.4			1
PCB 165	ND	U	21.0	51.4			1
PCB 146	ND	U	26.4	51.4			1
PCB 161	ND	U	20.4	51.4			1
PCBs 153 + 168	ND	U	21.2	103			1
PCB 141	ND	U	27.4	51.4			1
PCB 130	ND	U	33.6	51.4			1
PCB 137	ND	U	25.6	51.4			1
PCB 164	ND	U	21.1	51.4			1
PCBs 129 + 138 + 163	ND	U	30.7	206			1
PCB 160	ND	U	11.9	206			1
PCB 158	ND	U	19.0	51.4			1
PCB 166	ND	U	21.3	103			1
PCB 128	ND	U	26.4	103			1
PCB 159	ND	U	27.3	51.4			1
PCB 162	ND	U	24.7	51.4			1
PCB 167	ND	U	19.8	20.6			1
PCBs 156 + 157	ND	U	37.4	41.1			1
PCB 169	ND	U	23.0	23.0			1
PCB 188	ND	U	30.6	30.6			1
PCB 179	ND	U	22.5	51.4			1
PCB 184	ND	U	19.7	51.4			1
PCB 176	ND	U	23.1	51.4			1
PCB 186	ND	U	21.8	51.4			1
PCB 178	ND	U	30.3	51.4			1
PCB 175	ND	U	30.3	51.4			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	27.0	51.4			1
PCB 182	ND	U	30.1	51.4			1
PCB 183	ND	U	49.4	103			1
PCB 185	ND	U	45.8	103			1
PCB 174	ND	U	50.0	51.4			1
PCB 177	ND	U	54.5	54.5			1
PCB 181	ND	U	45.4	51.4			1
PCBs 171 + 173	ND	U	55.1	103			1
PCB 172	ND	U	57.1	57.1			1
PCB 192	ND	U	39.9	51.4			1
PCBs 180 + 193	ND	U	38.2	103			1
PCB 191	ND	U	41.5	51.4			1
PCB 170	ND	U	57.0	57.0			1
PCB 190	ND	U	38.8	51.4			1
PCB 189	ND	U	27.3	27.3			1
PCB 202	ND	U	31.4	31.4			1
PCB 201	ND	U	29.4	51.4			1
PCB 204	ND	U	29.6	51.4			1
PCB 197	ND	U	27.1	103			1
PCB 200	ND	U	30.1	103			1
PCBs 198 + 199	ND	U	39.8	103			1
PCB 196	ND	U	41.9	51.4			1
PCB 203	ND	U	34.4	51.4			1
PCB 195	ND	U	44.2	51.4			1
PCB 194	ND	U	42.0	51.4			1
PCB 205	ND	U	30.3	30.3			1
PCB 208	ND	U	49.9	49.9			1
PCB 207	ND	U	43.8	51.4			1
PCB 206	ND	U	45.7	45.7			1
PCB 209	ND	U	31.8	31.8			1
Total MonoCB	ND	U	20.6	51.4			1
Total DiCB	242		74.3	103			1
Total TriCB	65.9		14.2	51.4			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total TetraCB	131**J**		14.2	206			1
Total PentaCB	ND	U	15.6	206			1
Total HexaCB	ND	U	11.9	206			1
Total HeptaCB	ND	U	19.7	103			1
Total OctaCB	ND	U	27.1	103			1
Total NonaCB	ND	U	43.8	51.4			1
Total PCBs	439		11.9	206			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	Percent
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 01:40
Prep Method:	Method	**Date Extracted:**	1/22/15
Sample Amount:	1.462g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152218	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	813.705	41		5-145	2.94	0.743
PCB 3L	2000	840.256	42		5-145	3.27	0.865
PCB 4L	2000	610.528	31		5-145	1.77	0.882
PCB 15L	2000	1126.692	56		5-145	1.61	1.218
PCB 19L	2000	727.370	36		5-145	1.01	1.059
PCB 37L	2000	1401.708	70		5-145	0.99	1.091
PCB 54L	2000	714.937	36		5-145	0.77	0.824
PCB 81L	2000	1336.384	67		10-145	0.81	1.361
PCB 77L	2000	1551.632	78		10-145	0.83	1.386
PCB 104L	2000	749.858	37		10-145	1.48	0.814
PCB 123L	2000	1276.494	64		10-145	1.60	1.149
PCB 118L	2000	1446.532	72		10-145	1.54	1.159
PCB 114L	2000	1484.074	74		10-145	1.74	1.176
PCB 105L	2000	1462.318	73		10-145	1.63	1.200
PCB 126L	2000	1422.639	71		10-145	1.59	1.298
PCB 155L	2000	1283.393	64		10-145	1.35	0.784
PCB 167L	2000	2296.413	115		10-145	1.28	1.075
PCBs 156L + 157L	4000	4670.688	117		10-145	1.18	1.107
PCB 169L	2000	2313.855	116		10-145	1.26	1.188
PCB 188L	2000	730.181	37		10-145	1.13	0.714
PCB 189L	2000	1260.192	63		10-145	1.00	0.959
PCB 202L	2000	835.311	42		10-145	0.89	0.819
PCB 205L	2000	1194.449	60		10-145	0.86	1.009
PCB 208L	2000	804.065	40		10-145	0.84	0.947
PCB 206L	2000	1258.363	63		10-145	0.80	1.042
PCB 209L	2000	1429.567	71		10-145	1.14	1.071
PCB 28L	4000	4464.998	112		5-145	1.14	0.927
PCB 111L	4000	2663.557	67		10-145	1.69	1.084
PCB 178L	4000	3209.230	80		10-145	1.17	1.009

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Units:**	ng/Kg
Lab Code:	K1411753-007	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	17.5	20.6	1	0.0003	
PCB 77	ND	15.0	20.6	1	0.0001	
PCB 123	ND	21.1	21.1	1	0.00003	
PCB 118	ND	15.6	20.6	1	0.00003	
PCB 114	ND	16.2	20.6	1	0.00003	
PCB 105	ND	17.5	20.6	1	0.00003	
PCB 126	ND	17.5	20.6	1	0.1	
PCB 167	ND	19.8	20.6	1	0.00003	
PCBs 156 + 157	ND	37.4	41.1	1	0.00003	
PCB 169	ND	23.0	23.0	1	0.03	
PCB 189	ND	27.3	27.3	1	0.00003	
	Total TEQ					0.00

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	54.6	54.6			1
PCB 2	ND	U	41.5	41.5			1
PCB 3	ND	U	31.2	31.2			1
PCB 4	ND	U	227	227	-		1
PCB 10	ND	U	98.4	98.4	-		1
PCB 9	ND	U	86.9	86.9	-		1
PCB 7	ND	U	79.2	79.2	-		1
PCB 6	ND	U	85.3	85.3	-		1
PCB 5	ND	U	85.9	85.9	-		1
PCB 8	ND	U	80.8	80.8	-		1
PCB 14	ND	U	87.7	87.7	-		1
PCB 11	ND	U	90.4	90.4	-		1
PCBs 12 + 13	ND	U	86.8	86.8	-		1
PCB 15	ND	U	62.5	62.5	-		1
PCB 19	ND	U	23.6	23.6			1
PCB 18	ND	U	16.7	39.7			1
PCB 30	ND	U	22.7	39.7			1
PCB 17	ND	U	23.3	23.3			1
PCB 27	ND	U	17.5	17.5			1
PCB 24	ND	U	15.7	15.9			1
PCB 16	ND	U	26.8	26.8			1
PCB 32	ND	U	15.7	15.9			1
PCB 34	ND	U	15.3	15.9			1
PCB 23	ND	U	13.2	15.9			1
PCBs 26 + 29	ND	U	14.1	39.7			1
PCB 25	ND	U	10.6	15.9			1
PCB 31	ND	U	13.0	39.7			1
PCBs 20 + 28	ND	U	24.8	39.7			1
PCBs 21 + 33	ND	U	20.3	39.7			1
PCB 22	ND	U	13.9	15.9			1
PCB 36	ND	U	13.8	15.9			1
PCB 39	ND	U	13.0	15.9			1
PCB 38	ND	U	15.3	15.9			1
PCB 35	ND	U	14.9	15.9			1
PCB 37	ND	U	17.2	17.2			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	ND	U	16.5	16.5			1
PCBs 50 + 53	ND	U	19.1	79.3			1
PCBs 45 + 51	ND	U	19.6	39.7			1
PCB 46	ND	U	23.7	23.7			1
PCB 52	42.2		20.9	39.7	0.66	1.001	1
PCBs 43 + 73	ND	U	17.0	39.7			1
PCB 69	ND	U	11.8	79.3			1
PCB 49	ND	U	18.7	79.3			1
PCB 48	ND	U	18.8	39.7			1
PCBs 44 + 47 + 65	53.9**J**		16.4	79.3	0.70	1.040	1
PCBs 59 + 62 + 75	ND	U	14.5	79.3			1
PCB 42	ND	U	17.1	79.3			1
PCB 41	ND	U	24.4	79.3			1
PCBs 40 + 71	ND	U	17.9	79.3			1
PCB 64	ND	U	11.0	39.7			1
PCB 72	ND	U	14.6	39.7			1
PCB 68	ND	U	13.6	39.7			1
PCB 57	ND	U	16.0	39.7			1
PCB 58	ND	U	15.3	39.7			1
PCB 67	ND	U	14.0	39.7			1
PCB 63	ND	U	15.9	39.7			1
PCB 61	ND	U	16.6	159			1
PCBs 70 + 74 + 76	ND	U	13.4	159			1
PCB 66	ND	U	19.9	39.7			1
PCB 55	ND	U	21.7	39.7			1
PCB 56	ND	U	11.5	39.7			1
PCB 60	ND	U	11.1	39.7			1
PCB 80	ND	U	9.77	39.7			1
PCB 79	ND	U	10.5	39.7			1
PCB 78	ND	U	11.9	39.7			1
PCB 81	ND	U	14.2	15.9			1
PCB 77	ND	U	9.89	15.9			1
PCB 104	ND	U	20.6	20.6			1
PCB 96	ND	U	15.3	39.7			1
PCB 103	ND	U	18.6	39.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	ND	U	20.2	39.7			1
PCBs 95 + 100	ND	U	18.4	159			1
PCB 93	ND	U	21.8	159			1
PCBs 98 + 102	ND	U	17.3	159			1
PCB 88	ND	U	21.6	39.7			1
PCB 91	ND	U	18.6	39.7			1
PCB 84	ND	U	23.5	23.5			1
PCB 89	ND	U	16.4	39.7			1
PCB 121	ND	U	10.3	39.7			1
PCB 92	ND	U	15.4	39.7			1
PCBs 90 + 101 + 113	ND	U	13.2	159			1
PCBs 83 + 99	ND	U	14.8	79.3			1
PCB 112	ND	U	11.1	39.7			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	ND	U	12.5	159			1
PCBs 117 + 116	ND	U	11.0	79.3			1
PCB 85	ND	U	16.2	79.3			1
PCBs 110 + 115	ND	U	9.39	79.3			1
PCB 82	ND	U	19.3	39.7			1
PCB 111	ND	U	10.6	39.7			1
PCB 120	ND	U	10.5	39.7			1
PCBs 108 + 124	ND	U	14.0	79.3			1
PCB 107	ND	U	15.5	39.7			1
PCB 123	ND	U	13.9	15.9			1
PCB 106	ND	U	14.9	39.7			1
PCB 118	ND	U	13.8	15.9			1
PCB 122	ND	U	16.6	39.7			1
PCB 114	ND	U	14.5	15.9			1
PCB 105	ND	U	14.8	15.9			1
PCB 127	ND	U	15.0	39.7			1
PCB 126	ND	U	15.2	15.9			1
PCB 155	ND	U	15.1	15.9			1
PCB 152	ND	U	13.7	39.7			1
PCB 150	ND	U	11.3	39.7			1
PCB 136	ND	U	13.3	39.7			1
PCB 145	ND	U	12.4	39.7			1
PCB 148	ND	U	17.3	39.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 151	ND	U	19.1	79.3			1
PCBs 135 + 154	ND	U	15.0	79.3			1
PCB 144	ND	U	16.4	39.7			1
PCBs 147 + 149	ND	U	19.2	79.3			1
PCB 134	ND	U	19.2	79.3			1
PCB 143	ND	U	21.7	79.3			1
PCBs 139 + 140	ND	U	19.4	79.3			1
PCB 131	ND	U	19.0	39.7			1
PCB 142	ND	U	22.7	39.7			1
PCB 132	ND	U	22.4	39.7			1
PCB 133	ND	U	22.6	39.7			1
PCB 165	ND	U	16.2	39.7			1
PCB 146	ND	U	20.3	39.7			1
PCB 161	ND	U	15.7	39.7			1
PCBs 153 + 168	ND	U	16.3	79.3			1
PCB 141	ND	U	21.0	39.7			1
PCB 130	ND	U	25.8	39.7			1
PCB 137	ND	U	19.6	39.7			1
PCB 164	ND	U	16.2	39.7			1
PCBs 129 + 138 + 163	ND	U	23.6	159			1
PCB 160	ND	U	9.13	159			1
PCB 158	ND	U	14.6	39.7			1
PCB 166	ND	U	16.3	79.3			1
PCB 128	ND	U	20.3	79.3			1
PCB 159	ND	U	19.2	39.7			1
PCB 162	ND	U	17.4	39.7			1
PCB 167	ND	U	15.9	15.9			1
PCBs 156 + 157	ND	U	28.2	31.7			1
PCB 169	ND	U	16.8	16.8			1
PCB 188	ND	U	19.4	19.4			1
PCB 179	ND	U	15.8	39.7			1
PCB 184	ND	U	13.8	39.7			1
PCB 176	ND	U	16.1	39.7			1
PCB 186	ND	U	15.2	39.7			1
PCB 178	ND	U	21.2	39.7			1
PCB 175	ND	U	21.2	39.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	ND	U	18.9	39.7			1
PCB 182	ND	U	21.1	39.7			1
PCB 183	ND	U	33.7	79.3			1
PCB 185	ND	U	31.3	79.3			1
PCB 174	ND	U	34.1	39.7			1
PCB 177	ND	U	37.2	39.7			1
PCB 181	ND	U	31.0	39.7			1
PCBs 171 + 173	ND	U	37.6	79.3			1
PCB 172	ND	U	39.0	39.7			1
PCB 192	ND	U	27.2	39.7			1
PCBs 180 + 193	ND	U	26.0	79.3			1
PCB 191	ND	U	28.3	39.7			1
PCB 170	ND	U	38.9	39.7			1
PCB 190	ND	U	26.5	39.7			1
PCB 189	ND	U	20.7	20.7			1
PCB 202	ND	U	16.1	16.1			1
PCB 201	ND	U	15.5	39.7			1
PCB 204	ND	U	15.6	39.7			1
PCB 197	ND	U	14.3	79.3			1
PCB 200	ND	U	15.8	79.3			1
PCBs 198 + 199	ND	U	20.9	79.3			1
PCB 196	ND	U	22.0	39.7			1
PCB 203	ND	U	18.1	39.7			1
PCB 195	ND	U	23.2	39.7			1
PCB 194	ND	U	22.1	39.7			1
PCB 205	ND	U	16.4	16.4			1
PCB 208	ND	U	26.5	26.5			1
PCB 207	ND	U	26.2	39.7			1
PCB 206	ND	U	24.9	24.9			1
PCB 209	ND	U	15.7	15.9			1
Total MonoCB	ND	U	31.2	39.7			1
Total DiCB	ND	U	62.5	79.3			1
Total TriCB	ND	U	10.6	39.7			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total TetraCB	96.1**J**		9.77	159			1
Total PentaCB	ND	U	9.39	159			1
Total HexaCB	ND	U	9.13	159			1
Total HeptaCB	ND	U	13.8	79.3			1
Total OctaCB	ND	U	14.3	79.3			1
Total NonaCB	ND	U	24.9	39.7			1
Total PCBs	96.1**J**		9.13	159			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	Percent
Lab Code:	EQ1500059-01	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/30/15 18:08
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.261g	**Instrument Name:**	E-HRMS-01
		GC Column:	SPB-OCTYL
Data File Name:	U152211	**Blank File Name:**	U152211
ICAL Date:	10/08/14	**Cal Ver. File Name:**	U152210

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	447.333	22		5-145	3.23	0.742
PCB 3L	2000	511.061	26		5-145	3.60	0.868
PCB 4L	2000	388.006	19		5-145	1.76	0.884
PCB 15L	2000	660.161	33		5-145	1.64	1.226
PCB 19L	2000	458.625	23		5-145	1.19	1.065
PCB 37L	2000	817.722	41		5-145	0.90	1.090
PCB 54L	2000	521.851	26		5-145	0.83	0.824
PCB 81L	2000	620.318	31		10-145	0.86	1.361
PCB 77L	2000	801.777	40		10-145	0.89	1.388
PCB 104L	2000	548.974	27		10-145	1.77	0.814
PCB 123L	2000	805.094	40		10-145	1.65	1.149
PCB 118L	2000	730.854	37		10-145	1.62	1.159
PCB 114L	2000	741.917	37		10-145	1.51	1.175
PCB 105L	2000	761.515	38		10-145	1.52	1.199
PCB 126L	2000	740.461	37		10-145	1.62	1.298
PCB 155L	2000	603.261	30		10-145	1.24	0.785
PCB 167L	2000	703.183	35		10-145	1.19	1.075
PCBs 156L + 157L	4000	1427.112	36		10-145	1.20	1.107
PCB 169L	2000	749.731	37		10-145	1.24	1.189
PCB 188L	2000	503.618	25		10-145	1.10	0.714
PCB 189L	2000	737.778	37		10-145	1.03	0.960
PCB 202L	2000	581.629	29		10-145	0.85	0.818
PCB 205L	2000	781.314	39		10-145	0.87	1.009
PCB 208L	2000	592.176	30		10-145	0.84	0.947
PCB 206L	2000	774.796	39		10-145	0.77	1.042
PCB 209L	2000	1045.046	52		10-145	1.28	1.071
PCB 28L	4000	2443.808	61		5-145	1.04	0.928
PCB 111L	4000	1848.143	46		10-145	1.60	1.086
PCB 178L	4000	1619.648	40		10-145	1.10	1.009

Accuracy & Precision

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dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Analyzed:**	01/31/15
Sample Matrix:	Sediment	**Date Extracted:**	01/22/15

Duplicate Lab Control Sample Summary
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Units:**	ng/Kg
Prep Method:	Method Soxhlet	**Basis:**	Dry
		Analysis Lot:	431671

	Lab Control Sample EQ1500059-02			Duplicate Lab Control Sample EQ1500059-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
PCB 1	985	920	107	772	692	112	60-135	24	50
PCB 3	1010	920	110	717	692	104	60-135	34	50
PCB 15	1060	920	115	839	692	121	60-135	23	50
PCB 4	836	920	91	652	692	94	60-135	25	50
PCB 19	911	920	99	665	692	96	60-135	31	50
PCB 37	1070	920	117	752	692	109	60-135	35	50
PCB 54	894	920	97	667	692	96	60-135	29	50
PCB 77	902	920	98	639	692	92	60-135	34	50
PCB 81	833	920	91	682	692	98	60-135	20	50
PCB 104	888	920	97	632	692	91	60-135	34	50
PCB 105	881	920	96	725	692	105	60-135	19	50
PCB 114	959	920	104	699	692	101	60-135	31	50
PCB 118	987	920	107	773	692	112	60-135	24	50
PCB 123	875	920	95	691	692	100	60-135	24	50
PCB 126	854	920	93	665	692	96	60-135	25	50
PCB 155	887	920	96	652	692	94	60-135	30	50
PCB 167	984	920	107	723	692	104	60-135	31	50
PCB 169	909	920	99	646	692	93	60-135	34	50
PCBs 156 + 157	1830	1840	99	1520	1380	109	60-135	19	50
PCB 188	961	920	104	738	692	107	60-135	26	50
PCB 189	951	920	103	697	692	101	60-135	31	50
PCB 202	884	920	96	696	692	101	60-135	24	50
PCB 205	1030	920	112	790	692	114	60-135	27	50
PCB 206	1010	920	110	750	692	108	60-135	30	50
PCB 208	893	920	97	666	692	96	60-135	29	50
PCB 209	1020	920	110	703	692	102	60-135	36	50

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500059-02	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 18:52
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.087g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238940	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	985		336	336	3.28	0.995	1
PCB 3	1010		12.9	18.4	3.22	1.001	1
PCB 4	836		4.44	18.4	-	1.001	1
PCB 15	1060		5.04	18.4	-	1.001	1
PCB 19	911		19.6	19.6	1.09	1.001	1
PCB 37	1070		26.7	26.7	1.01	1.001	1
PCB 54	894		8.64	18.4	0.79	1.002	1
PCB 81	833		15.1	18.4	0.83	1.001	1
PCB 77	902		11.6	18.4	0.76	1.001	1
PCB 104	888		9.40	18.4	1.55	1.001	1
PCB 123	875		29.3	29.3	1.43	1.001	1
PCB 118	987		24.2	24.2	1.59	1.001	1
PCB 114	959		13.3	18.4	1.59	1.000	1
PCB 105	881		18.6	18.6	1.49	1.000	1
PCB 126	854		14.1	18.4	1.54	1.001	1
PCB 155	887		6.89	18.4	1.39	1.001	1
PCB 167	984		8.56	18.4	1.21	1.001	1
PCBs 156 + 157	1830		17.0	36.8	1.35	1.000	1
PCB 169	909		9.65	18.4	1.17	1.001	1
PCB 188	961		14.8	18.4	1.01	1.001	1
PCB 189	951		10.5	18.4	1.08	1.001	1
PCB 202	884		10.1	18.4	0.86	1.001	1
PCB 205	1030		11.0	18.4	0.90	1.000	1
PCB 208	893		10.2	18.4	0.87	1.001	1
PCB 206	1010		15.1	18.4	0.85	1.001	1
PCB 209	1020		11.8	18.4	1.20	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500059-02	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 18:52
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.087g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238940	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	1990		12.9	46.0			1
Total DiCB	1890		4.44	92.0			1
Total TriCB	1990		19.6	46.0			1
Total TetraCB	2630		8.64	184			1
Total PentaCB	5440		9.40	184			1
Total HexaCB	4610		6.89	184			1
Total HeptaCB	1910		10.5	92.0			1
Total OctaCB	1920		10.1	92.0			1
Total NonaCB	1900		10.2	46.0			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500059-02	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 18:52
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.087g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238940	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	115.783	6		5-145	2.75	0.729
PCB 3L	2000	509.670	25		5-145	2.89	0.892
PCB 4L	2000	611.360	31		5-145	1.59	0.902
PCB 15L	2000	766.002	38		5-145	1.59	1.196
PCB 19L	2000	729.011	36		5-145	1.00	1.055
PCB 37L	2000	697.336	35		5-145	1.04	1.088
PCB 54L	2000	819.360	41		5-145	0.84	0.837
PCB 81L	2000	406.222	20		10-145	0.76	1.347
PCB 77L	2000	640.156	32		10-145	0.85	1.375
PCB 104L	2000	829.000	41		10-145	1.40	0.822
PCB 123L	2000	381.283	19		10-145	1.61	1.149
PCB 118L	2000	570.042	29		10-145	1.63	1.161
PCB 114L	2000	726.743	36		10-145	1.61	1.178
PCB 105L	2000	685.954	34		10-145	1.61	1.201
PCB 126L	2000	709.309	35		10-145	1.56	1.295
PCB 155L	2000	3493.984	175	**Y**	10-145	1.17	0.783
PCB 167L	2000	3168.808	158	**Y**	10-145	1.27	1.068
PCBs 156L + 157L	4000	6737.944	168	**Y**	10-145	1.25	1.100
PCB 169L	2000	3554.598	178	**Y**	10-145	1.32	1.177
PCB 188L	2000	655.990	33		10-145	1.10	0.722
PCB 189L	2000	868.531	43		10-145	1.05	0.960
PCB 202L	2000	725.521	36		10-145	0.86	0.824
PCB 205L	2000	769.846	38		10-145	0.90	1.009
PCB 208L	2000	885.724	44		10-145	0.77	0.947
PCB 206L	2000	932.949	47		10-145	0.83	1.042
PCB 209L	2000	779.858	39		10-145	1.22	1.071
PCB 28L	4000	2174.964	54		5-145	1.04	0.931
PCB 111L	4000	1919.185	48		10-145	1.60	1.084
PCB 178L	4000	7631.373	191	**Y**	10-145	1.05	1.008

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500059-03	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 19:57
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.445g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238941	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	772		63.9	63.9	2.79	1.000	1
PCB 3	717		12.9	13.8	3.32	1.000	1
PCB 4	652		7.08	13.8	-	1.001	1
PCB 15	839		5.38	13.8	-	1.001	1
PCB 19	665		20.2	20.2	1.10	1.001	1
PCB 37	752		21.7	21.7	1.17	1.001	1
PCB 54	667		8.26	13.8	0.72	1.001	1
PCB 81	682		19.1	19.1	0.87	1.000	1
PCB 77	639		10.7	13.8	0.75	1.001	1
PCB 104	632		9.01	13.8	1.62	1.001	1
PCB 123	691		12.8	13.8	1.47	1.001	1
PCB 118	773		8.63	13.8	1.56	1.000	1
PCB 114	699		8.69	13.8	1.71	1.001	1
PCB 105	725		9.35	13.8	1.57	1.001	1
PCB 126	665		9.48	13.8	1.69	1.001	1
PCB 155	652		7.05	13.8	1.28	1.001	1
PCB 167	723		11.1	13.8	1.12	1.000	1
PCBs 156 + 157	1520		22.4	27.7	1.15	1.000	1
PCB 169	646		13.1	13.8	1.24	1.000	1
PCB 188	738		8.08	13.8	1.04	1.000	1
PCB 189	697		12.6	13.8	0.96	1.000	1
PCB 202	696		10.9	13.8	0.88	1.000	1
PCB 205	790		12.3	13.8	0.91	1.000	1
PCB 208	666		9.90	13.8	0.77	1.000	1
PCB 206	750		14.0	14.0	0.79	1.001	1
PCB 209	703		10.8	13.8	1.13	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500059-03	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 19:57
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.445g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238941	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	1490		12.9	34.6			1
Total DiCB	1490		5.38	69.2			1
Total TriCB	1420		20.2	34.6			1
Total TetraCB	1990		8.26	138			1
Total PentaCB	4180		8.63	138			1
Total HexaCB	3540		7.05	138			1
Total HeptaCB	1440		8.08	69.2			1
Total OctaCB	1490		10.9	69.2			1
Total NonaCB	1420		9.90	34.6			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500059-03	**Basis:**	Dry

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	01/31/15 19:57
Prep Method:	Method Soxhlet	**Date Extracted:**	1/22/15
Sample Amount:	1.445g	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U238941	**Blank File Name:**	U152211
ICAL Date:	02/11/14	**Cal Ver. File Name:**	U238932

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	451.510	23		5-145	2.99	0.751
PCB 3L	2000	473.828	24		5-145	3.16	0.875
PCB 4L	2000	504.481	25		5-145	1.57	0.888
PCB 15L	2000	633.742	32		5-145	1.55	1.218
PCB 19L	2000	637.613	32		5-145	1.04	1.063
PCB 37L	2000	628.773	31		5-145	1.12	1.090
PCB 54L	2000	732.407	37		5-145	0.85	0.832
PCB 81L	2000	362.883	18		10-145	0.79	1.348
PCB 77L	2000	718.483	36		10-145	0.80	1.376
PCB 104L	2000	776.189	39		10-145	1.58	0.821
PCB 123L	2000	551.190	28		10-145	1.62	1.144
PCB 118L	2000	705.050	35		10-145	1.58	1.155
PCB 114L	2000	724.897	36		10-145	1.68	1.172
PCB 105L	2000	722.682	36		10-145	1.70	1.195
PCB 126L	2000	728.892	36		10-145	1.47	1.290
PCB 155L	2000	1081.558	54		10-145	1.16	0.788
PCB 167L	2000	1035.559	52		10-145	1.35	1.071
PCBs 156L + 157L	4000	2105.881	53		10-145	1.23	1.105
PCB 169L	2000	1131.184	57		10-145	1.33	1.183
PCB 188L	2000	641.116	32		10-145	1.09	0.719
PCB 189L	2000	781.476	39		10-145	1.06	0.960
PCB 202L	2000	712.669	36		10-145	0.96	0.822
PCB 205L	2000	732.086	37		10-145	0.96	1.009
PCB 208L	2000	861.889	43		10-145	0.82	0.947
PCB 206L	2000	876.208	44		10-145	0.78	1.042
PCB 209L	2000	830.511	42		10-145	1.18	1.071
PCB 28L	4000	2119.318	53		5-145	1.05	0.930
PCB 111L	4000	1823.209	46		10-145	1.56	1.083
PCB 178L	4000	2697.016	67		10-145	0.99	1.008

Black Carbon

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

November 13, 2014

Client: Science and Engineering for the Environment
4401 Latona Ave NE
Seattle, WA 98105
Attn: Shannon Olson
tim Thompson
Project: RM 11E
ALS Project K1411753

Date Received: October 22, 2014

Case Narrative

Sample Receipt

Seven sediment samples in 8 oz glass jars with Teflon lined lids were received in good condition. See attached COC documents.

The samples were analyzed for the following analytes.

Total Moisture	ASTM D2216, Gravimetric at 105˚C
Black Carbon in Sediment	Gustafsson, GBC Cyc 54 881-890 12, CTO Pretreatment / Combustion / IR Detection EPA 440.0, Combustion / IR / TCD

Sample Preparation

The sediment samples were prepared for analysis using the following procedures.

1. The entire sample from the jar was transferred to a pre-weighted plastic amd weighed.
2. The sample was air dried at 40˚C for several days in an air drying oven.
3. The pan and air dried sample were weighed back and the Air Dry Loss moisture calculated.
4. The entire air dried sample was ground to < 60 mesh using a Tungsten Carbide mini ball mill.

Black Carbon Analyses

Approximately 50 mg of sample along with Laboratory Control samples were weighed into silver foil capsules, treated with several drops of 1 N HCl and dried at 65˚C for one hour (this step was performed twice to insure complete removal of carbonates in the sample), Several blank capsules were included in the process to serve as preparation blanks. The HCl treated capsules were then placed in a furnace and heated to 375˚C for 18 hours with a continuous flow of air.

November 13, 2014

Client: Science and Engineering for the Environment
4401 Latona Ave NE
Seattle, WA 98105
Attn: Shannon Olson
tim Thompson
Project: RM 11E
ALS Project K1411753

Date Received: October 22, 2014

Case Narrative

After pre-treatment, the samples and capsules were analyzed using an LECO Macro TruSpec CHN analyzer. The samples were combusted in the analyzer at 950˚C. Note that the actual combustion temperature is closer to 1200˚C because of the catalyst effect of the silver foil. The resulting CO2 was measured by IR and reported as Black Carbon on a moisture free basis in weight %.

The LECO CHN analyzer was calibrated using NIST traceable Organic Analytical Standards (OAS). The calibration was verified with OAS standards and other NIST traceable Standard Reference Material initially and after every 10 or fewer samples. See the raw data for the calibration and other QC sample results.

Quality Control and Analytical Issues

The Laboratory Control Samples for the Black Carbon analyses consist of one or both of the following NIST Standard Reference Materials.

1	NIST 1650b - Diesel Particulate Matter, CN2315	Theoretical Value	44.22	wt%
2	NIST 1944 - NY/NJ Waterway Sediment , CN2313	Theoretical Value	1.086	wt%

The Theoretical Values are based on historical data of analyses performed by ALS Tucson over several years.
See attached historical data summary in the raw data.

No analytical or QC issues occurred during the analyses .

Ralph V. Poulsen, Lab Director

November 13, 2014

Client: Science and Engineering for the Environment
4401 Latona Ave NE
Seattle, WA 98105
Attn: Shannon Olson
tim Thompson
Project: RM 11E
ALS Project K1411753

Date Received: October 22, 2014

Chain of Custody Documents

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM 11E
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Black Carbon GBC Cyc 54 881-890 12 01
K1411753-001	RM11E-PW001-SED	1	Sediment	10/20/14	1135	10/22/14	TUCSON	IV
K1411753-002	RM11E-PW002-SED	1	Sediment	10/20/14	1018	10/22/14	TUCSON	IV
K1411753-003	RM11E-PW003-SED	1	Sediment	10/20/14	0000	10/22/14	TUCSON	IV
K1411753-004	RM11E-PW004-SED	1	Sediment	10/20/14	1305	10/22/14	TUCSON	IV
K1411753-005	RM11E-PW005-SED	1	Sediment	10/20/14	1508	10/22/14	TUCSON	IV
K1411753-006	RM11E-PW504-SED	1	Sediment	10/20/14	1012	10/22/14	TUCSON	IV
K1411753-007	RM11E-PW006-SED	1	Sediment	10/20/14	0000	10/22/14	TUCSON	IV

Special Instructions/Comments

Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

Note: Critical Due Date.

pH Checked _____

Turnaround Requirements

____ **RUSH** (Surcharges Apply)

PLEASE CIRCLE WORK DAYS

1 2 3 4 5

____ **STANDARD**

Requested FAX Date: _____

Requested Report Date: 11/13/14

Report Requirements

____ I. Results Only

____ II. Results + QC Summaries

____ III. Results + QC and Calibration Summaries

X IV. Data Validation Report with Raw Data

PQL/MDL/J Y

EDD Y

Invoice Information

PO# K1411753

Bill to

Relinquished By: [signature] 10/22/14 1300

Received By: [signature] 10/23/14 0923

Airbill Number: _____

Page 1

K1411753

____ **Ship To: TUCSON**
ALS Environmental
3860 S. Palo Verde Rd.
Suite 302
Tucson, AZ 85714

PC ____ Date 10/22/14
SMO ____ Date 10/22/14

Instructions:
Ice X
Dry Ice ____
No Ice ____

Shipping:
Overnight X
2nd Day ____
Ground ____

Bill to Client Account ____

Comments:

ALS Environmental

ADDRESS 3860 S. Palo Verde Road, Suite 302, Tucson, AZ 85714
PHONE +1 520 573 1061 FAX +1 520 573 1063

K1411753 5
Science and Engineering for the Environment, LLC
RM 11E

Sample Receipt Form

Client / Project: ALS KELSO

Work Order .

Received by: ARAY

Date: 10/23/14 0923

Matrix: SOLID

Samples were received via? Mail (FedEx) UPS DHL Courier Hand Other_____

Samples were received in: (circle) (Cooler) Box Envelope Other _____

Were custody seals on containers? 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

Cooler Temp C	Temp Blank C	Tracking Number
1.8C°	0.8C°	5478 9738 6868

Important note- temperatures out of range of IR Temperature Gun, use alternative thermometer available in the lab.

Packing material used? Bags (Bubble Wrap) Dry Ice (Gel Packs) Wet Ice Paper Other _____

Did all bottles arrive in good condition (unbroken)? NA (Y) N *If No, record comments below*

Did all sample labels and tags agree with COC? NA (Y) N *If No, record discrepancies below*

Were all the appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N

Are samples received deemed acceptable? (Y) N

Comments: (7) 250 mL widemouth
IN FRIDGE A

Notes, discrepancies, & resolutions:
IV DATA VALIDATION REPORT WITH RAW DATA
NOTE: CRITICAL DUE DATE 11/13/14

As a part of ISO 17025 protocols, ALS must notify clients that the quoted analytical methods performed by ALS may have minor modifications from the methods as published. These modifications are written into our Standard Operating Procedures and do not impact the quality of the data. Receipt of this document will be considered an acceptance of the procedures used by the laboratory for analysis unless notified by the client.
Modifications may include, but are not limited to:

- The analysis of a sample matrix that differs from that stated in the published method (example - ASTM D5865 Standard Test Method for Gross Calorific Value of Coal and Coke is used for other matrices such as biomass, Tire Derived Fuel, etc.).
- Analyzing a sample mass that differs from those in the published method (example - to accommodate samples with high concentrations of analyte, samples of limited volume, or to comply with the instrument manufacturer's operating guidelines).
- Instruments used for the analysis may differ from those listed in the published method (example - using ICP-OES when the method references flame Atomic Absorption Spectroscopy).

November 13, 2014

Client: Science and Engineering for the Environment
4401 Latona Ave NE
Seattle, WA 98105

Attn: Shannon Olson
tim Thompson

Project: RM 11E
ALS Project K1411753

Date Received: October 22, 2014

Analytical Reports and QC Data

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 11:35
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW001-SED	**Basis:**	Dry
Lab Code:	K1411753-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.18 U	Percent (Solid)	0.53	0.18	1	11/06/14 15:12	

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:18
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW002-SED	**Basis:**	Dry
Lab Code:	K1411753-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	**0.17**	Percent (Solid)	0.51	0.17	1	11/06/14 15:18	**J**

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW003-SED	**Basis:**	Dry
Lab Code:	K1411753-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	**4.66**	Percent (Solid)	0.51	0.17	1	11/06/14 15:23	

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 13:05
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW004-SED	**Basis:**	Dry
Lab Code:	K1411753-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.16 U	Percent (Solid)	0.49	0.16	1	11/06/14 15:29	

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 15:08
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW005-SED	**Basis:**	Dry
Lab Code:	K1411753-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.18 U	Percent (Solid)	0.53	0.18	1	11/06/14 15:34	

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 10:12
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW504-SED	**Basis:**	Dry
Lab Code:	K1411753-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.17 U	Percent (Solid)	0.5	0.17	1	11/06/14 15:40	

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/14 00:00
Sample Matrix:	Sediment	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PW006-SED	**Basis:**	Dry
Lab Code:	K1411753-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.18 U	Percent (Solid)	0.54	0.18	1	11/06/14 15:45	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project	RM 11E	**Date Collected:**	10/20/14
Sample Matrix:	Sediment	**Date Received:**	10/22/14
		Date Analyzed:	11/06/14

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	RM11E-PW006-SED	**Units:**	Percent (Solid)
Lab Code:	K1411753-007	**Basis:**	Dry

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1411753-007DUP Result	Average	RPD	RPD Limit
Carbon	GBC Cyc 54 881-890 12 01	0.52	0.18	0.18 U	0.18	NC	NC	20

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.

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Analyzed:**	11/06/14
Sample Matrix:	Sediment	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon

Analysis Method:	GBC Cyc 54 881-890 12 01	**Units:**	Percent (Solid)
Prep Method:	None	**Basis:**	Dry
		Analysis Lot:	420090

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1411753-LCS1	47.56	44.22	107.6	80-120

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Analyzed:**	11/06/14
Sample Matrix:	Sediment	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon

Analysis Method:	GBC Cyc 54 881-890 12 01	**Units:**	Percent (Solid)
Prep Method:	None	**Basis:**	Dry
		Analysis Lot:	420090

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1411753-LCS2	1.25	1.086	115.1	80-120

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Analyzed:**	11/06/14
Sample Matrix:	Sediment	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon

Analysis Method:	GBC Cyc 54 881-890 12 01	**Units:**	Percent (Solid)
Prep Method:	None	**Basis:**	Dry
		Analysis Lot:	420090

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1411753-LCS3	1.08	1.086	99.4	80-120

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	Dry
Lab Code:	K1411753-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.2 U	Percent (Solid)	0.6	0.2	1	11/06/14 14:45	

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	Dry
Lab Code:	K1411753-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Carbon	GBC Cyc 54 881-890 12 01	0.2 U	Percent (Solid)	0.6	0.2	1	11/06/14 14:50	

November 13, 2014

Client: Science and Engineering for the Environment
4401 Latona Ave NE
Seattle, WA 98105
Attn: Shannon Olson
tim Thompson
Project: RM 11E
ALS Project K1411753

Date Received: October 22, 2014

Raw Data

ALS Environmental
ALS Group USA, Corp.
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www.alsglobal.com

March 10, 2015

Analytical Report for Service Request No: K1411753
Revised Service Request No: K1411753.03

Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 98105

RE: RM 11E

Dear Tim:

Enclosed is the revised report for the samples submitted to our laboratory on October 22, 2014. For your reference, these analyses have been assigned our service request number K1411753.

At the request of the client the samples in this service request were analyzed for PCB Aroclors.

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.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) 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.

We apologize for any inconvenience this may have created.

Please call if you have any questions. My extension is 3316. You may also contact me via Email at Jeff.Christian@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Jeff Christian
Director of Operations - Western U.S.A.

JC/gs

REVISED
10:16 am, Mar 11, 2015

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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 as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
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 analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
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 or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

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 as defined by the DOD or NELAC standards.
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 estimated value.
J	The result is an estimated value.
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.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

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.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment	**Service Request No.:**	K1411753
Project:	RM11E	**Date Received:**	10/22/2015
Sample Matrix:	Sediment		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seven sediment samples were received for analysis at ALS Environmental on 10/22/2015. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

PCB Congeners by EPA Method 8082

General Notes:
The samples were originally analyzed and reported on November 20, 2015. Based on anomalies associated with the PCB Aroclor results as compared to the PCB Congener results, the samples were requested for re-analysis of PCB Aroclors. This report contains the results for PCB Aroclors only.

Second Source Exceptions:
The analysis of PCB Aroclors by EPA 8082A requires the use of dual column confirmation. The Initial Calibration Verification (ICV) evaluation criteria were not met on the confirmation column for Aroclor 1260 in CAL13624. The ICV criteria were met on the alternate column. The data quality was not affected. No further corrective action was necessary.

Calibration Verification Exceptions:
The analysis of PCB Aroclors by EPA 8082A requires the use of dual column confirmation. When the Continuing Calibration Verification (CCV) criterion is met for both columns, the lower of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for Aroclor 1016 in CCVs 0305F005 and 0305F012. The results for the associated target Aroclors were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.

Matrix Spike Recovery Exceptions:
The control criteria for the matrix spike/duplicate matrix spike recoveries of Aroclor 1016 for sample RM11E-PW001-SED were not applicable. The chromatogram indicated non-target matrix background components contributed to the reported matrix spike concentrations. Thus, the reported recoveries contained a high bias. The magnitude of the contribution was not particularly high, but did contribute to the reported spike values.

The duplicate matrix spike recovery of Aroclor 1260 for sample RM11E-PW001-SED was outside control criteria. The variability in the results was attributed to the heterogeneous character of the sample. From a physical standpoint, the sample contained relatively large amounts of rocks, which complicated the homogenization process. However, of more significance was the elevated concentration of Aroclor 1260 in the duplicate matrix spike sample. Thus, the sample also appeared to contain a heterogeneous distribution of PCBs possibly associated with high concentration particulates acting as sinks. Standard mixing techniques were used, but were not sufficient for complete

homogenization of this sample. Recovery in the associated Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. No further corrective action was appropriate.

Elevated Detection Limits:
Samples RM11E-PW004-SED and RM11E-PW504-SED required dilution due to the presence of elevated levels of target analyte. The reporting limits were adjusted to reflect the dilution.

The detection limit was elevated for multiple target Aroclors in several 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.

Polychlorinated Biphenyls (PCBs)

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753

Cover Page - Organic Analysis Data Package
Polychlorinated Biphenyls (PCBs)

Sample Name	Lab Code	Date Collected	Date Received
RM11E-PW001-SED	K1411753-001	10/20/2014	10/22/2014
RM11E-PW002-SED	K1411753-002	10/20/2014	10/22/2014
RM11E-PW003-SED	K1411753-003	10/20/2014	10/22/2014
RM11E-PW004-SED	K1411753-004	10/20/2014	10/22/2014
RM11E-PW005-SED	K1411753-005	10/20/2014	10/22/2014
RM11E-PW504-SED	K1411753-006	10/20/2014	10/22/2014
RM11E-PW006-SED	K1411753-007	10/20/2014	10/22/2014
RM11E-PW006-SEDMS	KWG1501502-1	10/20/2014	10/22/2014
RM11E-PW006-SEDDMS	KWG1501502-2	10/20/2014	10/22/2014
RM11E-PW001-SEDMS	KWG1501737-1	10/20/2014	10/22/2014
RM11E-PW001-SEDDMS	KWG1501737-2	10/20/2014	10/22/2014

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW001-SED	**Units:**	ug/Kg
Lab Code:	K1411753-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	7.4	7.4	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1221	ND	U	14	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1232	ND	Ui	9.8	9.8	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1242	ND	Ui	6.6	5.4	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1248	ND	Ui	6.9	6.9	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1254	ND	Ui	6.6	6.6	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1260	**82**		6.6	2.1	1	03/03/15	03/05/15	KWG1501737	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	75	43-148	03/05/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW002-SED	**Units:**	ug/Kg
Lab Code:	K1411753-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	22	22	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	Ui	17	7.2	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	Ui	130	130	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	Ui	60	60	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	Ui	62	62	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	Ui	27	27	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	**170**		8.2	2.1	1	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	80	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW003-SED	**Units:**	ug/Kg
Lab Code:	K1411753-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	25	25	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	Ui	17	12	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	Ui	87	87	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	Ui	62	62	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	Ui	37	37	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	Ui	48	48	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	**120**		8.3	2.1	1	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	77	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW004-SED	**Units:**	ug/Kg
Lab Code:	K1411753-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	71	49	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	U	150	21	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	Ui	480	480	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	Ui	120	120	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	Ui	380	380	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	Ui	120	120	10	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	**1600**	D	71	21	10	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	114	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW005-SED	**Units:**	ug/Kg
Lab Code:	K1411753-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	17	17	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	Ui	15	6.5	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	Ui	20	20	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	Ui	23	23	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	Ui	14	14	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	Ui	28	28	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	**55**		7.1	2.1	1	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	79	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW504-SED	**Units:**	ug/Kg
Lab Code:	K1411753-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	38	38	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	Ui	64	15	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	Ui	55	55	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	Ui	97	97	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	Ui	280	280	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	Ui	44	44	5	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	**920**	D	32	11	5	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	81	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW006-SED	**Units:**	ug/Kg
Lab Code:	K1411753-007	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	U	15	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	ND	U	7.5	2.1	1	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	84	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG1501502-4	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1221	ND	U	10	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1232	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1242	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1248	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1254	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	
Aroclor 1260	ND	U	5.0	2.1	1	02/24/15	02/27/15	KWG1501502	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	43-148	02/27/15	Acceptable

Comments:

Analytical Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG1501737-4	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1221	ND	U	10	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1232	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1242	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1248	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1254	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	
Aroclor 1260	ND	U	5.0	2.1	1	03/03/15	03/05/15	KWG1501737	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	69	43-148	03/05/15	Acceptable

Comments:

QA/QC Report

Client: Science and Engineering for the Environm
Service Request: K1411753
Project: RM 11E
Sample Matrix: Sediment

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Units: Percent
Analysis Method: 8082A
Level: Low

Sample Name	Lab Code	Sur1
RM11E-PW001-SED	K1411753-001	75
RM11E-PW002-SED	K1411753-002	80
RM11E-PW003-SED	K1411753-003	77
RM11E-PW004-SED	K1411753-004	114 D
RM11E-PW005-SED	K1411753-005	79
RM11E-PW504-SED	K1411753-006	81 D
RM11E-PW006-SED	K1411753-007	84
Method Blank	KWG1501502-4	83
Method Blank	KWG1501737-4	69
RM11E-PW006-SEDMS	KWG1501502-1	86
RM11E-PW006-SEDDMS	KWG1501502-2	75
RM11E-PW001-SEDMS	KWG1501737-1	76
RM11E-PW001-SEDDMS	KWG1501737-2	72
Lab Control Sample	KWG1501502-3	89
Lab Control Sample	KWG1501737-3	72

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl 43-148

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	02/24/2015
Sample Matrix:	Sediment	**Date Analyzed:**	02/27/2015

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW006-SED	**Units:**	ug/Kg
Lab Code:	K1411753-007	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501502

		RM11E-PW006-SEDMS KWG1501502-1 Matrix Spike			RM11E-PW006-SEDDMS KWG1501502-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**%Rec**	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Aroclor 1016	ND	111	150	74	94.0	150	63	23-145	17	40
Aroclor 1260	ND	128	150	85	112	150	75	24-148	13	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.

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	03/03/2015
Sample Matrix:	Sediment	**Date Analyzed:**	03/05/2015

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW001-SED	**Units:**	ug/Kg
Lab Code:	K1411753-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501737

		RM11E-PW001-SEDMS KWG1501737-1 Matrix Spike			RM11E-PW001-SEDDMS KWG1501737-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**%Rec**	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Aroclor 1016	ND	115	130	88 #	98.0	130	76 #	23-145	16	40
Aroclor 1260	82	170	130	68	460	130	291 *	24-148	92 *	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.

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	02/24/2015
Sample Matrix:	Sediment	**Date Analyzed:**	02/27/2015

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8082A	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG1501502

	Lab Control Sample KWG1501502-3 Lab Control Spike			
Analyte Name	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**
Aroclor 1016	160	200	80	42-122
Aroclor 1260	190	200	95	50-124

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.

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	03/03/2015
Sample Matrix:	Sediment	**Date Analyzed:**	03/05/2015

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8082A	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG1501737

	Lab Control Sample KWG1501737-3 Lab Control Spike			
Analyte Name	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**
Aroclor 1016	142	200	71	42-122
Aroclor 1260	161	200	81	50-124

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:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	02/24/2015
Sample Matrix:	Sediment	**Date Analyzed:**	02/27/2015
		Time Analyzed:	17:00

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	**Instrument ID:**	GC27.i
Lab Code:	KWG1501502-4	**File ID:**	J:\GC27\DATA\022715.B\0227F006.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501502

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1501502-3	J:\GC27\DATA\022715.B\0227F005.D	02/27/15	16:36
RM11E-PW002-SED	K1411753-002	J:\GC27\DATA\022715.B\0227F008.D	02/27/15	17:48
RM11E-PW003-SED	K1411753-003	J:\GC27\DATA\022715.B\0227F009.D	02/27/15	18:12
RM11E-PW004-SED	K1411753-004	J:\GC27\DATA\022715.B\0227F010.D	02/27/15	18:36
RM11E-PW005-SED	K1411753-005	J:\GC27\DATA\022715.B\0227F011.D	02/27/15	19:00
RM11E-PW504-SED	K1411753-006	J:\GC27\DATA\022715.B\0227F012.D	02/27/15	19:24
RM11E-PW006-SED	K1411753-007	J:\GC27\DATA\022715.B\0227F015.D	02/27/15	20:36
RM11E-PW006-SEDMS	KWG1501502-1	J:\GC27\DATA\022715.B\0227F016.D	02/27/15	21:00
RM11E-PW006-SEDDMS	KWG1501502-2	J:\GC27\DATA\022715.B\0227F017.D	02/27/15	21:23

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	03/03/2015
Sample Matrix:	Sediment	**Date Analyzed:**	03/05/2015
		Time Analyzed:	12:10

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	Method Blank	**Instrument ID:**	GC27.i
Lab Code:	KWG1501737-4	**File ID:**	J:\GC27\DATA\030515.B\0305F008.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501737

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1501737-3	J:\GC27\DATA\030515.B\0305F007.D	03/05/15	11:46
RM11E-PW001-SED	K1411753-001	J:\GC27\DATA\030515.B\0305F009.D	03/05/15	12:34
RM11E-PW001-SEDMS	KWG1501737-1	J:\GC27\DATA\030515.B\0305F010.D	03/05/15	12:57
RM11E-PW001-SEDDMS	KWG1501737-2	J:\GC27\DATA\030515.B\0305F011.D	03/05/15	13:22

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	02/24/2015
Sample Matrix:	Sediment	**Date Analyzed:**	02/27/2015
		Time Analyzed:	16:36

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	Lab Control Sample	**Instrument ID:**	GC27.i
Lab Code:	KWG1501502-3	**File ID:**	J:\GC27\DATA\022715.B\0227F005.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501502

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1501502-4	J:\GC27\DATA\022715.B\0227F006.D	02/27/15	17:00
RM11E-PW002-SED	K1411753-002	J:\GC27\DATA\022715.B\0227F008.D	02/27/15	17:48
RM11E-PW003-SED	K1411753-003	J:\GC27\DATA\022715.B\0227F009.D	02/27/15	18:12
RM11E-PW004-SED	K1411753-004	J:\GC27\DATA\022715.B\0227F010.D	02/27/15	18:36
RM11E-PW005-SED	K1411753-005	J:\GC27\DATA\022715.B\0227F011.D	02/27/15	19:00
RM11E-PW504-SED	K1411753-006	J:\GC27\DATA\022715.B\0227F012.D	02/27/15	19:24
RM11E-PW006-SED	K1411753-007	J:\GC27\DATA\022715.B\0227F015.D	02/27/15	20:36
RM11E-PW006-SEDMS	KWG1501502-1	J:\GC27\DATA\022715.B\0227F016.D	02/27/15	21:00
RM11E-PW006-SEDDMS	KWG1501502-2	J:\GC27\DATA\022715.B\0227F017.D	02/27/15	21:23

QA/QC Report

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Extracted:**	03/03/2015
Sample Matrix:	Sediment	**Date Analyzed:**	03/05/2015
		Time Analyzed:	11:46

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

Sample Name:	Lab Control Sample	**Instrument ID:**	GC27.i
Lab Code:	KWG1501737-3	**File ID:**	J:\GC27\DATA\030515.B\0305F007.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A	**Extraction Lot:**	KWG1501737

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1501737-4	J:\GC27\DATA\030515.B\0305F008.D	03/05/15	12:10
RM11E-PW001-SED	K1411753-001	J:\GC27\DATA\030515.B\0305F009.D	03/05/15	12:34
RM11E-PW001-SEDMS	KWG1501737-1	J:\GC27\DATA\030515.B\0305F010.D	03/05/15	12:57
RM11E-PW001-SEDDMS	KWG1501737-2	J:\GC27\DATA\030515.B\0305F011.D	03/05/15	13:22

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i
Column: DB-35MS

Level ID	File ID
A	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F011.D
B	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F012.D
C	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F013.D
D	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F014.D
E	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F015.D
F	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F016.D
G	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F017.D
H	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F018.D
I	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F019.D
J	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F020.D
K	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F021.D
L	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F022.D
M	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F023.D
N	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F024.D
O	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F025.D
P	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F026.D
Q	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F027.D
R	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F028.D
S	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F029.D
T	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F030.D
U	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F031.D
V	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F032.D
W	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F033.D
X	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F034.D
Y	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F046.D
Z	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F047.D
AA	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F048.D
AB	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F049.D
AC	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F050.D
AD	\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F052.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Decachlorobiphenyl													Y	5.0	1.74E+5
	Z	50	1.80E+5	AA	100	1.55E+5	AB	200	1.37E+5	AC	500	1.37E+5	AD	2.5	1.65E+5
Aroclor 1016 {1}													Y	50	4000
	Z	500	4060	AA	1000	3530	AB	2000	3160	AC	5000	2890	AD	25	3890
Aroclor 1016 {2}													Y	50	3180
	Z	500	3510	AA	1000	3090	AB	2000	2640	AC	5000	2480	AD	25	3080
Aroclor 1016 {3}													Y	50	11100
	Z	500	11000	AA	1000	9830	AB	2000	8070	AC	5000	9210	AD	25	10100
Aroclor 1016 {4}													Y	50	5730
	Z	500	5650	AA	1000	4880	AB	2000	4330	AC	5000	4070	AD	25	5110
Aroclor 1016 {5}													Y	50	5740
	Z	500	5900	AA	1000	5120	AB	2000	4550	AC	5000	4370	AD	25	5370
Aroclor 1260 {1}													Y	50	11600
	Z	500	11100	AA	1000	9570	AB	2000	8330	AC	5000	8190	AD	25	10400
Aroclor 1260 {2}													Y	50	8920
	Z	500	9340	AA	1000	8030	AB	2000	6990	AC	5000	6900	AD	25	8500
Aroclor 1260 {3}													Y	50	9200
	Z	500	9530	AA	1000	8190	AB	2000	7130	AC	5000	7020	AD	25	8320
Aroclor 1260 {4}													Y	50	20700
	Z	500	21000	AA	1000	18200	AB	2000	16300	AC	5000	16800	AD	25	19800

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i
Column: DB-35MS

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Aroclor 1260 {5}													Y	50	15700
	Z	500	16200	AA	1000	14000	AB	2000	12400	AC	5000	12600	AD	25	14300

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i
Column: DB-35MS

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Decachlorobiphenyl	SURR	AverageRF	% RSD	11.7		≤ 20
Aroclor 1016 {1}	MULTI	AverageRF	% RSD	13.4		≤ 20
Aroclor 1016 {2}	MULTI	AverageRF	% RSD	12.5		≤ 20
Aroclor 1016 {3}	MULTI	AverageRF	% RSD	11.5		≤ 20
Aroclor 1016 {4}	MULTI	AverageRF	% RSD	13.6		≤ 20
Aroclor 1016 {5}	MULTI	AverageRF	% RSD	12.0		≤ 20
Aroclor 1260 {1}	MULTI	AverageRF	% RSD	14.3		≤ 20
Aroclor 1260 {2}	MULTI	AverageRF	% RSD	12.4		≤ 20
Aroclor 1260 {3}	MULTI	AverageRF	% RSD	12.5		≤ 20
Aroclor 1260 {4}	MULTI	AverageRF	% RSD	10.6		≤ 20
Aroclor 1260 {5}	MULTI	AverageRF	% RSD	11.0		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Calibration Date: 10/18/2014
Date Analyzed: 10/19/2014

Second Source Calibration Verification
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration ID: CAL13624
Units: ng/mL

File ID:
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F036.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F037.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F038.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F039.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F040.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F042.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F043.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F053.D
\\alklsws002\instdata\GC27\Data\101714CAL.b\1017F054.D

Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift		Criteria	Curve Fit
Aroclor 1016 {1}	1000	1300	3590	4530	26	NA		± 100 %	AverageRF
Aroclor 1016 {2}	1000	1200	3000	3720	24	NA		± 100 %	AverageRF
Aroclor 1016 {3}	1000	1200	9890	11900	20	NA		± 100 %	AverageRF
Aroclor 1016 {4}	1000	1100	4960	5570	12	NA		± 100 %	AverageRF
Aroclor 1016 {5}	1000	1200	5180	6170	19	NA		± 100 %	AverageRF
Aroclor 1016	1000	1200	NA	NA	NA	20	*	± 20 %	NA
Aroclor 1260 {1}	1000	1100	9850	10300	5	NA		± 100 %	AverageRF
Aroclor 1260 {2}	1000	1300	8110	10300	27	NA		± 100 %	AverageRF
Aroclor 1260 {3}	1000	1200	8230	10200	24	NA		± 100 %	AverageRF
Aroclor 1260 {4}	1000	1200	18800	22900	22	NA		± 100 %	AverageRF
Aroclor 1260 {5}	1000	1200	14200	17200	21	NA		± 100 %	AverageRF
Aroclor 1260	1000	1200	NA	NA	NA	20		± 20 %	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

† **SPCC Compound** ‡ **CCC Compound**

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i

Column: DB-XLB

Level ID	File ID
A	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F011.D
B	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F012.D
C	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F013.D
D	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F014.D
E	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F015.D
F	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F016.D
G	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F017.D
H	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F018.D
I	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F019.D
J	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F020.D
K	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F021.D
L	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F022.D
M	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F023.D
N	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F024.D
O	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F025.D
P	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F026.D
Q	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F027.D
R	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F028.D
S	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F029.D
T	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F030.D
U	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F031.D
V	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F032.D
W	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F033.D
X	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F034.D
Y	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F046.D
Z	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F047.D
AA	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F048.D
AB	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F049.D
AC	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F050.D
AD	\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F052.D

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Decachlorobiphenyl													Y	5.0	97700
	Z	50	81000	AA	100	79500	AB	200	74900	AC	500	66600	AD	2.5	94400
Aroclor 1016 {1}													Y	50	2030
	Z	500	1810	AA	1000	1770	AB	2000	1610				AD	25	1960
Aroclor 1016 {2}													Y	50	2670
	Z	500	2380	AA	1000	2310	AB	2000	2120				AD	25	2700
Aroclor 1016 {3}													Y	50	3400
	Z	500	2970	AA	1000	2890	AB	2000	2620				AD	25	3100
Aroclor 1016 {4}													Y	50	2520
	Z	500	2160	AA	1000	2110	AB	2000	1930				AD	25	2260
Aroclor 1016 {5}													Y	50	2500
	Z	500	2130	AA	1000	2080	AB	2000	1930				AD	25	2140
Aroclor 1260 {1}													Y	50	2520
	Z	500	2230	AA	1000	2200	AB	2000	2070	AC	5000	1760	AD	25	2450
Aroclor 1260 {2}													Y	50	4610
	Z	500	3740	AA	1000	3690	AB	2000	3490	AC	5000	3090	AD	25	4050
Aroclor 1260 {3}													Y	50	4460
	Z	500	3540	AA	1000	3470	AB	2000	3290	AC	5000	2920	AD	25	3960
Aroclor 1260 {4}													Y	50	10300
	Z	500	8380	AA	1000	8380	AB	2000	8090	AC	5000	7460	AD	25	9170

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i
Column: DB-XLB

Analyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
Aroclor 1260 {5}													Y	50	6810
	Z	500	5490	AA	1000	5410	AB	2000	5150	AC	5000	4630	AD	25	6020

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Calibration Date: 10/18/2014

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

Calibration ID: CAL13624
Instrument ID: GC27.i

Column: DB-XLB

Analyte Name	Compound Type	Calibration Evaluation				
		Fit Type	Eval.	Eval. Result	Q	Control Criteria
Decachlorobiphenyl	SURR	AverageRF	% RSD	14.3		≤ 20
Aroclor 1016 {1}	MULTI	AverageRF	% RSD	9.0		≤ 20
Aroclor 1016 {2}	MULTI	AverageRF	% RSD	10.1		≤ 20
Aroclor 1016 {3}	MULTI	AverageRF	% RSD	9.5		≤ 20
Aroclor 1016 {4}	MULTI	AverageRF	% RSD	9.8		≤ 20
Aroclor 1016 {5}	MULTI	AverageRF	% RSD	9.8		≤ 20
Aroclor 1260 {1}	MULTI	AverageRF	% RSD	12.5		≤ 20
Aroclor 1260 {2}	MULTI	AverageRF	% RSD	13.6		≤ 20
Aroclor 1260 {3}	MULTI	AverageRF	% RSD	14.9		≤ 20
Aroclor 1260 {4}	MULTI	AverageRF	% RSD	11.6		≤ 20
Aroclor 1260 {5}	MULTI	AverageRF	% RSD	13.5		≤ 20

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Calibration Date: 10/18/2014
Date Analyzed: 10/19/2014

Second Source Calibration Verification
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration ID: CAL13624
Units: ng/mL

File ID:
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F036.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F037.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F038.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F039.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F040.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F042.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F043.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F053.D
\\alklsws002\instdata\GC27\Data\101714CAL_r.b\1017F054.D

Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift		Criteria	Curve Fit
Aroclor 1016 {1}	1000	1100	1840	1970	7	NA		± 100 %	AverageRF
Aroclor 1016 {2}	1000	1000	2430	2530	4	NA		± 100 %	AverageRF
Aroclor 1016 {3}	1000	1100	3000	3170	6	NA		± 100 %	AverageRF
Aroclor 1016 {4}	1000	1000	2200	2290	4	NA		± 100 %	AverageRF
Aroclor 1016 {5}	1000	1100	2160	2300	6	NA		± 100 %	AverageRF
Aroclor 1016	1000	1100	NA	NA	NA	5		± 20 %	NA
Aroclor 1260 {1}	1000	1200	2210	2590	17	NA		± 100 %	AverageRF
Aroclor 1260 {2}	1000	1300	3780	4910	30	NA		± 100 %	AverageRF
Aroclor 1260 {3}	1000	1200	3610	4410	22	NA		± 100 %	AverageRF
Aroclor 1260 {4}	1000	1200	8630	10700	24	NA		± 100 %	AverageRF
Aroclor 1260 {5}	1000	1200	5590	6680	20	NA		± 100 %	AverageRF
Aroclor 1260	1000	1200	NA	NA	NA	23	*	± 20 %	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

† **SPCC Compound** ‡ **CCC Compound**

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715.B\0227F003.D

Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	45	158000	142000	-10	NA	± 20	AverageRF
Aroclor 1016 {1}	500	470	3590	3380	-6	NA	± 100	AverageRF
Aroclor 1016 {2}	500	450	3000	2720	-9	NA	± 100	AverageRF
Aroclor 1016 {3}	500	380	9890	7620	-23	NA	± 100	AverageRF
Aroclor 1016 {4}	500	420	4960	4120	-17	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	5180	4180	-19	NA	± 100	AverageRF
Aroclor 1016	500	430	NA	NA	NA	-15	± 20	NA
Aroclor 1260 {1}	500	400	9850	7910	-20	NA	± 100	AverageRF
Aroclor 1260 {2}	500	430	8110	6960	-14	NA	± 100	AverageRF
Aroclor 1260 {3}	500	430	8230	7100	-14	NA	± 100	AverageRF
Aroclor 1260 {4}	500	430	18800	16100	-14	NA	± 100	AverageRF
Aroclor 1260 {5}	500	450	14200	12700	-11	NA	± 100	AverageRF
Aroclor 1260	500	430	NA	NA	NA	-15	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A
Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL
File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715_R.B\0227F003.D
Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	46	82400	76200	-8	NA	± 20	AverageRF
Aroclor 1016 {1}	500	440	1840	1630	-11	NA	± 100	AverageRF
Aroclor 1016 {2}	500	450	2430	2210	-9	NA	± 100	AverageRF
Aroclor 1016 {3}	500	400	3000	2380	-21	NA	± 100	AverageRF
Aroclor 1016 {4}	500	400	2200	1770	-19	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	2160	1740	-19	NA	± 100	AverageRF
Aroclor 1016	500	420	NA	NA	NA	-16	± 20	NA
Aroclor 1260 {1}	500	420	2210	1870	-15	NA	± 100	AverageRF
Aroclor 1260 {2}	500	450	3780	3430	-9	NA	± 100	AverageRF
Aroclor 1260 {3}	500	450	3610	3280	-9	NA	± 100	AverageRF
Aroclor 1260 {4}	500	450	8630	7790	-10	NA	± 100	AverageRF
Aroclor 1260 {5}	500	460	5590	5170	-7	NA	± 100	AverageRF
Aroclor 1260	500	450	NA	NA	NA	-10	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715.B\0227F013.D

Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	44	158000	140000	-11	NA	± 20	AverageRF
Aroclor 1016 {1}	500	460	3590	3270	-9	NA	± 100	AverageRF
Aroclor 1016 {2}	500	450	3000	2670	-11	NA	± 100	AverageRF
Aroclor 1016 {3}	500	400	9890	7860	-21	NA	± 100	AverageRF
Aroclor 1016 {4}	500	400	4960	3960	-20	NA	± 100	AverageRF
Aroclor 1016 {5}	500	390	5180	4040	-22	NA	± 100	AverageRF
Aroclor 1016	500	420	NA	NA	NA	-16	± 20	NA
Aroclor 1260 {1}	500	390	9850	7730	-21	NA	± 100	AverageRF
Aroclor 1260 {2}	500	420	8110	6820	-16	NA	± 100	AverageRF
Aroclor 1260 {3}	500	420	8230	6970	-15	NA	± 100	AverageRF
Aroclor 1260 {4}	500	420	18800	15900	-15	NA	± 100	AverageRF
Aroclor 1260 {5}	500	440	14200	12400	-13	NA	± 100	AverageRF
Aroclor 1260	500	420	NA	NA	NA	-16	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715_R.B\0227F013.D

Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	46	82400	75400	-8	NA	± 20	AverageRF
Aroclor 1016 {1}	500	440	1840	1600	-13	NA	± 100	AverageRF
Aroclor 1016 {2}	500	460	2430	2240	-8	NA	± 100	AverageRF
Aroclor 1016 {3}	500	400	3000	2370	-21	NA	± 100	AverageRF
Aroclor 1016 {4}	500	400	2200	1740	-21	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	2160	1720	-20	NA	± 100	AverageRF
Aroclor 1016	500	420	NA	NA	NA	-17	± 20	NA
Aroclor 1260 {1}	500	430	2210	1880	-15	NA	± 100	AverageRF
Aroclor 1260 {2}	500	450	3780	3400	-10	NA	± 100	AverageRF
Aroclor 1260 {3}	500	450	3610	3220	-11	NA	± 100	AverageRF
Aroclor 1260 {4}	500	450	8630	7840	-9	NA	± 100	AverageRF
Aroclor 1260 {5}	500	460	5590	5090	-9	NA	± 100	AverageRF
Aroclor 1260	500	450	NA	NA	NA	-11	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715.B\0227F019.D

Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	45	158000	143000	-10	NA	± 20	AverageRF
Aroclor 1016 {1}	500	470	3590	3390	-5	NA	± 100	AverageRF
Aroclor 1016 {2}	500	460	3000	2750	-8	NA	± 100	AverageRF
Aroclor 1016 {3}	500	420	9890	8230	-17	NA	± 100	AverageRF
Aroclor 1016 {4}	500	410	4960	4050	-18	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	5180	4180	-19	NA	± 100	AverageRF
Aroclor 1016	500	430	NA	NA	NA	-14	± 20	NA
Aroclor 1260 {1}	500	400	9850	7930	-19	NA	± 100	AverageRF
Aroclor 1260 {2}	500	430	8110	6950	-14	NA	± 100	AverageRF
Aroclor 1260 {3}	500	430	8230	7110	-14	NA	± 100	AverageRF
Aroclor 1260 {4}	500	430	18800	16000	-15	NA	± 100	AverageRF
Aroclor 1260 {5}	500	450	14200	12600	-11	NA	± 100	AverageRF
Aroclor 1260	500	430	NA	NA	NA	-15	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 02/27/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501725
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\022715_R.B\0227F019.D

Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	47	82400	76700	-7	NA	± 20	AverageRF
Aroclor 1016 {1}	500	430	1840	1590	-13	NA	± 100	AverageRF
Aroclor 1016 {2}	500	450	2430	2200	-9	NA	± 100	AverageRF
Aroclor 1016 {3}	500	390	3000	2350	-22	NA	± 100	AverageRF
Aroclor 1016 {4}	500	390	2200	1710	-22	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	2160	1700	-21	NA	± 100	AverageRF
Aroclor 1016	500	410	NA	NA	NA	-17	± 20	NA
Aroclor 1260 {1}	500	420	2210	1860	-16	NA	± 100	AverageRF
Aroclor 1260 {2}	500	470	3780	3520	-7	NA	± 100	AverageRF
Aroclor 1260 {3}	500	450	3610	3230	-10	NA	± 100	AverageRF
Aroclor 1260 {4}	500	460	8630	7900	-9	NA	± 100	AverageRF
Aroclor 1260 {5}	500	460	5590	5110	-9	NA	± 100	AverageRF
Aroclor 1260	500	450	NA	NA	NA	-10	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Date Analyzed: 03/05/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A
Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501914
Units: ng/mL
File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\030515.B\0305F005.D
Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	45	158000	142000	-10	NA	± 20	AverageRF
Aroclor 1016 {1}	500	440	3590	3170	-12	NA	± 100	AverageRF
Aroclor 1016 {2}	500	420	3000	2530	-16	NA	± 100	AverageRF
Aroclor 1016 {3}	500	360	9890	7060	-29	NA	± 100	AverageRF
Aroclor 1016 {4}	500	390	4960	3910	-21	NA	± 100	AverageRF
Aroclor 1016 {5}	500	380	5180	3960	-24	NA	± 100	AverageRF
Aroclor 1016	500	400	NA	NA	NA	-20	± 20	NA
Aroclor 1260 {1}	500	390	9850	7600	-23	NA	± 100	AverageRF
Aroclor 1260 {2}	500	410	8110	6680	-18	NA	± 100	AverageRF
Aroclor 1260 {3}	500	420	8230	6930	-16	NA	± 100	AverageRF
Aroclor 1260 {4}	500	420	18800	15700	-16	NA	± 100	AverageRF
Aroclor 1260 {5}	500	430	14200	12300	-14	NA	± 100	AverageRF
Aroclor 1260	500	410	NA	NA	NA	-17	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 03/05/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501914
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\030515_R.B\0305F005.D

Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
Decachlorobiphenyl	50	46	82400	75000	-9	NA		± 20	AverageRF
Aroclor 1016 {1}	500	420	1840	1530	-17	NA		± 100	AverageRF
Aroclor 1016 {2}	500	430	2430	2100	-14	NA		± 100	AverageRF
Aroclor 1016 {3}	500	370	3000	2200	-27	NA		± 100	AverageRF
Aroclor 1016 {4}	500	380	2200	1670	-24	NA		± 100	AverageRF
Aroclor 1016 {5}	500	380	2160	1650	-24	NA		± 100	AverageRF
Aroclor 1016	500	400	NA	NA	NA	-21	*	± 20	NA
Aroclor 1260 {1}	500	410	2210	1810	-18	NA		± 100	AverageRF
Aroclor 1260 {2}	500	440	3780	3300	-13	NA		± 100	AverageRF
Aroclor 1260 {3}	500	430	3610	3120	-14	NA		± 100	AverageRF
Aroclor 1260 {4}	500	440	8630	7640	-12	NA		± 100	AverageRF
Aroclor 1260 {5}	500	450	5590	5000	-11	NA		± 100	AverageRF
Aroclor 1260	500	430	NA	NA	NA	-13		± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753
Date Analyzed: 03/05/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A
Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501914
Units: ng/mL
File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\030515.B\0305F012.D
Column ID: DB-35MS

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Decachlorobiphenyl	50	45	158000	141000	-11	NA	± 20	AverageRF
Aroclor 1016 {1}	500	470	3590	3340	-7	NA	± 100	AverageRF
Aroclor 1016 {2}	500	470	3000	2820	-6	NA	± 100	AverageRF
Aroclor 1016 {3}	500	420	9890	8270	-16	NA	± 100	AverageRF
Aroclor 1016 {4}	500	420	4960	4120	-17	NA	± 100	AverageRF
Aroclor 1016 {5}	500	400	5180	4150	-20	NA	± 100	AverageRF
Aroclor 1016	500	430	NA	NA	NA	-13	± 20	NA
Aroclor 1260 {1}	500	390	9850	7700	-22	NA	± 100	AverageRF
Aroclor 1260 {2}	500	410	8110	6670	-18	NA	± 100	AverageRF
Aroclor 1260 {3}	500	410	8230	6820	-17	NA	± 100	AverageRF
Aroclor 1260 {4}	500	420	18800	15700	-16	NA	± 100	AverageRF
Aroclor 1260 {5}	500	430	14200	12200	-14	NA	± 100	AverageRF
Aroclor 1260	500	410	NA	NA	NA	-17	± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm
Project: RM 11E

Service Request: K1411753
Date Analyzed: 03/05/2015

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

Calibration Type: External Standard
Analysis Method: 8082A

Calibration Date: 10/18/2014
Calibration ID: CAL13624
Analysis Lot: KWG1501914
Units: ng/mL

File ID: \\ALKLSWS002\INSTDATA\GC27\DATA\030515_R.B\0305F012.D

Column ID: DB-XLB

Analyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
Decachlorobiphenyl	50	45	82400	73700	-11	NA		± 20	AverageRF
Aroclor 1016 {1}	500	420	1840	1540	-16	NA		± 100	AverageRF
Aroclor 1016 {2}	500	440	2430	2150	-11	NA		± 100	AverageRF
Aroclor 1016 {3}	500	360	3000	2190	-27	NA		± 100	AverageRF
Aroclor 1016 {4}	500	370	2200	1640	-25	NA		± 100	AverageRF
Aroclor 1016 {5}	500	380	2160	1620	-25	NA		± 100	AverageRF
Aroclor 1016	500	400	NA	NA	NA	-21	*	± 20	NA
Aroclor 1260 {1}	500	400	2210	1760	-20	NA		± 100	AverageRF
Aroclor 1260 {2}	500	420	3780	3200	-15	NA		± 100	AverageRF
Aroclor 1260 {3}	500	420	3610	3060	-15	NA		± 100	AverageRF
Aroclor 1260 {4}	500	430	8630	7480	-13	NA		± 100	AverageRF
Aroclor 1260 {5}	500	440	5590	4860	-13	NA		± 100	AverageRF
Aroclor 1260	500	420	NA	NA	NA	-15		± 20	NA

Results flagged with an asterisk (*) indicate values outside control criteria.

Client: Science and Engineering for the Environm **Service Request:** K1411753
Project: RM 11E

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

Analysis Method: 8082A **Analysis Lot:** KWG1501725
Instrument ID: GC27.i
Column: DB-35MS

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0227F003.D	Continuing Calibration Verification	KWG1501725-1	2/27/2015	15:48		2/27/2015	15:48
0227F004.D	Instrument Blank	KWG1501725-2	2/27/2015	16:12		2/27/2015	16:12
0227F005.D	Lab Control Sample	KWG1501502-3	2/27/2015	16:36		2/27/2015	16:36
0227F006.D	Method Blank	KWG1501502-4	2/27/2015	17:00		2/27/2015	17:00
0227F007.D	ZZZZZZ	ZZZZZZ	2/27/2015	17:24		2/27/2015	17:24
0227F008.D	RM11E-PW002-SED	K1411753-002	2/27/2015	17:48		2/27/2015	17:48
0227F009.D	RM11E-PW003-SED	K1411753-003	2/27/2015	18:12		2/27/2015	18:12
0227F010.D	RM11E-PW004-SED	K1411753-004	2/27/2015	18:36		2/27/2015	18:36
0227F011.D	RM11E-PW005-SED	K1411753-005	2/27/2015	19:00		2/27/2015	19:00
0227F012.D	RM11E-PW504-SED	K1411753-006	2/27/2015	19:24		2/27/2015	19:24
0227F013.D	Continuing Calibration Verification	KWG1501725-3	2/27/2015	19:48		2/27/2015	19:48
0227F014.D	Instrument Blank	KWG1501725-4	2/27/2015	20:12		2/27/2015	20:12
0227F015.D	RM11E-PW006-SED	K1411753-007	2/27/2015	20:36		2/27/2015	20:36
0227F016.D	RM11E-PW006-SEDMS	KWG1501502-1	2/27/2015	21:00		2/27/2015	21:00
0227F017.D	RM11E-PW006-SEDDMS	KWG1501502-2	2/27/2015	21:23		2/27/2015	21:23
0227F019.D	Continuing Calibration Verification	KWG1501725-5	2/27/2015	22:11		2/27/2015	22:11
0227F020.D	Instrument Blank	KWG1501725-6	2/27/2015	22:35		2/27/2015	22:35

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Service Request: K1411753

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

Analysis Method: 8082A
Analysis Lot: KWG1501914
Instrument ID: GC27.i
Column: DB-35MS

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0305F005.D	Continuing Calibration Verification	KWG1501914-1	3/5/2015	10:59		3/5/2015	10:59
0305F006.D	Instrument Blank	KWG1501914-2	3/5/2015	11:23		3/5/2015	11:23
0305F007.D	Lab Control Sample	KWG1501737-3	3/5/2015	11:46		3/5/2015	11:46
0305F008.D	Method Blank	KWG1501737-4	3/5/2015	12:10		3/5/2015	12:10
0305F009.D	RM11E-PW001-SED	K1411753-001	3/5/2015	12:34		3/5/2015	12:34
0305F010.D	RM11E-PW001-SEDMS	KWG1501737-1	3/5/2015	12:57		3/5/2015	12:57
0305F011.D	RM11E-PW001-SEDDMS	KWG1501737-2	3/5/2015	13:22		3/5/2015	13:22
0305F012.D	Continuing Calibration Verification	KWG1501914-3	3/5/2015	13:45		3/5/2015	13:45
0305F013.D	Instrument Blank	KWG1501914-4	3/5/2015	14:09		3/5/2015	14:09
0305F014.D	ZZZZZZ	ZZZZZZ	3/5/2015	14:33		3/5/2015	14:33
0305F015.D	ZZZZZZ	ZZZZZZ	3/5/2015	14:57		3/5/2015	14:57
0305F016.D	ZZZZZZ	ZZZZZZ	3/5/2015	15:21		3/5/2015	15:21
0305F017.D	ZZZZZZ	ZZZZZZ	3/5/2015	15:45		3/5/2015	15:45
0305F018.D	ZZZZZZ	ZZZZZZ	3/5/2015	16:09		3/5/2015	16:09
0305F019.D	ZZZZZZ	ZZZZZZ	3/5/2015	16:32		3/5/2015	16:32
0305F020.D	ZZZZZZ	ZZZZZZ	3/5/2015	16:56		3/5/2015	16:56
0305F021.D	ZZZZZZ	ZZZZZZ	3/5/2015	17:20		3/5/2015	17:20
0305F022.D	ZZZZZZ	ZZZZZZ	3/5/2015	17:44		3/5/2015	17:44
0305F023.D	Continuing Calibration Verification	KWG1501914-5	3/5/2015	18:08		3/5/2015	18:08
0305F024.D	Instrument Blank	KWG1501914-6	3/5/2015	18:32		3/5/2015	18:32
0305F025.D	ZZZZZZ	ZZZZZZ	3/5/2015	18:56		3/5/2015	18:56
0305F026.D	ZZZZZZ	ZZZZZZ	3/5/2015	19:20		3/5/2015	19:20
0305F027.D	ZZZZZZ	ZZZZZZ	3/5/2015	19:44		3/5/2015	19:44
0305F028.D	ZZZZZZ	ZZZZZZ	3/5/2015	20:08		3/5/2015	20:08
0305F029.D	ZZZZZZ	ZZZZZZ	3/5/2015	20:32		3/5/2015	20:32
0305F030.D	ZZZZZZ	ZZZZZZ	3/5/2015	20:55		3/5/2015	20:55
0305F031.D	Continuing Calibration Verification	KWG1501914-7	3/5/2015	21:19		3/5/2015	21:19
0305F032.D	Instrument Blank	KWG1501914-8	3/5/2015	21:43		3/5/2015	21:43

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Sample Matrix: Sediment

Service Request: K1411753
Date Extracted: 02/24/2015

Extraction Prep Log
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082A

Extraction Lot: KWG1501502
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
RM11E-PW002-SED	K1411753-002	10/20/14	10/22/14	40.333g	4ml	60.6	
RM11E-PW003-SED	K1411753-003	10/20/14	10/22/14	40.004g	4ml	60.7	
RM11E-PW004-SED	K1411753-004	10/20/14	10/22/14	40.142g	4ml	70.8	
RM11E-PW005-SED	K1411753-005	10/20/14	10/22/14	40.189g	4ml	70.5	
RM11E-PW504-SED	K1411753-006	10/20/14	10/22/14	40.154g	4ml	78	
RM11E-PW006-SED	K1411753-007	10/20/14	10/22/14	40.400g	4ml	66.5	
Method Blank	KWG1501502-4	NA	NA	40.400g	4ml	NA	
RM11E-PW006-SEDMS	KWG1501502-1	10/20/14	10/22/14	40.011g	4ml	66.5	
RM11E-PW006-SEDDMS	KWG1501502-2	10/20/14	10/22/14	40.048g	4ml	66.5	
Lab Control Sample	KWG1501502-3	NA	NA	20.000g	4ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: Science and Engineering for the Environm
Project: RM 11E
Sample Matrix: Sediment

Service Request: K1411753
Date Extracted: 03/03/2015

Extraction Prep Log
Polychlorinated Biphenyls (PCBs)

Extraction Method: EPA 3541
Analysis Method: 8082A

Extraction Lot: KWG1501737
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
RM11E-PW001-SED	K1411753-001	10/20/14	10/22/14	40.083g	4ml	76.5	
Method Blank	KWG1501737-4	NA	NA	40.376g	4ml	NA	
RM11E-PW001-SEDMS	KWG1501737-1	10/20/14	10/22/14	40.268g	4ml	76.5	
RM11E-PW001-SEDDMS	KWG1501737-2	10/20/14	10/22/14	40.376g	4ml	76.5	
Lab Control Sample	KWG1501737-3	NA	NA	20.000g	4ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	03/03/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW001-SED	**Units:**	ug/Kg
Lab Code:	K1411753-001	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	6.6	2.1	82	85	3.6		1	03/05/15

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	02/24/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW002-SED	**Units:**	ug/Kg
Lab Code:	K1411753-002	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	8.2	2.1	170	190	11.1		1	02/27/15

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	02/24/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW003-SED	**Units:**	ug/Kg
Lab Code:	K1411753-003	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	8.3	2.1	120	130	8.0		1	02/27/15

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	02/24/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW004-SED	**Units:**	ug/Kg
Lab Code:	K1411753-004	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	71	21	1600	1700	6.1	D	10	02/27/15

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	02/24/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW005-SED	**Units:**	ug/Kg
Lab Code:	K1411753-005	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	7.1	2.1	55	56	1.8		1	02/27/15

Confirmation Results

Client:	Science and Engineering for the Environm	**Service Request:**	K1411753
Project:	RM 11E	**Date Collected:**	10/20/2014
Sample Matrix:	Sediment	**Date Received:**	10/22/2014
		Date Extracted:	02/24/2015

Polychlorinated Biphenyls (PCBs)

Sample Name:	RM11E-PW504-SED	**Units:**	ug/Kg
Lab Code:	K1411753-006	**Basis:**	Dry
		Level:	Low
Extraction Method:	EPA 3541		
Analysis Method:	8082A		

Analyte Name	MRL	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Aroclor 1260	32	11	920	1000	8.3	D	5	02/27/15

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February 27, 201

Analytical Report for Service Request No: K1 01 8

Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810

RE: RM11E Supplemental RI/FS Investigation

Dear Tim,

Enclosed are the results of the sample(s) submitted to our laboratory October 22, 2014
For your reference, these analyses have been assigned our service re uest number **K1501568.**

Analyses were performed according to our laboratory s NELAP-approved uality assurance program. The test results meet re uirements of the current NELAP standards, where applicable, and e cept as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group SA Corp. dba ALS Environmental (ALS) 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) analy ed, as listed in the report.

Please contact me if you have any uestions. My e tension is 331 . ou may also contact me via email at eff.Christian alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

eff Christian
Director of Operations
- Western SA

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
LOD	Limit of Detection
LOQ	Limit of Quantitation
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 as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
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 analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
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 or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

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 as defined by the DOD or NELAC standards.
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 estimated value.
J	The result is an estimated value.
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.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

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.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment, LLC	**Service Request No.:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Received:**	08/17/14-10/22/14
Sample Matrix:	PE		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Four PE samples were received for analysis at ALS Environmental between 08/17/14 and 10/22/14. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory. These samples were originally logged under Service Requests K1408725 and K1411748.

Chlorinated Biphenyl Congeners

This analysis was performed at ALS Houston, Texas Laboratory. The data for this analysis is included in the corresponding section of this report.

Approved by_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

CHAIN OF CUSTODY

ALS Environmental

Sediment and Tissue Chemistry

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SR#: KH08725

PAGE 1 OF 2 COC# 08172014

PROJECT NAME: RMIIE
PROJECT NUMBER:
PROJECT MANAGER: Tim Thompson
COMPANY NAME: SEE
ADDRESS: 4401 Latona Ave NE
CITY/STATE/ZIP: Seattle, WA
E-MAIL ADDRESS: tthompson@seellc.com
PHONE #: 206 453 6173 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Total Volatile Solids / Total Solids	TOC (ASTM D4129M) / PSEP	Grain Size / PSEP / ASTM D422	Sulfide / Total (9030M) / PSEP / Water Soluble	AVS / SEM (metals list below)	Ammonia / Total (350.1M) / Plumb / Pore Water	Metals (list below)	Pesticides (8081)	PCBs (8082) / Aroclors / Congeners (Low LEV EL, HRC5)	Semivolatiles / GC/MS SIM (PAH) / 8270-L	Organotins / Bulk / Pore Water / TBT only	Volatiles (8260)	Dioxins / 1613 / 8290	TPH / GRO / DRO / RRO	Lipids	Tissue Sample Preparations (instructions below)				REMARKS
PW001A TO	8/17/14	10:38		P.E.	1									✓											
PW001B TO	8/17/14	10:38		PE	1									A											
PW002A TO	8/17/14	11:08		PE	1									✓											
PW002B TO	8/17/14	11:08		PE	1									A											
PW003A TO	8/17/14	11:33		PE	1									✓											
PW003B TO	"	"		"	1									A											
PW004A TO	"	12:02		"	1									✓											
PW004B TO	"	"		"	1									A											
PW005A TO	"	12:26		"	1									✓											
PW005B TO	"	12:26		"	1									A											A → B 8/21/14

A= Archive

REPORT REQUIREMENTS

✓ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: SEE

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
✓ 5 day
___ Standard (15 working days)

Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn
CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn
SEM Metals: Cd Cu Pb Hg Ni Zn
Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

SPECIAL INSTRUCTIONS/COMMENTS:

Analyze PCBs for PRC congeners per RMIIE work plan
Archive samples at -20°C

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [signature] Date/Time: 8/17/2014	Signature: [signature] Date/Time: 8/18/14 13:44	Signature: Date/Time:	Signature: Date/Time:
Printed Name: Tim Thompson Firm: SEE	Printed Name: Matthew Hall Firm: HLS	Printed Name: Firm:	Printed Name: Firm:

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ALS Environmental

CHAIN OF CUSTODY

Sediment and Tissue Chemistry

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SR#: K1408926

PAGE 2 OF 2 COC# 08172014

PROJECT NAME: RMIIE
PROJECT NUMBER:
PROJECT MANAGER: Tim Thompson
COMPANY NAME: SEE
ADDRESS: 4401 Latona Ave NE
CITY/STATE/ZIP: Seattle, WA
E-MAIL ADDRESS: tthompson@seellc.com
PHONE #: 206 418 6133 FAX #:
SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Total Volatile Solids / Total Solids	TOC / (ASTM D4129M) / PSEP	Grain Size / PSEP / ASTMD422	Sulfide / Total (9030M) / PSEP / Water Soluble	AVS / SEM (metals list below)	Ammonia / Total (350.1M) / Plumb / Pore Water	Metals (list below)	Pesticides (8081)	PCBs (8082) / Aroclors / Congeners	Semivolatiles / GC/MS SIM (PAH) / 8270-L	Organotins / Bulk / Pore Water	Volatiles (8260)	Dioxins / 1613 / 8290	TPH / GRO / DRO / RRO	Lipids	Tissue Sample Preparations (instructions below)				REMARKS
PW006A	8/17/14	1240		PE	1									✓											
PW006B	"	1240		PE	1									A											
PW007A	"	1302		PE	1									✓											
PW007B	"	1302		PE	1									A											

REPORT REQUIREMENTS

✓ I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. CLP Like Summary (no raw data)
___ IV. Data Validation Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: SEE

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 day
✓ Standard (15 working days)

Requested Report Date

Circle which metals are to be analyzed: A = Archive

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn
CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn
SEM Metals: Cd Cu Pb Hg Ni Zn
Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

SPECIAL INSTRUCTIONS/COMMENTS:

Reanalyze PCBs for DBC congeners per RMIIE Work Plan.

Archive samples at -20C

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature	Date/Time 13:44	Signature	Date/Time 8/17/14 13:44	Signature	Date/Time	Signature	Date/Time
Printed Name Tim Thompson	Firm SEE	Printed Name Matthew Hall	Firm ALS	Printed Name	Firm	Printed Name	Firm

Copyright 2012 by ALS Group

PC Jeff Christian

Cooler Receipt and Preservation Form

Client / Project: SFE Service Request *K14* 8725

Received: 8/18/14 Opened: 8/18/14 By: KD Unloaded: 8/18/14 By: KD

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *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

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
nm	—	—	—	—	—			

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* N/A
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:
PW005A TO	PW005B TO	process of elimination

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Page ____ *of* ____

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • (800) 695-7222 x 07 • FAX (360) 636-1068

DATE 10/21/2014 PAGE 2 OF

PROJECT NAME RM11E #

PROJECT MANAGER Tim Thompson

COMPANY NAME SEE, LLC

ADDRESS 4401 Latona Ave NE Seattle, WA 98105

PHONE 206 418 6173

SAMPLERS SIGNATURE

ANALYSIS REQUESTED K1411748

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PCB Congeners	Archive	MIT (PCBs)	REMARKS
RM11E-PWW504	10/20/14	1305		PE	1	X			
RM11E-PWP504	10/20/14	1305		PE	1	X			
RM11E-PWW004B	10/20/14	1305		PE	1		X		
RM11E-PWP004B	10/20/14	1305		PE	1		X		
RM11E-PWP004A	10/20/14	1305		PE	2	X		X	
RM11E-PWW004A	10/20/14	1305		PE	2	X		X	
RM11E-PWW003A	10/20/14			PE	2	X	X		
RM11E-PWP003A	10/20/14			PE	2	X	X		
RM11E-PWW003B	10/20/14			PE	1		X		
RM11E-PWP003B	10/20/14			PE	1		X		

REPORT REQUIREMENTS

- ✓ I. Routine Report: Method Blank, Surrogate, as required
- ✓ II. Report Dup., MS, MSD as required
- III. CLP Like Summary (no raw data)
- IV. Data Validation Report
- ✓ V. EDD

INVOICE INFORMATION

P.O. #

Bill To: SEE, LLC
4401 Latona NE
Seattle, WA 98105

TURNAROUND REQUIREMENTS

- 24 hr. 48 hr. 5 day
- ✓ Standard (10-15 working days)
- Provide Verbal Preliminary Results
- Provide FAX preliminary 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 Tl 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 Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:
*Sample ID's are very similar w/ same date time. Pay close attention to sample ID's

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: 10/21/14	Signature: Karla Smith 10/21/14 1702	Signature	Signature: Karla Smith 10/22/14 0802
Date/Time	Date/Time	Date/Time	Date/Time
Printed Name:	Printed Name: Karla Smith	Printed Name	Printed Name: Karla Smith
Firm: SEE	Firm: ALS	Firm	Firm: ALS

DISTRIBUTION: WHITE - return to originator: YELLOW - lab: PINK - retained by originator

COC blank 2-2013

PC Christian

Cooler Receipt and Preservation Form

Client / Project: SEE Service Request K14 11748

Received: 10/22/14 Opened: 10/22/14 By: KD Unloaded: 10/22/14 By: KD

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
nm	—	—	—	—	—			

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* N/A
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Page ____ *of* ____

Chlorinated Biphenyl Congeners

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

February 26, 2015 Service Request No: K1501568

Jeff Christian.

ALS Environmental
1317 South 13th Avenue
Kelso, WA 98626

Laboratory Result for: Science and Engineering for the Environment, LLC.
Dear Jeff:

Enclosed are the results of the sample(s) submitted to our laboratory on February 18, 2015. For Your reference, these analyses have been assigned our service request number: **K1501568.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My direct line is 281-575-2279. You may also contact me via email at Arthi.Kodur@alsglobal.com

Respectfully submitted,

ALS Group USA Corp., dba ALS Environmental

Arthi Kodur
Project Manager

Page 1 of 584

For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com.

Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	Science and Engineering for the Environment, LLC	**Service Request No.:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Received:**	2/18/15
Sample Matrix:	PE		

ALS ENVIRONMENTAL NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

This report contains results for samples received by the laboratory under service request K1411748. All samples were received in accordance with the laboratory's sample acceptance policy. Please refer to the original service request for specific sample receipt information.

Analysis

Analysis of T_0 samples for PW01B & PW04B and re-run for PWW504 & PWP504, which are field duplicates made from PWW004B & PWP004B

Extraction/Re-extraction

The extraction technique performed on these samples followed the procedure outlined in the Guidance Document *Passive PE Sampling in Support of In Situ Remediation of Contaminated Sediments (Standard Operating Procedure for the Extraction and Analysis of Polyethylene Used In Polyethylene Devices)*, ESTCP Project ER-200915. December 2012.

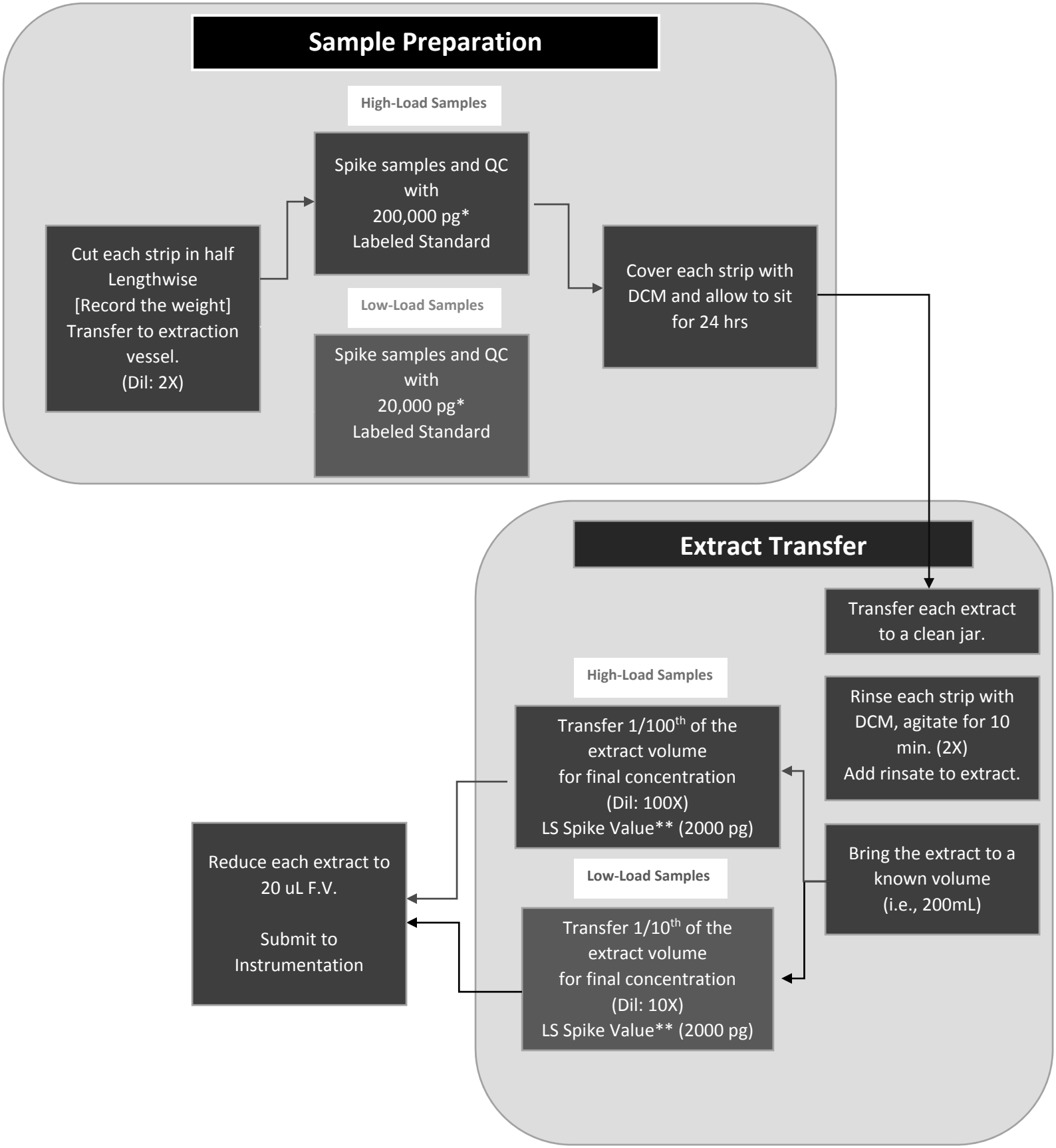
Each sample was submerged in methylene chloride, and spiked with isotopically labelled standards. The samples were allowed to stand in methylene chloride for a minimum of 12 hours. Each extract was quantitatively transferred to an 8-oz jar. Each sample strip was rinsed three more times with methylene chloride. Each rinsate was added to the initial extract. Prior to extract concentration, each extract was aliquoted to perform an effective dilution based on the expected concentration range of the pre-loaded PRC congeners. This aliquot is reflected in a factor adjustment of the sample amount used in the extract.

The amount of isotopically labelled standard added to each sample was adjusted to ensure that the spike amount in the final aliquot was 2000 pg, or 100 ng/mL. This spike amount is reflected in the Labeled Standard summaries in this report.

Each extract aliquot was also spiked with 2000 pg of the 1668 clean-up standard. While extract cleanup procedures were not required, this standard was added to demonstrate that the effective dilution factors were appropriately applied.

Details regarding the re-extraction of archived sample portions can be found in the table below.

The dilution approach used by the laboratory is outlined in the attached flowchart.



*Labeled standard concentration is presented in mass of each C13 Labeled Congener added to sample.

** LS Spike Value is presented in mass of each C13 Labeled congener present in final extract.

High-Load Sample Dilution: 200X
Low-Load Sample Dilution 20X

Data Validation Notes and Discussion

B flags – Method Blanks

The Method Blank EQ1500133-01 contained low levels of several congeners below the Method Reporting Limit (MRL).

The associated compounds in the samples are flagged with 'B' flags.

MS/MSD

EQ1500133 Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The batch quality control criteria were met.

Clean up Standard

The clean-up standard for 1668 was not added to the QC's for EQ1500133 and samples K1501568-002 through 004. However standard was added to K1501568-001. This was documented on the laboratory's preparation benchsheet.

E Flags

Sample K1501568-001(PW001B T0) was reported with an 'E' flag to denote that they had concentration greater than the high calibration point. The process of dilution is counter to the isotopic dilution technique that the laboratory uses to determine recovery and produces variability in the final value. The laboratory has demonstrated linearity of the curve above the highest calibration point and only dilutes when concentrations are greater than the demonstrated level or when detector saturation occurs.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

Manual Integrations

For this type of instrumentation and software, manual integration may be required frequently to correct inaccurate integrations performed by the processing software. These manual integrations are indicated in the raw data with a before and after chromatogram and are stamped with the reason for integration.

The TEQ Summary results for each sample have been calculated by ALS ENVIRONMENTAL/Houston to include:

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)

- Non-detected compounds are not included in the 'Total'

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: Science and Engineering for the Environment, LLC **Service Request:**K1 01 8
Project: RM11E Supplemental RI/FS Investigation

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
K1 01 8-001	PW001B T0	8/17/2014	1038
K1 01 8-002	PW004B T0	8/17/2014	1202
K1 01 8-003	RM11E-PWW 04	10/20/2014	130
K1 01 8-004	RM11E-PWP 04	10/20/2014	130

Service Request Summary

Folder #: **K1501568**
Client Name: Science and Engineering for the Environment, LLC
Pro ect Name: RM11E Supplemental RI/FS Investigation
Pro ect Number:

Report To: Tim Thompson
Science and Engineering for the Environment, LLC
4401 Latona Ave NE
Seattle, WA 810
SA
Phone Number: 20 -418- 173
Cell Number: 20 - 1 -410
Fa Number: 20 -418- 187
E-mail: tthompson seellc.com

Pro ect Chemist: eff Christian
Originating Lab: KELSO
Logged By: SWOLF
Date Received: 08/17/14 - 10/22/14
Internal Due Date: 2/2 /201
AP: LAB AP
ualifier Set: Lab Standard
Formset: Lab Standard
Merged :
Report to MDL :
P.O. Number:
EDD: Striplin GSI

4 8 o -Glass ar WM CLEAR Teflon Liner npreserved
Location: EHRMS-WIC 8E, S BBED
Pressure Gas:

Lab Samp No.	Client Samp No	Matrix	Collected	Cl Biphen Cong/1 8C	HO ST ON
K1 01 8-001	PW001B T0	PE	08/17/14 1038	**IV**	
K1 01 8-002	PW004B T0	PE	08/17/14 1202	**IV**	
K1 01 8-003	RM11E-PWW 04	PE	10/20/14 130	**IV**	
K1 01 8-004	RM11E-PWP 04	PE	10/20/14 130	**IV**	

Folder Comments:

(1) Samples are re-issued from K140872 -002 and -008 and K1411748-013 & -014. (2) Do not process prior to getting instructions from .Christian/R.Pierrot.

Service Request Summary

Folder #:	**K1501568**	Pro ect Chemist:	eff Christian
Client Name:	Science and Engineering for the Environment, LLC	Originating Lab:	KELSO
Pro ect Name:	RM11E Supplemental RI/FS Investigation	Logged By:	SWOLF
Pro ect Number:		Date Received:	08/17/14 - 10/22/14
		Internal Due Date:	2/2 /201
Report To:	Tim Thompson Science and Engineering for the Environment, LLC 4401 Latona Ave NE Seattle, WA 810 SA	AP:	LAB AP
		ualifier Set:	Lab Standard
		Formset:	Lab Standard
		Merged :	
Phone Number:	20 -418- 173	Report to MDL :	
Cell Number:	20 - 1 -410	P.O. Number:	
Fa Number:	20 -418- 187	EDD:	Striplin GSI
E-mail:	tthompson seellc.com		

4 8 o -Glass ar WM CLEAR Teflon Liner npreserved

Location: EHRMS-WIC 8E, S BBED

Pressure Gas:

Test Comments:

Group	Test/Method		Samples	Comments
Semivoa GCMS	Cl Biphen Cong/1	8C	1	(1) Low PRC load. (2) Report PRCs only. (3) se 1/2 sample and archive the remainder.
Semivoa GCMS	Cl Biphen Cong/1	8C	3	(1) High PRC load. (2) Report PRCs only. (3) se 1/2 sample and archive the remainder.

Printed 2/2 /201 :02: 1 PM

Superset Summary

Service Request: K1 01 8 **SuperSet Reference:** 1 -0000322 22 rev 00

Analytical Method: **1668C**

Calibrations: 02/17/1

Data Files:

Raw Data	Begin CCAL	Method Blan	Lab ID
U239137	23 134	23 137	E 1 00133-01
U239135	23 134	23 137	E 1 00133-02
U239136	23 134	23 137	E 1 00133-03
U239141	23 134	23 137	K1 01 8-001
U239138	23 134	23 137	K1 01 8-002
U239139	23 134	23 137	K1 01 8-003
U239140	23 134	23 137	K1 01 8-004

Data Qualifiers

HRMS Qualifier Set

B Indicates the associated analyte was found in the method blank at >1/10th the reported value.

E Estimated value. The reported concentration is above the calibration range of the instrument.

H Sample extracted and/or analyzed out of suggested holding time.

J Estimated value. The reported concentration is below the MRL.

K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. Reported concentration is a conservative estimate, however EMPC correction was not applied.

P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.

Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.

S Signal saturated detector. Result reported from dilution.

U Compound was analyzed for, but was not detected (ND).

X See Case Narrative.

Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-nois ratios are greater than 10:1, making the recoveries acceptable.

i The MDL/MRL have been elevated due to a matrix interference.

Acronyms

Cal	Calibration
Conc	CONCentration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient

State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
American Association for Laboratory Accreditation	2897.01	11/30/2015
Arizona Department of Health Services	AZ0793	5/27/2015
Arkansas Department of Environmental Quality	14-038-0	6/16/2015
California Department of Health Services	2452	2/28/2015
Florida Department of Health	E87611	6/30/2015
Hawaii Department of Health	TX02694	6/30/2015
Illinois Environmental Protection Agency	200057	10/6/2015
Louisiana Department of Health and Hospitals	TX2694	6/30/2015
Maine Center for Disease Control and Prevention	2014019	6/5/2016
Maryland Department of the Environment	343	6/30/2015
Michigan Depratment of Environmental Quality	9971	6/30/2015
Minnesota Department of Health	TX02694	12/31/2015
Nebraska Department of Health and Human Services	NE-OS-25-13	6/30/2015
Nevada Department of Concervation and Natural Resources	TX014112013-2	7/31/2015
New Jersey Department of Environmental Protection	NLC140001	6/30/2015
New Mexico Environment Department	TX02694	6/30/2015
New York Department of Health	11707	4/1/2015
Oklahoma Department of Environmental Quality	2014-124	8/31/2015
Oregon Environmental Laboratory Accreditation Program	TX200002	3/24/2015
Pennsylvania Department of Environmental Protection	68-03441	6/30/2015
Tennessee Department of Environment and Concervation	04016	6/30/2015
Texas Commision on Environmental Quality	TX104704216-14-5	6/30/2015
United States Department of Agriculture	P330-14-00067	2/21/2017
Utah Department of Health Environmental Laboratory Certification	TX02694	7/31/2015
Washington Department of Health	c819	11/14/2015
West Virginia Department of Environmental Protection	347	6/30/2015

ALS ENVIRONMENTAL – Houston
Data Processing/Form Production and Peer Review Signatures

SR# Unique ID K1501568 DB-5 DB-5MSUI DB-225 SPB-Octyl

First Level - Data Processing - to be filled by person generating the forms

Date: 2/26/15 Analyst: cee Samples: 1-4

Second Level - Data Review – to be filled by person doing peer review

Date: 02/26/15 Analyst: [illegible] Samples: 001-004

PEER REVIEW PAGE.DOC

Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Intra-Network Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Jeff Christian

Project Name: RM11E Supplemental RI/FS Investigation
Project Number:
Project Manager: Tim Thompson
Company: Science and Engineering for the Environment, LLC

Lab Code	Client Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Date Received	Send To	Cl Biphen Cong 1668C
K1501568-001	PW001B T0	1	Sediment	8/17/14	1038	8/17/14	HOUSTON	IV
K1501568-002	PW004B T0	1	Sediment	8/17/14	1202	8/17/14	HOUSTON	IV

K1501568 5
Science and Engineering for the Environment, LLC
RM11E Supplemental RI/FS Investigation

Folder Comments:
Samples are re-issued from K1408725-002 and -008.

Special Instructions/Comments
Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.

001B = Hi Load PRC.
004B = Lo Load PRC.
Report PRCs only.

pH Checked _____

Turnaround Requirements
X RUSH (Surcharges Apply)
PLEASE CIRCLE WORK DAYS
1 2 3 4 5
___ STANDARD
Requested FAX Date: 2/28/15
Requested Report Date: ~~03/10/15~~

Report Requirements
___ I. Results Only
___ II. Results + QC Summaries
___ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
PQL/MDL/J Y
EDD Y

Invoice Information
PO# K1501568
Bill to

Relinquished By: 2/17/15 1110 Received By: 2/18/15 1045 Airbill Number:

Cooler Receipt Form

Project Chemist: AK

Client/Project: RM11E Supplemental RI/FS Investigation

Thermometer ID: SMa

Date/Time Received: 2/18/15 10:45 Initials: DL

Date/Time Logged in: 2/18/15 1245 Initials: JLM

1. Method of delivery: ( ) US Mail (✓) Fed Ex ( ) UPS ( ) DHL ( ) Courier ( ) Client
2. Samples received in: (✓) Cooler ( ) Box ( ) Envelope ( ) Other _____
3. Were custody seals on coolers? (✓) Yes ( ) No
   Were they intact? (✓) Yes ( ) No ( ) N/A
   Were they signed and dated? (✓) Yes ( ) No ( ) N/A
   If yes, how many and where? 1 FRONT
4. Packing Material: ( ) Inserts ( ) Baggies (✓) Bubble Wrap ( ) Gel Packs ( ) Wet Ice ( ) Sleeves ( ) Other _____
5. Foreign or Regulated Soil? ( ) Yes ( ) No Location of Sampling: _____

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
5478 9741 6430		2/18/15	10:50am	DL	4/4	✓

6. Were custody papers properly filled out (ink, signed, dated, etc)? (✓) Yes ( ) No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (✓) Yes ( ) No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (✓) Yes ( ) No
9. Were appropriate bottles/containers and volumes received for the requested tests? (✓) Yes ( ) No
10. Did sample labels and tags agree with custody documents? (✓) Yes ( ) No

Notes, Discrepancies, & Resolutions:

# of containers on COC:

# of containers received:

Service request Label: K1501568 5

Science and Engineering for the Environment, LLC
RM11E Supplemental RI/FS Investigation

Effective 10/04/2013

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
T: +1 713 266 1599
F: +1 713 266 1599
www.alsglobal.com

SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 229620 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/LMCCRINK **Prep Method:** Method **Prep Date/Time:** 2/19/15 04:40 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ1500133-01	MB		1668C/Cl Biphen Cong		Solid	24.300mg	
2	EQ1500133-02	LCS		1668C/Cl Biphen Cong		Solid	24.300mg	
3	EQ1500133-03	DLCS		1668C/Cl Biphen Cong		Solid	24.300mg	
4	K1501568-001	PW001B T0	.01	1668C/Cl Biphen Cong		PE	4.430mg	clear wet PE
5	K1501568-002	PW004B T0	.01	1668C/Cl Biphen Cong		PE	38.600mg	clear wet PE
6	K1501568-003	RM11E-PWW504	.01	1668C/Cl Biphen Cong		PE	4.900mg	brown PE
7	K1501568-004	RM11E-PWP504	.01	1668C/Cl Biphen Cong		PE	9.300mg	clear PE

Spiking Solutions

Name: 1668A Matrix Stock Solution Inventory ID 77715 Logbook Ref: 77715 100-200ng/mL LM 1/2/15 Expires On: 01/21/2021

EQ1500133-02 20.00µL EQ1500133-03 20.00µL

Name: 1668A Labeled Toxics/LOC/Window-Defining Solution Inventory ID 78158 Logbook Ref: 1-2 ug/mL 78158 TL 1/19/15 Expires On: 07/27/2022

K1501568-001 1.00µL

Name: 1668A Labeled Toxics/LOC/Window-Defining Solution Inventory ID 78159 Logbook Ref: 1-2 ug/mL 78159 TL 1/19/15 Expires On: 07/27/2022

K1501568-001 1.00µL

Name: 1668A Clean Up Working Standard Inventory ID 78247 Logbook Ref: 78247 20ng/mL LM 1/22/15 Expires On: 01/22/2016

K1501568-001 100.00µL

Name: 1668A Labeled Stock Standard Inventory ID 78849 Logbook Ref: 78849 100-200ng/mL LM 2/18/15 Expires On: 02/18/2020

EQ1500133-01 20.00µL EQ1500133-02 20.00µL EQ1500133-03 20.00µL K1501568-002 20.00µL K1501568-003 20.00µL K1501568-004 20.00µL

Preparation Materials

Dichloromethane (Methylene Chloride) 99.9% MeCl2 AL 02/15/13 (54777)

Preparation Information Benchsheet

Prep Run#: 229620 **Prep WorkFlow:** OrgExtS(365) **Status:** Prepped
Team: Semivoa GCMS/LMCCRINK **Prep Method:** Method **Prep Date/Time:** 2/19/15 04:40 PM

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	2/19/15 16:40	Started:	2/20/15 18:00	Started:	2/20/15 18:00	Started:	2/23/15 17:10
Finished:	2/20/15 06:00	Finished:	2/20/15 18:00	Finished:	2/20/15 18:00	Finished:	2/23/15 19:30
By:	LMCCRINK	By:	LMCCRINK	By:	LMCCRINK	By:	LMCCRINK
Comments		Comments		Comments		Comments	

Comments: _____

Reviewed By: _____ Date: _____

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 10:38
Sample Matrix:	PE	**Date Received:**	08/17/14 13:44
Sample Name:	PW001B T0	**Units:**	ng/Kg
Lab Code:	K1501568-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 20:33
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.430mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239141	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	19900000		4100	11300	1.03	0.861	1
PCBs 44 + 47 + 65	15200000		888	22600	0.77	1.038	1
PCB 54	23200000	**E**	284	4510	0.77	1.001	1
PCB 111	22900000		321	11300	1.57	1.078	1
PCBs 153 + 168	20200000		243	22600	1.22	0.970	1
PCB 178	17800000		227	11300	1.05	1.079	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	18300000		385	45100	1.55	1.034	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 10:38
Sample Matrix:	PE	**Date Received:**	08/17/14 13:44
Sample Name:	PW001B T0	**Units:**	Percent
Lab Code:	K1501568-001	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 20:33
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.430mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239141	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1716.506	86		5-145	1.06	1.082
PCB 19L	2000	1484.845	74		5-145	1.08	1.067
PCB 81L	2000	1835.821	92		10-145	0.78	1.332
PCB 77L	2000	1871.746	94		10-145	0.78	1.353
PCB 54L	2000	1282.440	64		5-145	0.80	0.832
PCB 104L	2000	1343.341	67		10-145	1.59	0.826
PCB 118L	2000	1873.300	94		10-145	1.56	1.146
PCB 105L	2000	1935.214	97		10-145	1.57	1.182
PCB 126L	2000	2049.106	102		10-145	1.58	1.273
PCB 114L	2000	1883.699	94		10-145	1.60	1.162
PCB 123L	2000	1852.697	93		10-145	1.54	1.137
PCB 155L	2000	1341.072	67		10-145	1.24	0.800
PCBs 156L + 157L	4000	3792.212	95		10-145	1.26	1.099
PCB 169L	2000	2040.118	102		10-145	1.26	1.177
PCB 167L	2000	1868.442	93		10-145	1.26	1.071
PCB 189L	2000	1797.894	90		10-145	1.05	0.960
PCB 188L	2000	1107.599	55		10-145	1.06	0.726

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:02
Sample Matrix:	PE	**Date Received:**	08/17/14 13:44
Sample Name:	PW004B T0	**Units:**	ng/Kg
Lab Code:	K1501568-002	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 17:20
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	38.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239138	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 20 + 28	655000		135	1300	1.02	0.862	1
PCBs 44 + 47 + 65	536000		53.2	2590	0.77	1.039	1
PCB 54	782000		32.4	518	0.76	1.001	1
PCB 111	794000		39.6	1300	1.54	1.079	1
PCBs 153 + 168	795000		21.5	2590	1.23	0.970	1
PCB 178	759000		22.1	1300	1.05	1.079	1
PCBs 86 + 87 + 97 + 109 + 119 + 125	621000		47.4	5180	1.54	1.034	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	08/17/14 12:02
Sample Matrix:	PE	**Date Received:**	08/17/14 13:44
Sample Name:	PW004B T0	**Units:**	Percent
Lab Code:	K1501568-002	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 17:20
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	38.600mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239138	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 37L	2000	1819.721	91		5-145	1.06	1.082
PCB 19L	2000	1581.431	79		5-145	1.09	1.068
PCB 81L	2000	1794.488	90		10-145	0.79	1.331
PCB 77L	2000	1797.293	90		10-145	0.79	1.353
PCB 54L	2000	1301.985	65		5-145	0.79	0.832
PCB 104L	2000	1410.384	71		10-145	1.60	0.826
PCB 118L	2000	1873.219	94		10-145	1.58	1.147
PCB 105L	2000	1891.641	95		10-145	1.55	1.183
PCB 126L	2000	1943.443	97		10-145	1.60	1.274
PCB 114L	2000	1856.502	93		10-145	1.56	1.163
PCB 123L	2000	1869.890	93		10-145	1.56	1.137
PCB 155L	2000	1412.463	71		10-145	1.31	0.800
PCBs 156L + 157L	4000	3687.968	92		10-145	1.25	1.099
PCB 169L	2000	1938.082	97		10-145	1.28	1.177
PCB 167L	2000	1815.980	91		10-145	1.27	1.071
PCB 189L	2000	1786.694	89		10-145	1.03	0.960
PCB 188L	2000	1191.080	60		10-145	1.07	0.726

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	566	4080			1
PCB 2	ND	U	600	4080			1
PCB 3	ND	U	579	4080			1
PCBs 85 + 116 + 117	ND	U	420	20400			1
PCB 4	2270**J**		359	4080	-	1.001	1
PCB 10	ND	U	222	10200	-		1
PCB 9	ND	U	278	4080	-		1
PCB 7	ND	U	262	4080	-		1
PCB 6	ND	U	281	4080	-		1
PCB 5	ND	U	287	4080	-		1
PCB 8	ND	U	268	10200	-		1
PCB 14	ND	U	281	4080	-		1
PCB 11	1040**J**		270	20400	-	0.972	1
PCBs 12 + 13	ND	U	267	10200	-		1
PCB 15	ND	U	270	4080	-		1
PCB 19	9310		1210	4080	1.01	1.001	1
PCBs 18 + 30	ND	U	981	10200			1
PCB 17	4650		1180	4080	1.16	1.121	1
PCB 27	ND	U	837	4080			1
PCB 24	ND	U	833	4080			1
PCB 16	ND	U	1400	4080			1
PCB 32	2180**J**		791	4080	1.01	1.173	1
PCB 34	ND	U	1050	4080			1
PCB 23	ND	U	1020	4080			1
PCBs 26 + 29	ND	U	1020	10200			1
PCB 25	ND	U	750	4080			1
PCB 31	ND	U	949	10200			1
PCBs 20 + 28	10900		970	10200	0.91	0.862	1
PCBs 21 + 33	ND	U	905	10200			1
PCB 22	ND	U	972	4080			1
PCB 36	ND	U	906	4080			1
PCB 39	ND	U	880	4080			1
PCB 38	ND	U	1030	4080			1
PCB 35	ND	U	1030	4080			1
PCB 37	ND	U	1080	4080			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 54	9290		327	4080	0.76	1.001	1
PCBs 50 + 53	14900**J**		315	20400	0.77	0.912	1
PCBs 45 + 51	17400		330	10200	0.74	0.940	1
PCB 46	ND	U	385	4080			1
PCB 52	20200		306	10200	0.80	1.001	1
PCBs 43 + 73	1480**J**		279	10200	0.85	1.005	1
PCBs 49 + 69	18900**J**		237	20400	0.73	1.018	1
PCB 48	432**JK**		289	10200	0.52	1.029	1
PCBs 44 + 47 + 65	90700		262	20400	0.75	1.038	1
PCBs 59 + 62 + 75	1790**J**		235	20400	0.86	1.049	1
PCB 42	958**J**		261	20400	0.81	1.058	1
PCB 41	ND	U	364	20400			1
PCBs 40 + 71	3950**J**		285	20400	0.80	1.077	1
PCB 64	899**J**		180	10200	0.65	1.085	1
PCB 72	ND	U	230	10200			1
PCB 68	716**J**		206	10200	0.70	1.123	1
PCB 57	ND	U	242	10200			1
PCB 58	ND	U	217	10200			1
PCB 67	ND	U	221	10200			1
PCB 63	ND	U	233	10200			1
PCB 61	ND	U	230	40800			1
PCBs 70 + 74 + 76	3690**J**		201	40800	0.83	1.178	1
PCB 66	2520**JK**		226	10200	0.56	1.190	1
PCB 55	ND	U	223	10200			1
PCB 56	ND	U	621	10200			1
PCB 60	ND	U	602	10200			1
PCB 80	ND	U	557	10200			1
PCB 79	6190**J**		553	10200	0.75	0.973	1
PCB 78	ND	U	632	10200			1
PCB 81	ND	U	661	4080			1
PCB 77	6400**K**		688	4080	0.98	0.999	1
PCB 104	1080**JK**		504	4080	2.39	1.001	1
PCB 96	1980**JK**		452	10200	0.98	1.017	1
PCB 103	4710**J**		519	10200	1.41	1.082	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 94	2860**JK**		563	10200	1.24	1.091	1
PCB 95	58000		1100	40800	1.48	1.108	1
PCBs 93 + 100	8710**J**		558	40800	1.53	1.113	1
PCBs 98 + 102	2100**JK**		479	40800	1.23	1.120	1
PCB 88	ND	U	609	10200			1
PCB 91	11000		504	10200	1.58	1.139	1
PCB 84	2270**JK**		646	4080	1.25	1.149	1
PCB 89	ND	U	616	10200			1
PCB 121	ND	U	363	10200			1
PCB 92	6190**J**		545	10200	1.68	0.984	1
PCBs 90 + 101 + 113	31500**J**		453	40800	1.46	1.000	1
PCBs 83 + 99	9360**J**		493	20400	1.41	1.017	1
PCB 112	ND	U	400	10200			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	245000		427	40800	1.53	1.034	1
PCBs 110 + 115	13300**J**		334	20400	1.41	1.060	1
PCB 82	ND	U	592	10200			1
PCB 111	711000		356	10200	1.57	1.079	1
PCB 120	ND	U	362	10200			1
PCBs 108 + 124	ND	U	417	20400			1
PCB 107	724**JK**		399	10200	1.26	0.997	1
PCB 123	ND	U	415	4080			1
PCB 106	ND	U	436	10200			1
PCB 118	5650		395	4080	1.62	1.001	1
PCB 122	ND	U	458	10200			1
PCB 114	ND	U	418	4080			1
PCB 105	1980**J**		435	4080	1.75	1.001	1
PCB 127	ND	U	413	10200			1
PCB 126	ND	U	422	4080			1
PCB 155	ND	U	108	4080			1
PCB 152	515**JK**		106	10200	1.03	1.009	1
PCB 150	1110**JK**		98.0	10200	1.04	1.014	1
PCB 136	11100		108	10200	1.29	1.026	1
PCB 145	ND	U	102	10200			1
PCB 148	597**JK**		138	10200	0.49	1.076	1
PCBs 135 + 151	27100		141	20400	1.28	1.096	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 154	1310**JK**		144	20400	1.82	1.101	1
PCB 144	5140**J**		245	10200	1.05	1.112	1
PCBs 147 + 149	40600		393	20400	1.27	0.899	1
PCB 134	ND	U	360	20400			1
PCB 143	ND	U	482	20400			1
PCBs 139 + 140	ND	U	393	20400			1
PCB 131	ND	U	361	10200			1
PCB 142	ND	U	464	10200			1
PCB 132	10400		430	10200	1.35	0.930	1
PCB 133	ND	U	446	10200			1
PCB 165	ND	U	316	10200			1
PCB 146	7070**J**		376	10200	1.18	0.955	1
PCB 161	ND	U	318	10200			1
PCBs 153 + 168	978000		314	20400	1.24	0.970	1
PCB 141	8000**J**		408	10200	1.23	0.976	1
PCB 130	ND	U	466	10200			1
PCB 137	ND	U	389	10200			1
PCB 164	ND	U	318	10200			1
PCBs 129 + 138 + 163	34100**J**		401	40800	1.23	1.000	1
PCB 160	ND	U	216	40800			1
PCB 158	35600		291	10200	1.16	1.010	1
PCBs 128 + 166	ND	U	352	20400			1
PCB 159	ND	U	332	10200			1
PCB 162	ND	U	306	10200			1
PCB 167	686**JK**		264	4080	0.85	1.000	1
PCBs 156 + 157	1470**JK**		462	8160	1.04	0.999	1
PCB 169	ND	U	268	4080			1
PCB 188	ND	U	232	4080			1
PCB 179	5140**JK**		191	10200	1.30	1.011	1
PCB 184	ND	U	170	10200			1
PCB 176	ND	U	195	10200			1
PCB 186	ND	U	180	10200			1
PCB 178	1060000		260	10200	1.04	1.079	1
PCB 175	1860**JK**		239	10200	0.88	1.095	1
PCB 187	11400		212	10200	1.16	1.102	1
PCB 182	ND	U	237	10200			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 183	5670**J**		288	20400	1.07	1.117	1
PCB 185	897**J**		305	20400	1.15	1.121	1
PCB 174	8840**J**		308	10200	1.09	1.125	1
PCB 177	5670**JK**		326	10200	1.22	1.136	1
PCB 181	ND	U	289	10200			1
PCBs 171 + 173	2080**J**		337	20400	0.94	1.153	1
PCB 172	1220**JK**		335	10200	1.39	0.903	1
PCB 192	ND	U	243	10200			1
PCBs 180 + 193	13300**J**		233	20400	1.00	0.915	1
PCB 191	348**JK**		240	10200	0.41	0.922	1
PCB 170	6330**J**		330	10200	1.01	0.940	1
PCB 190	1240**J**		227	10200	0.98	0.951	1
PCB 189	ND	U	222	4080			1
PCB 202	897**BJK**		157	4080	0.57	1.000	1
PCB 201	250**JK**		153	10200	0.45	1.021	1
PCB 204	ND	U	154	10200			1
PCB 197	ND	U	139	20400			1
PCB 200	311**JK**		153	20400	0.44	1.045	1
PCBs 198 + 199	2400**J**		197	20400	0.89	1.108	1
PCB 196	1160**JK**		201	10200	0.54	0.919	1
PCB 203	1010**J**		173	10200	0.96	0.922	1
PCB 195	762**JK**		218	10200	0.66	0.948	1
PCB 194	1840**JK**		198	10200	1.23	0.992	1
PCB 205	227**J**		182	4080	0.85	1.000	1
PCB 208	ND	U	547	4080			1
PCB 207	ND	U	571	10200			1
PCB 206	ND	U	1490	4080			1
PCB 209	ND	U	272	4080			1
Total MonoCB	ND	U	566	10200			1
Total DiCB	3310**J**		222	20400			1
Total TriCB	27000		750	10200			1
Total TetraCB	200000		180	40800			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total PentaCB	1120000		334	40800			1
Total HexaCB	1160000		98.0	40800			1
Total HeptaCB	1120000		170	20400			1
Total OctaCB	8870**J**		139	20400			1
Total NonaCB	ND	U	547	10200			1
Total PCBs	3640000		98.0	40800			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	Percent
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 18:24
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	4.900mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239139	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1574.063	79		5-145	3.03	0.745
PCB 3L	2000	1651.796	83		5-145	3.06	0.873
PCB 4L	2000	1416.604	71		5-145	1.58	0.888
PCB 15L	2000	1701.892	85		5-145	1.58	1.225
PCB 19L	2000	1504.461	75		5-145	1.07	1.068
PCB 37L	2000	1750.650	88		5-145	1.06	1.082
PCB 54L	2000	1290.424	65		5-145	0.79	0.832
PCB 81L	2000	1865.752	93		10-145	0.78	1.330
PCB 77L	2000	1822.490	91		10-145	0.79	1.352
PCB 104L	2000	1380.790	69		10-145	1.56	0.826
PCB 123L	2000	1895.955	95		10-145	1.53	1.137
PCB 118L	2000	1906.059	95		10-145	1.58	1.146
PCB 114L	2000	1905.078	95		10-145	1.62	1.162
PCB 105L	2000	1907.190	95		10-145	1.59	1.183
PCB 126L	2000	2048.058	102		10-145	1.62	1.273
PCB 155L	2000	1335.194	67		10-145	1.31	0.800
PCB 167L	2000	1791.305	90		10-145	1.28	1.071
PCBs 156L + 157L	4000	3624.851	91		10-145	1.28	1.100
PCB 169L	2000	1996.168	100		10-145	1.23	1.177
PCB 188L	2000	1097.710	55		10-145	1.04	0.726
PCB 189L	2000	1750.918	88		10-145	1.03	0.960
PCB 202L	2000	1294.934	65		10-145	0.88	0.826
PCB 205L	2000	1850.681	93		10-145	0.92	1.009
PCB 208L	2000	1286.182	64		10-145	0.80	0.950
PCB 209L	2000	2481.651	124		10-145	1.23	1.073
PCB 28L		0			5-145		
PCB 111L		0			10-145		
PCB 178L		0			10-145		

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWW504	**Units:**	ng/Kg
Lab Code:	K1501568-003	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	661	4080	1	0.0003	
PCB 77	**6400**	688	4080	1	0.0001	0.640
PCB 123	ND	415	4080	1	0.00003	
PCB 118	**5650**	395	4080	1	0.00003	0.170
PCB 114	ND	418	4080	1	0.00003	
PCB 105	**1980**	435	4080	1	0.00003	0.0594
PCB 126	ND	422	4080	1	0.1	
PCB 167	**686**	264	4080	1	0.00003	0.0206
PCBs 156 + 157	**1470**	462	8160	1	0.00003	0.0441
PCB 169	ND	268	4080	1	0.03	
PCB 189	ND	222	4080	1	0.00003	
	Total TEQ					0.934

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	3310		206	2150	2.98	1.001	1
PCB 2	ND	U	224	2150			1
PCB 3	ND	U	222	2150			1
PCBs 85 + 116 + 117	3390**JK**		222	10800	0.81	1.052	1
PCB 4	394000		103	2150	-	1.001	1
PCB 10	14000		65.1	5380	-	1.012	1
PCB 9	1090**J**		89.8	2150	-	1.128	1
PCB 7	1060**J**		84.7	2150	-	1.139	1
PCB 6	2920		90.7	2150	-	1.155	1
PCB 5	ND	U	92.7	2150	-		1
PCB 8	11100		86.4	5380	-	1.184	1
PCB 14	ND	U	90.6	2150	-		1
PCB 11	957**BJ**		87.0	10800	-	0.972	1
PCBs 12 + 13	916**J**		86.3	5380	-	0.987	1
PCB 15	5780		89.0	2150	-	1.001	1
PCB 19	653000		444	2150	1.04	1.001	1
PCBs 18 + 30	20900		368	5380	1.05	1.100	1
PCB 17	137000		441	2150	1.05	1.120	1
PCB 27	39600		314	2150	1.03	1.133	1
PCB 24	ND	U	313	2150			1
PCB 16	1820**J**		523	2150	0.98	1.146	1
PCB 32	62400		297	2150	1.02	1.173	1
PCB 34	ND	U	384	2150			1
PCB 23	ND	U	373	2150			1
PCBs 26 + 29	4430**J**		375	5380	1.05	1.262	1
PCB 25	7780		276	2150	1.02	0.843	1
PCB 31	10300		350	5380	1.06	0.852	1
PCBs 20 + 28	437000		357	5380	1.03	0.861	1
PCBs 21 + 33	6000		334	5380	1.15	0.869	1
PCB 22	921**JK**		358	2150	0.80	0.885	1
PCB 36	ND	U	334	2150			1
PCB 39	ND	U	324	2150			1
PCB 38	ND	U	376	2150			1
PCB 35	ND	U	378	2150			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 37	ND	U	403	2150			1
PCB 54	451000		114	2150	0.76	1.001	1
PCBs 50 + 53	225000		146	10800	0.76	0.913	1
PCBs 45 + 51	231000		153	5380	0.77	0.940	1
PCB 46	9590		179	2150	0.75	0.951	1
PCB 52	177000		142	5380	0.75	1.001	1
PCBs 43 + 73	ND	U	130	5380			1
PCBs 49 + 69	153000		110	10800	0.77	1.019	1
PCB 48	1870**J**		134	5380	0.71	1.029	1
PCBs 44 + 47 + 65	710000		121	10800	0.77	1.039	1
PCBs 59 + 62 + 75	9630**J**		109	10800	0.80	1.050	1
PCB 42	5580**J**		121	10800	0.79	1.059	1
PCB 41	ND	U	168	10800			1
PCBs 40 + 71	32200		132	10800	0.79	1.077	1
PCB 64	3590**J**		83.3	5380	0.83	1.085	1
PCB 72	ND	U	107	5380			1
PCB 68	1920**J**		95.2	5380	0.80	1.124	1
PCB 57	ND	U	112	5380			1
PCB 58	508**JK**		101	5380	0.60	1.151	1
PCB 67	ND	U	103	5380			1
PCB 63	ND	U	108	5380			1
PCB 61	ND	U	107	21500			1
PCBs 70 + 74 + 76	12700**J**		93.1	21500	0.77	1.179	1
PCB 66	9090		105	5380	0.73	1.190	1
PCB 55	ND	U	103	5380			1
PCB 56	1240**J**		208	5380	0.65	0.914	1
PCB 60	376**J**		202	5380	0.81	0.920	1
PCB 80	561**J**		187	5380	0.72	0.925	1
PCB 79	13000		185	5380	0.77	0.973	1
PCB 78	ND	U	212	5380			1
PCB 81	ND	U	226	2150			1
PCB 77	6500		232	2150	0.76	0.999	1
PCB 104	5780		206	2150	1.56	1.001	1
PCB 96	14700		181	5380	1.67	1.017	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 103	21800		208	5380	1.52	1.082	1
PCB 94	10700		226	5380	1.63	1.092	1
PCB 95	380000		438	21500	1.60	1.108	1
PCBs 93 + 100	31400		224	21500	1.55	1.112	1
PCBs 98 + 102	10800**J**		192	21500	1.58	1.120	1
PCB 88	ND	U	244	5380			1
PCB 91	62300		202	5380	1.60	1.139	1
PCB 84	14500		259	2150	1.53	1.148	1
PCB 89	ND	U	247	5380			1
PCB 121	ND	U	192	5380			1
PCB 92	25600		287	5380	1.52	0.984	1
PCBs 90 + 101 + 113	141000		239	21500	1.54	1.000	1
PCBs 83 + 99	41000		260	10800	1.48	1.018	1
PCB 112	ND	U	211	5380			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	562000		225	21500	1.53	1.034	1
PCBs 110 + 115	53400		177	10800	1.55	1.060	1
PCB 82	ND	U	313	5380			1
PCB 111	685000		188	5380	1.54	1.079	1
PCB 120	ND	U	191	5380			1
PCBs 108 + 124	ND	U	437	10800			1
PCB 107	1900**J**		417	5380	1.63	0.997	1
PCB 123	ND	U	440	2150			1
PCB 106	ND	U	457	5380			1
PCB 118	15600		411	2150	1.61	1.001	1
PCB 122	ND	U	480	5380			1
PCB 114	ND	U	427	2150			1
PCB 105	3740		438	2150	1.60	1.000	1
PCB 127	ND	U	432	5380			1
PCB 126	ND	U	421	2150			1
PCB 155	506**JK**		91.4	2150	1.51	1.000	1
PCB 152	2020**J**		81.4	5380	1.11	1.009	1
PCB 150	3920**J**		75.4	5380	1.39	1.014	1
PCB 136	47100		82.6	5380	1.24	1.026	1
PCB 145	ND	U	78.0	5380			1
PCB 148	2410**J**		107	5380	1.34	1.077	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 135 + 151	99100		108	10800	1.25	1.096	1
PCB 154	9250**J**		110	10800	1.33	1.102	1
PCB 144	17500		188	5380	1.23	1.112	1
PCBs 147 + 149	133000		251	10800	1.25	0.899	1
PCB 134	5240**J**		231	10800	1.11	0.904	1
PCB 143	ND	U	308	10800			1
PCBs 139 + 140	ND	U	251	10800			1
PCB 131	ND	U	231	5380			1
PCB 142	ND	U	297	5380			1
PCB 132	36700		275	5380	1.18	0.930	1
PCB 133	5090**J**		285	5380	1.28	0.940	1
PCB 165	ND	U	202	5380			1
PCB 146	27400		240	5380	1.23	0.955	1
PCB 161	ND	U	204	5380			1
PCBs 153 + 168	751000		201	10800	1.23	0.970	1
PCB 141	26500		261	5380	1.27	0.975	1
PCB 130	3840**J**		298	5380	1.12	0.985	1
PCB 137	ND	U	249	5380			1
PCB 164	7950		204	5380	1.21	0.993	1
PCBs 129 + 138 + 163	117000		256	21500	1.23	1.000	1
PCB 160	ND	U	138	21500			1
PCB 158	24700		186	5380	1.21	1.010	1
PCBs 128 + 166	5390**J**		225	10800	1.12	1.032	1
PCB 159	1280**J**		238	5380	1.28	0.984	1
PCB 162	654**JK**		219	5380	1.83	0.993	1
PCB 167	1730**JK**		185	2150	1.55	1.000	1
PCBs 156 + 157	4150**J**		315	4300	1.31	1.000	1
PCB 169	ND	U	189	2150			1
PCB 188	ND	U	80.4	2150			1
PCB 179	23400		62.1	5380	1.03	1.012	1
PCB 184	ND	U	55.4	5380			1
PCB 176	5230**J**		63.6	5380	1.03	1.033	1
PCB 186	ND	U	58.7	5380			1
PCB 178	583000		84.9	5380	1.05	1.079	1
PCB 175	2010**J**		77.9	5380	0.99	1.095	1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 187	49200		69.1	5380	1.02	1.102	1
PCB 182	ND	U	77.1	5380			1
PCB 183	15800		191	10800	1.02	1.118	1
PCB 185	3690**J**		202	10800	1.12	1.121	1
PCB 174	36100		204	5380	1.02	1.125	1
PCB 177	21600		216	5380	1.01	1.136	1
PCB 181	ND	U	192	5380			1
PCBs 171 + 173	9650**J**		224	10800	0.99	1.152	1
PCB 172	5340**J**		222	5380	1.03	0.902	1
PCB 192	ND	U	161	5380			1
PCBs 180 + 193	57100		155	10800	1.03	0.915	1
PCB 191	1160**J**		159	5380	0.90	0.922	1
PCB 170	26400		219	5380	1.03	0.940	1
PCB 190	5330**J**		150	5380	0.97	0.950	1
PCB 189	ND	U	136	2150			1
PCB 202	2280		76.0	2150	0.84	1.000	1
PCB 201	1370**J**		71.3	5380	0.90	1.021	1
PCB 204	ND	U	72.1	5380			1
PCB 197	435**JK**		65.2	10800	1.15	1.041	1
PCB 200	1450**J**		71.3	10800	0.87	1.045	1
PCBs 198 + 199	9250**J**		92.4	10800	0.92	1.108	1
PCB 196	4520**J**		94.2	5380	0.82	0.919	1
PCB 203	5080**J**		80.9	5380	0.86	0.923	1
PCB 195	3620**J**		102	5380	0.98	0.948	1
PCB 194	7510		92.5	5380	0.92	0.992	1
PCB 205	520**J**		82.3	2150	0.92	1.001	1
PCB 208	233**J**		180	2150	0.88	1.000	1
PCB 207	ND	U	188	5380			1
PCB 206	863**J**		573	2150	0.87	1.001	1
PCB 209	ND	U	92.8	2150			1
Total MonoCB	3310**J**		206	5380			1
Total DiCB	431000		65.1	10800			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total TriCB	1380000		276	5380			1
Total TetraCB	2060000		83.3	21500			1
Total PentaCB	2080000		177	21500			1
Total HexaCB	1330000		75.4	21500			1
Total HeptaCB	845000		55.4	10800			1
Total OctaCB	36000		65.2	10800			1
Total NonaCB	1100	**J**	180	5380			1
Total PCBs	8170000		55.4	21500			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	Percent
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 19:29
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	9.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239140	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1605.439	80		5-145	3.02	0.744
PCB 3L	2000	1700.252	85		5-145	3.12	0.872
PCB 4L	2000	1474.654	74		5-145	1.59	0.887
PCB 15L	2000	1729.179	86		5-145	1.60	1.224
PCB 19L	2000	1520.548	76		5-145	1.08	1.067
PCB 37L	2000	1813.814	91		5-145	1.04	1.082
PCB 54L	2000	1317.336	66		5-145	0.79	0.832
PCB 81L	2000	1873.131	94		10-145	0.78	1.332
PCB 77L	2000	1853.812	93		10-145	0.79	1.353
PCB 104L	2000	1364.247	68		10-145	1.60	0.826
PCB 123L	2000	1829.862	91		10-145	1.57	1.137
PCB 118L	2000	1849.222	92		10-145	1.59	1.146
PCB 114L	2000	1859.984	93		10-145	1.56	1.162
PCB 105L	2000	1893.000	95		10-145	1.58	1.183
PCB 126L	2000	2004.589	100		10-145	1.58	1.273
PCB 155L	2000	1386.718	69		10-145	1.25	0.800
PCB 167L	2000	1833.903	92		10-145	1.29	1.071
PCBs 156L + 157L	4000	3744.991	94		10-145	1.24	1.099
PCB 169L	2000	2011.108	101		10-145	1.26	1.177
PCB 188L	2000	1067.318	53		10-145	1.07	0.726
PCB 189L	2000	1720.047	86		10-145	1.04	0.960
PCB 202L	2000	1269.787	63		10-145	0.92	0.826
PCB 205L	2000	1850.894	93		10-145	0.91	1.009
PCB 208L	2000	1256.685	63		10-145	0.79	0.950
PCB 209L	2000	2447.669	122		10-145	1.23	1.073
PCB 28L		0			5-145		
PCB 111L		0			10-145		
PCB 178L		0			10-145		

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	10/20/14 13:05
Sample Matrix:	PE	**Date Received:**	10/22/14 08:00
Sample Name:	RM11E-PWP504	**Units:**	ng/Kg
Lab Code:	K1501568-004	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method: 1668C

Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
PCB 81	ND	226	2150	1	0.0003	
PCB 77	**6500**	232	2150	1	0.0001	0.650
PCB 123	ND	440	2150	1	0.00003	
PCB 118	**15600**	411	2150	1	0.00003	0.468
PCB 114	ND	427	2150	1	0.00003	
PCB 105	**3740**	438	2150	1	0.00003	0.112
PCB 126	ND	421	2150	1	0.1	
PCB 167	**1730**	185	2150	1	0.00003	0.0519
PCBs 156 + 157	**4150**	315	4300	1	0.00003	0.125
PCB 169	ND	189	2150	1	0.03	
PCB 189	ND	136	2150	1	0.00003	
		Total TEQ				1.41

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	ND	U	35.5	823			1
PCB 2	ND	U	39.6	823			1
PCB 3	ND	U	40.0	823			1
PCBs 85 + 116 + 117	ND	U	83.5	4120			1
PCB 4	ND	U	27.0	823	-		1
PCB 10	ND	U	17.1	2060	-		1
PCB 9	ND	U	19.3	823	-		1
PCB 7	ND	U	18.2	823	-		1
PCB 6	ND	U	19.5	823	-		1
PCB 5	ND	U	19.9	823	-		1
PCB 8	ND	U	18.6	2060	-		1
PCB 14	ND	U	19.5	823	-		1
PCB 11	104**J**		18.7	4120	-	0.971	1
PCBs 12 + 13	ND	U	18.6	2060	-		1
PCB 15	ND	U	19.1	823	-		1
PCB 19	ND	U	131	823			1
PCBs 18 + 30	ND	U	110	2060			1
PCB 17	ND	U	131	823			1
PCB 27	ND	U	93.2	823			1
PCB 24	ND	U	92.7	823			1
PCB 16	ND	U	156	823			1
PCB 32	ND	U	88.1	823			1
PCB 34	ND	U	97.8	823			1
PCB 23	ND	U	94.9	823			1
PCBs 26 + 29	ND	U	95.5	2060			1
PCB 25	ND	U	70.3	823			1
PCB 31	ND	U	89.0	2060			1
PCBs 21 + 33	ND	U	84.9	2060			1
PCB 22	ND	U	91.2	823			1
PCB 36	ND	U	84.9	823			1
PCB 39	ND	U	82.5	823			1
PCB 38	ND	U	95.8	823			1
PCB 35	ND	U	96.1	823			1
PCB 37	ND	U	103	823			1
PCBs 20 + 28	ND	U	91.0	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 50 + 53	ND	U	62.2	4120			1
PCBs 45 + 51	ND	U	65.2	2060			1
PCB 46	ND	U	76.1	823			1
PCB 52	ND	U	60.5	2060			1
PCBs 43 + 73	ND	U	55.2	2060			1
PCBs 49 + 69	ND	U	46.9	4120			1
PCB 48	ND	U	57.2	2060			1
PCBs 59 + 62 + 75	ND	U	46.4	4120			1
PCB 42	ND	U	51.5	4120			1
PCB 41	ND	U	71.8	4120			1
PCBs 40 + 71	ND	U	56.2	4120			1
PCB 64	ND	U	35.6	2060			1
PCB 72	ND	U	45.5	2060			1
PCB 68	ND	U	40.7	2060			1
PCB 57	ND	U	47.8	2060			1
PCB 58	ND	U	42.9	2060			1
PCB 67	ND	U	43.7	2060			1
PCB 63	ND	U	45.9	2060			1
PCB 61	ND	U	45.5	8230			1
PCBs 70 + 74 + 76	ND	U	39.8	8230			1
PCB 66	ND	U	44.6	2060			1
PCB 55	ND	U	44.0	2060			1
PCB 56	ND	U	57.4	2060			1
PCB 60	ND	U	55.6	2060			1
PCB 80	ND	U	51.5	2060			1
PCB 79	ND	U	51.1	2060			1
PCB 78	ND	U	58.4	2060			1
PCB 81	ND	U	62.6	823			1
PCB 77	ND	U	64.4	823			1
PCBs 44 + 47 + 65	ND	U	51.7	4120			1
PCB 54	ND	U	30.6	823			1
PCB 104	ND	U	81.5	823			1
PCB 96	ND	U	74.2	2060			1
PCB 103	ND	U	85.2	2060			1
PCB 94	ND	U	92.5	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 95	ND	U	180	8230			1
PCBs 93 + 100	ND	U	91.7	8230			1
PCBs 98 + 102	ND	U	78.7	8230			1
PCB 88	ND	U	100	2060			1
PCB 91	ND	U	82.8	2060			1
PCB 84	ND	U	107	823			1
PCB 89	ND	U	102	2060			1
PCB 121	ND	U	72.0	2060			1
PCB 92	ND	U	109	2060			1
PCBs 90 + 101 + 113	ND	U	89.8	8230			1
PCBs 83 + 99	ND	U	97.9	4120			1
PCB 112	ND	U	79.5	2060			1
PCBs 110 + 115	ND	U	66.4	4120			1
PCB 82	ND	U	118	2060			1
PCB 120	ND	U	71.8	2060			1
PCBs 108 + 124	ND	U	79.1	4120			1
PCB 107	ND	U	75.6	2060			1
PCB 123	ND	U	79.0	823			1
PCB 106	ND	U	82.8	2060			1
PCB 118	ND	U	74.5	823			1
PCB 122	ND	U	86.9	2060			1
PCB 114	ND	U	80.6	823			1
PCB 105	ND	U	78.9	823			1
PCB 127	ND	U	78.2	2060			1
PCB 126	ND	U	77.1	823			1
PCB 111	ND	U	70.7	2060			1
PCBs 86 + 87 + 97 + 109 + 119 + 125	ND	U	84.8	8230			1
PCB 155	ND	U	26.0	823			1
PCB 152	ND	U	24.0	2060			1
PCB 150	ND	U	22.2	2060			1
PCB 136	ND	U	24.4	2060			1
PCB 145	ND	U	23.0	2060			1
PCB 148	ND	U	31.3	2060			1
PCBs 135 + 151	ND	U	31.8	4120			1
PCB 154	ND	U	32.5	4120			1
PCB 144	ND	U	55.4	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCBs 147 + 149	ND	U	25.4	4120			1
PCB 134	ND	U	23.3	4120			1
PCB 143	ND	U	31.1	4120			1
PCBs 139 + 140	ND	U	25.4	4120			1
PCB 131	ND	U	23.3	2060			1
PCB 142	ND	U	29.9	2060			1
PCB 132	ND	U	27.7	2060			1
PCB 133	ND	U	28.8	2060			1
PCB 165	ND	U	20.4	2060			1
PCB 146	ND	U	24.2	2060			1
PCB 161	ND	U	20.5	2060			1
PCB 141	ND	U	26.3	2060			1
PCB 130	ND	U	30.1	2060			1
PCB 137	ND	U	25.1	2060			1
PCB 164	ND	U	20.5	2060			1
PCBs 129 + 138 + 163	ND	U	25.9	8230			1
PCB 160	ND	U	14.0	8230			1
PCB 158	ND	U	18.8	2060			1
PCBs 128 + 166	ND	U	22.7	4120			1
PCB 159	ND	U	37.3	2060			1
PCB 162	ND	U	34.3	2060			1
PCB 167	ND	U	29.2	823			1
PCBs 156 + 157	ND	U	50.2	1650			1
PCB 169	ND	U	30.1	823			1
PCBs 153 + 168	163**J**		20.3	4120	1.32	0.970	1
PCB 188	407**JK**		37.1	823	0.81	1.000	1
PCB 179	ND	U	29.3	2060			1
PCB 184	ND	U	26.1	2060			1
PCB 176	ND	U	30.0	2060			1
PCB 186	ND	U	27.7	2060			1
PCB 175	ND	U	36.8	2060			1
PCB 187	ND	U	32.6	2060			1
PCB 182	ND	U	36.4	2060			1
PCB 183	71.2**J**		44.7	4120	0.89	1.118	1
PCB 185	ND	U	47.2	4120			1
PCB 174	ND	U	47.7	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 177	ND	U	50.5	2060			1
PCB 181	ND	U	44.8	2060			1
PCBs 171 + 173	ND	U	52.2	4120			1
PCB 172	ND	U	51.9	2060			1
PCB 192	ND	U	37.7	2060			1
PCBs 180 + 193	111**J**		36.1	4120	1.11	0.915	1
PCB 191	ND	U	37.2	2060			1
PCB 170	76.5**JK**		51.2	2060	1.71	0.941	1
PCB 190	ND	U	35.1	2060			1
PCB 189	ND	U	32.7	823			1
PCB 178	ND	U	40.0	2060			1
PCB 202	171**J**		32.1	823	0.91	1.001	1
PCB 201	ND	U	30.6	2060			1
PCB 204	ND	U	30.9	2060			1
PCB 197	ND	U	28.0	4120			1
PCB 200	ND	U	30.6	4120			1
PCBs 198 + 199	ND	U	39.7	4120			1
PCB 196	ND	U	40.5	2060			1
PCB 203	ND	U	34.7	2060			1
PCB 195	ND	U	43.7	2060			1
PCB 194	ND	U	39.7	2060			1
PCB 205	ND	U	36.0	823			1
PCB 208	ND	U	66.6	823			1
PCB 207	ND	U	71.4	2060			1
PCB 206	ND	U	165	823			1
PCB 209	ND	U	44.0	823			1
Total MonoCB	ND	U	35.5	2060			1
Total DiCB	104**J**		17.1	4120			1
Total TriCB	ND	U	91.0	2060			1
Total TetraCB	ND	U	30.6	8230			1
Total PentaCB	ND	U	70.7	8230			1
Total HexaCB	163**J**		20.3	8230			1
Total HeptaCB	ND	U	40.0	4120			1

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Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total OctaCB	171**J**		28.0	4120			1
Total NonaCB	ND	U	66.6	2060			1
Total PCBs	1100**J**		14.0	8230			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	Percent
Lab Code:	EQ1500133-01	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 16:18
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239137	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1667.725	83		5-145	3.06	0.745
PCB 3L	2000	1712.236	86		5-145	3.15	0.873
PCB 4L	2000	1493.240	75		5-145	1.57	0.888
PCB 15L	2000	1740.080	87		5-145	1.55	1.225
PCB 202L	2000	1322.267	66		10-145	0.91	0.826
PCB 205L	2000	1877.453	94		10-145	0.90	1.009
PCB 208L	2000	1353.962	68		10-145	0.78	0.950
PCB 209L	2000	2524.363	126		10-145	1.21	1.073
PCB 37L	2000	1783.528	89		5-145	1.06	1.082
PCB 19L	2000	1590.894	80		5-145	1.04	1.068
PCB 81L	2000	1849.986	92		10-145	0.78	1.331
PCB 77L	2000	1831.129	92		10-145	0.78	1.353
PCB 54L	2000	1365.478	68		5-145	0.81	0.832
PCB 104L	2000	1425.681	71		10-145	1.61	0.827
PCB 118L	2000	1858.368	93		10-145	1.57	1.147
PCB 105L	2000	1949.994	97		10-145	1.57	1.183
PCB 126L	2000	1992.016	100		10-145	1.56	1.274
PCB 114L	2000	1847.053	92		10-145	1.56	1.163
PCB 123L	2000	1863.202	93		10-145	1.55	1.137
PCB 155L	2000	1383.146	69		10-145	1.30	0.800
PCBs 156L + 157L	4000	3687.810	92		10-145	1.26	1.099
PCB 169L	2000	1971.026	99		10-145	1.25	1.176
PCB 167L	2000	1784.942	89		10-145	1.29	1.071
PCB 189L	2000	1773.957	89		10-145	1.07	0.960
PCB 188L	2000	1110.762	56		10-145	1.07	0.727
PCB 28L		0			5-145		
PCB 111L		0			10-145		
PCB 178L		0			10-145		

Accuracy & Precision

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QA/QC Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Analyzed:**	02/25/15
Sample Matrix:	PE	**Date Extracted:**	02/19/15

Duplicate Lab Control Sample Summary
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Units:**	ng/Kg
Prep Method:	Method	**Basis:**	As Received
		Analysis Lot:	434270

	Lab Control Sample EQ1500133-02			Duplicate Lab Control Sample EQ1500133-03					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
PCB 1	77200	82300	94	76600	82300	93	60-135	<1	50
PCB 3	74700	82300	91	74900	82300	91	60-135	<1	50
PCB 15	75400	82300	92	77200	82300	94	60-135	2	50
PCB 4	87900	82300	107	88500	82300	108	60-135	<1	50
PCB 19	81200	82300	99	84200	82300	102	60-135	4	50
PCB 37	75400	82300	92	77100	82300	94	60-135	2	50
PCB 54	89800	82300	109	91200	82300	111	60-135	2	50
PCB 77	77500	82300	94	79400	82300	96	60-135	2	50
PCB 81	76300	82300	93	78600	82300	96	60-135	3	50
PCB 104	88700	82300	108	91300	82300	111	60-135	3	50
PCB 105	76300	82300	93	78000	82300	95	60-135	2	50
PCB 114	76800	82300	93	78700	82300	96	60-135	3	50
PCB 118	77100	82300	94	78800	82300	96	60-135	2	50
PCB 123	78000	82300	95	79100	82300	96	60-135	1	50
PCB 126	76200	82300	93	77900	82300	95	60-135	2	50
PCB 155	86700	82300	105	88500	82300	107	60-135	2	50
PCB 167	77000	82300	94	77700	82300	94	60-135	<1	50
PCB 169	76300	82300	93	78000	82300	95	60-135	2	50
PCBs 156 + 157	156000	165000	95	159000	165000	96	60-135	2	50
PCB 188	91700	82300	111	94000	82300	114	60-135	2	50
PCB 189	79200	82300	96	80600	82300	98	60-135	2	50
PCB 202	83100	82300	101	86800	82300	105	60-135	4	50
PCB 205	82500	82300	100	85700	82300	104	60-135	4	50
PCB 206	82700	82300	101	84500	82300	103	60-135	2	50
PCB 208	85600	82300	104	87500	82300	106	60-135	2	50
PCB 209	74300	82300	90	74500	82300	91	60-135	<1	50

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500133-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 13:13
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239135	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	77200		78.6	823	3.10	1.001	1
PCB 3	74700		92.1	823	3.06	1.001	1
PCB 4	87900		44.7	823	-	1.001	1
PCB 15	75400		43.2	823	-	1.001	1
PCB 19	81200		186	823	1.01	1.001	1
PCB 37	75400		193	823	1.04	1.001	1
PCB 81	76300		138	823	0.77	1.000	1
PCB 77	77500		138	823	0.78	1.000	1
PCB 54	89800		60.0	823	0.76	1.001	1
PCB 104	88700		95.2	823	1.57	1.001	1
PCB 123	78000		253	823	1.55	1.000	1
PCB 118	77100		234	823	1.55	1.000	1
PCB 114	76800		243	823	1.55	1.001	1
PCB 105	76300		244	823	1.55	1.001	1
PCB 126	76200		235	823	1.54	1.000	1
PCB 155	86700		57.5	823	1.25	1.000	1
PCB 167	77000		83.7	823	1.25	1.001	1
PCBs 156 + 157	156000		130	1650	1.26	1.000	1
PCB 169	76300		81.5	823	1.28	1.000	1
PCB 188	91700		37.9	823	1.03	1.001	1
PCB 189	79200		53.4	823	1.02	1.001	1
PCB 202	83100		59.6	823	0.87	1.001	1
PCB 205	82500		64.0	823	0.89	1.000	1
PCB 208	85600		118	823	0.79	1.000	1
PCB 206	82700		666	823	0.80	1.000	1
PCB 209	74300		42.4	823	1.19	1.001	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500133-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 13:13
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239135	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	152000		78.6	2060			1
Total DiCB	163000		43.2	4120			1
Total TriCB	157000		186	2060			1
Total TetraCB	89800		60.0	8230			1
Total PentaCB	473000		95.2	8230			1
Total HexaCB	396000		57.5	8230			1
Total HeptaCB	171000		37.9	4120			1
Total OctaCB	166000		59.6	4120			1
Total NonaCB	168000		118	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500133-02	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 13:13
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239135	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1739.230	87		5-145	3.01	0.745
PCB 3L	2000	1834.641	92		5-145	3.16	0.873
PCB 4L	2000	1630.514	82		5-145	1.56	0.888
PCB 15L	2000	1823.881	91		5-145	1.57	1.225
PCB 202L	2000	1373.315	69		10-145	0.88	0.826
PCB 205L	2000	1949.447	97		10-145	0.92	1.009
PCB 208L	2000	1408.454	70		10-145	0.79	0.950
PCB 209L	2000	2579.426	129		10-145	1.23	1.072
PCB 37L	2000	1785.625	89		5-145	1.04	1.081
PCB 19L	2000	1721.941	86		5-145	1.06	1.068
PCB 81L	2000	1890.779	95		10-145	0.78	1.331
PCB 77L	2000	1891.071	95		10-145	0.79	1.352
PCB 54L	2000	1419.728	71		5-145	0.80	0.832
PCB 104L	2000	1443.294	72		10-145	1.56	0.826
PCB 118L	2000	1862.745	93		10-145	1.60	1.147
PCB 105L	2000	1912.083	96		10-145	1.57	1.183
PCB 126L	2000	2011.870	101		10-145	1.56	1.273
PCB 114L	2000	1893.728	95		10-145	1.58	1.162
PCB 123L	2000	1855.390	93		10-145	1.56	1.137
PCB 155L	2000	1427.701	71		10-145	1.22	0.800
PCBs 156L + 157L	4000	3953.659	99		10-145	1.28	1.099
PCB 169L	2000	2099.136	105		10-145	1.24	1.177
PCB 167L	2000	1847.837	92		10-145	1.25	1.071
PCB 189L	2000	1811.690	91		10-145	1.03	0.960
PCB 188L	2000	1157.552	58		10-145	1.05	0.727
PCB 28L		0			5-145		
PCB 111L		0			10-145		
PCB 178L		0			10-145		

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500133-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 14:15
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239136	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
PCB 1	76600		62.9	823	3.07	1.001	1
PCB 3	74900		72.9	823	3.10	1.001	1
PCB 4	88500		44.9	823	-	1.001	1
PCB 15	77200		38.4	823	-	1.001	1
PCB 19	84200		198	823	1.01	1.002	1
PCB 37	77100		155	823	1.02	1.001	1
PCB 81	78600		142	823	0.78	1.000	1
PCB 77	79400		146	823	0.78	1.000	1
PCB 54	91200		63.0	823	0.76	1.001	1
PCB 104	91300		72.5	823	1.59	1.001	1
PCB 123	79100		144	823	1.57	1.001	1
PCB 118	78800		132	823	1.58	1.001	1
PCB 114	78700		140	823	1.54	1.001	1
PCB 105	78000		140	823	1.53	1.000	1
PCB 126	77900		134	823	1.53	1.001	1
PCB 155	88500		51.5	823	1.26	1.000	1
PCB 167	77700		64.9	823	1.24	1.000	1
PCBs 156 + 157	159000		109	1650	1.24	1.000	1
PCB 169	78000		66.0	823	1.25	1.001	1
PCB 188	94000		24.2	823	1.03	1.001	1
PCB 189	80600		42.4	823	1.04	1.001	1
PCB 202	86800		38.9	823	0.88	1.000	1
PCB 205	85700		41.8	823	0.88	1.000	1
PCB 208	87500		86.3	823	0.77	1.001	1
PCB 206	84500		821	823	0.79	1.001	1
PCB 209	74500		54.3	823	1.16	1.000	1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ1500133-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 14:15
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239136	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Native Analyte Results

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
Total MonoCB	151000		62.9	2060			1
Total DiCB	166000		38.4	4120			1
Total TriCB	161000		155	2060			1
Total TetraCB	91200		63.0	8230			1
Total PentaCB	484000		72.5	8230			1
Total HexaCB	403000		51.5	8230			1
Total HeptaCB	175000		24.2	4120			1
Total OctaCB	172000		38.9	4120			1
Total NonaCB	172000		86.3	2060			1

ALS Group USA, Corp. dba ALS Environmental

Analytical Report

Client:	Science and Engineering for the Environment, LLC	**Service Request:**	K1501568
Project:	RM11E Supplemental RI/FS Investigation	**Date Collected:**	NA
Sample Matrix:	PE	**Date Received:**	NA
Sample Name:	Duplicate Lab Control Sample	**Units:**	Percent
Lab Code:	EQ1500133-03	**Basis:**	As Received

Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS

Analysis Method:	1668C	**Date Analyzed:**	02/25/15 14:15
Prep Method:	Method	**Date Extracted:**	2/19/15
Sample Amount:	24.300mg	**Instrument Name:**	E-HRMS-02
		GC Column:	SPB-OCTYL
Data File Name:	U239136	**Blank File Name:**	U239137
ICAL Date:	02/17/15	**Cal Ver. File Name:**	U239134

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
PCB 1L	2000	1749.185	87		5-145	3.07	0.744
PCB 3L	2000	1833.903	92		5-145	3.11	0.872
PCB 4L	2000	1593.740	80		5-145	1.53	0.888
PCB 15L	2000	1799.796	90		5-145	1.58	1.225
PCB 202L	2000	1311.351	66		10-145	0.91	0.826
PCB 205L	2000	1852.815	93		10-145	0.91	1.009
PCB 208L	2000	1319.845	66		10-145	0.78	0.950
PCB 209L	2000	2431.619	122		10-145	1.19	1.073
PCB 37L	2000	1736.053	87		5-145	1.04	1.082
PCB 19L	2000	1660.410	83		5-145	1.06	1.067
PCB 81L	2000	1787.129	89		10-145	0.79	1.331
PCB 77L	2000	1774.408	89		10-145	0.78	1.353
PCB 54L	2000	1344.583	67		5-145	0.80	0.832
PCB 104L	2000	1382.522	69		10-145	1.58	0.826
PCB 118L	2000	1749.735	87		10-145	1.58	1.147
PCB 105L	2000	1793.394	90		10-145	1.58	1.183
PCB 126L	2000	1858.393	93		10-145	1.56	1.274
PCB 114L	2000	1750.344	88		10-145	1.56	1.163
PCB 123L	2000	1737.688	87		10-145	1.61	1.137
PCB 155L	2000	1356.082	68		10-145	1.21	0.800
PCBs 156L + 157L	4000	3496.980	87		10-145	1.25	1.099
PCB 169L	2000	1860.734	93		10-145	1.22	1.177
PCB 167L	2000	1738.677	87		10-145	1.24	1.071
PCB 189L	2000	1713.758	86		10-145	1.04	0.960
PCB 188L	2000	1126.236	56		10-145	1.07	0.727
PCB 28L		0			5-145		
PCB 111L		0			10-145		
PCB 178L		0			10-145		

Appendix I

MIT Data Deliverable

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

This spreadsheet file provides all of the information that was used in converting GCMS data from Raw Counts to Concentrations/mass (PE or SED).

The overall strategy was as follows:

5 commercial mixtures of PCB congeners to ascertain the congener-specifc retention times and response factors (twice during the course of the analyses).
4 concentrations of a single commercial PCB congener mixture was used to confirm the linear response of the GCMS (and generate statistics).
Multiple **Recovery/Injection** standards and multiple **r.f. check standards** daily.
Raw Counts from the GC/MS were converted into PCB mass and corrected for procedural losses using 13C recovery compounds.
PCB mass was then **normalized to the mass of PE or SED** used to get PCB/g on a congener-specific basis.

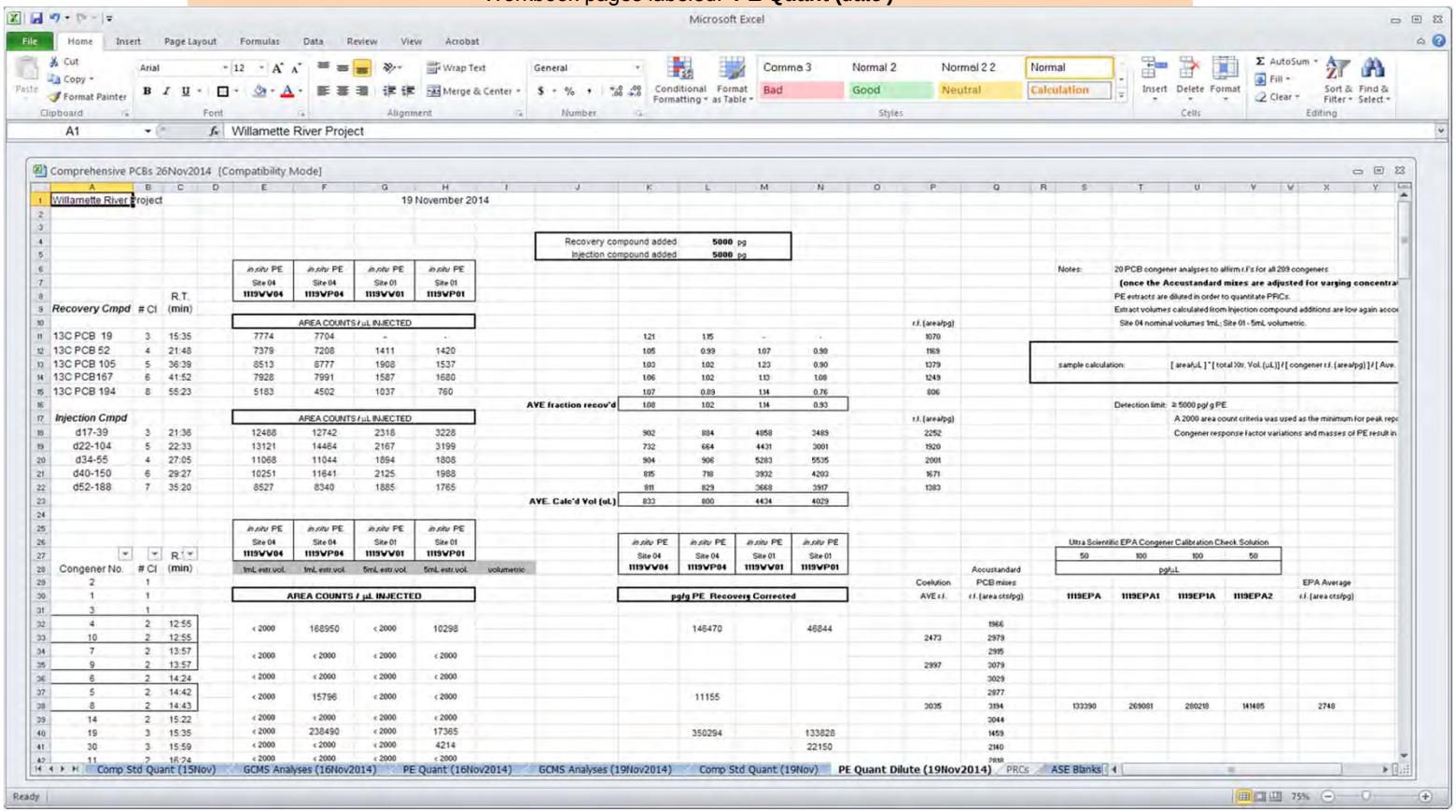
Issues:	**Extreme PRC concentrations**:	PRC concentrations overwhelmed and interfered with some adjacent congeners.
Decisions:	**Coelutions:**	r.f's were averaged for the congeners involved.
	Recovery calculations:	Recoveries were averaged and that average applied to all homolog groups.
	PRCs	No attempt was made to correct congener concentrations for non-equilibrium conditions using PRC's.

The DATA from the PE and SED samples

Workbook pages labeled:	**PE Quant** (date)'	PE extractions
	ASE Blanks (date)'	Accelerated Solvent Extraction - blanks
	Willamette SED (date)'	Accelerated Solvent Extraction - SEDiments

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

DATA from the Extracted Polyethylene Sheets
Workbook pages labeled: **'PE Quant (*date*)'**



Workbook pages that convert **counts /µL** injected into **pg/g** :

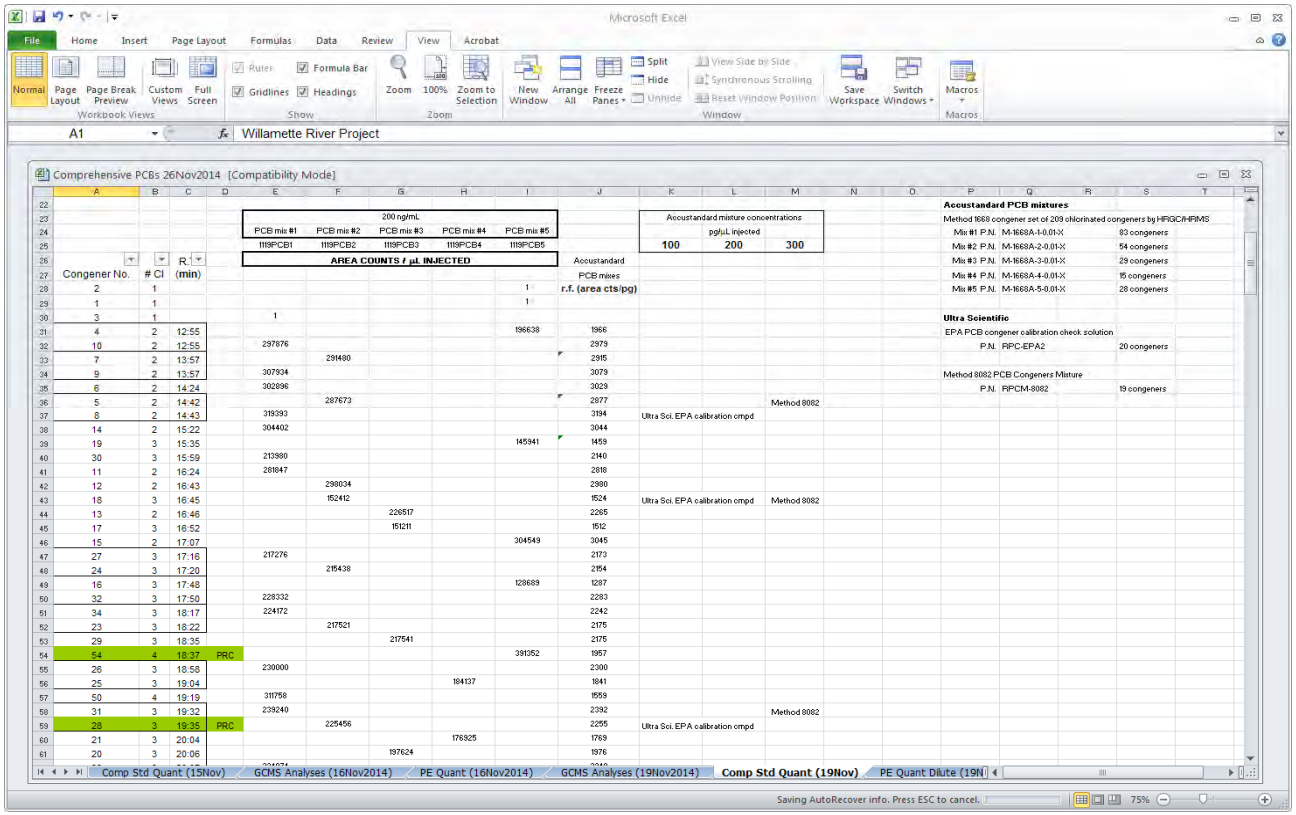
Top section: Rows 4-23 ***Fraction Recovered*** of the 13C PCB congeners for each extract with Averages.
Extract volumes calculated using PCB Injection compounds for each sample with Averages.

Mid section: Rows 25-242 Row 28: extract volumes: estimated by eye (autosampler vial or small volume insert) or from volumetric flask dillutions.
Columns E-H - ***Integration results*** (area counts/µL) including 'less than' areas (our minimum reportable area).
Columns K-N - **Concentrations (pg/gPE)** corrected by recovery compounds.
Columns P-Q - Average response factors for coeluting congeners and congener-specific r.f.'s.
Columns S-X - either a 4-point Calibration curve (12.5-100 pg/µL) using the EPA Calibration check solution (including Lin.Regr. calculation) or the Average response factors of 50 and 100 pg/mL standards to confirm the daily MS response.

Bottom section: Row 241 Columns K-N - **PE or SED dry wgts (g).**
Rows 248-257 Columns E-H - Combined Recovery and Injection compound standard integrations used in calculations in the top section.

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

DATA from the Comprehensive PCB mixtures
Workbook pages labeled: **'Comp Std Quant (*date*)'**

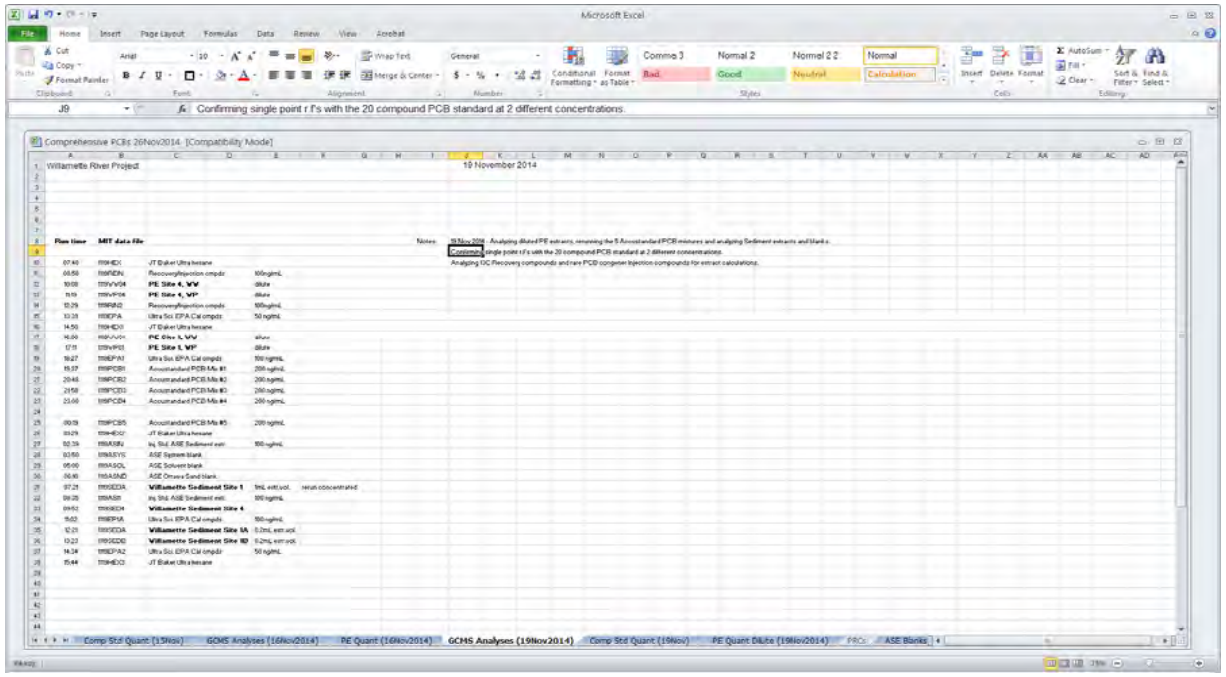


Comprehensive PCB Standards Aanlysis:

2 workbook pages with data collected on ***15 November*** and ***19 November***.
These spreadsheets are used to determine the retention times and congener-specific GCMS response factors (area counts/pg).
Highlighted cells indicate PRC and INJ congeners.
5 different Accustandard© PCB mixtures are analyzed.
2 different Ultra Scientific© PCB mixtures (20 and 19 cmpds each) are used to confirm identifications.
Ultra Scientific© PCB congener calibration check solution was used in a 4 point Calibration curve determination (12.5 - 100 ng/mL concentrations).

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

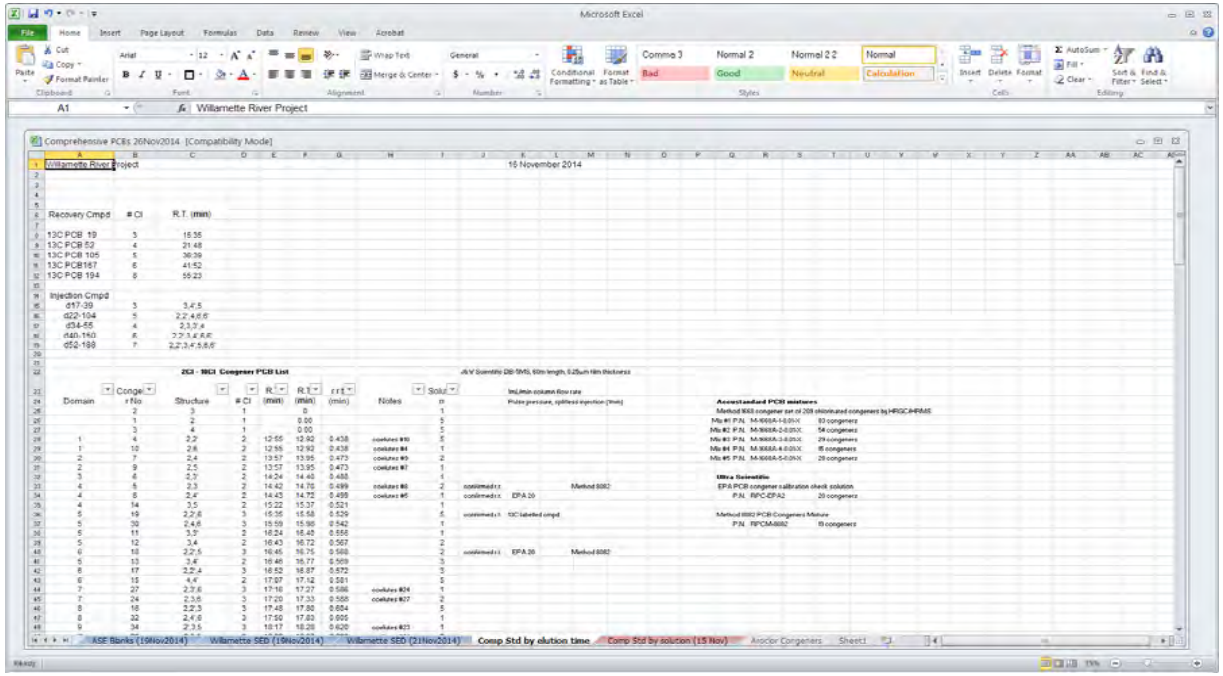
GCMS Daily Analyses Sequences
Workbook pages labeled: **'GCMS Analyses (*date*)'**



GCMS Analyses Sequence: Workbook pages outlining the daily sequence of GCMS runs.

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

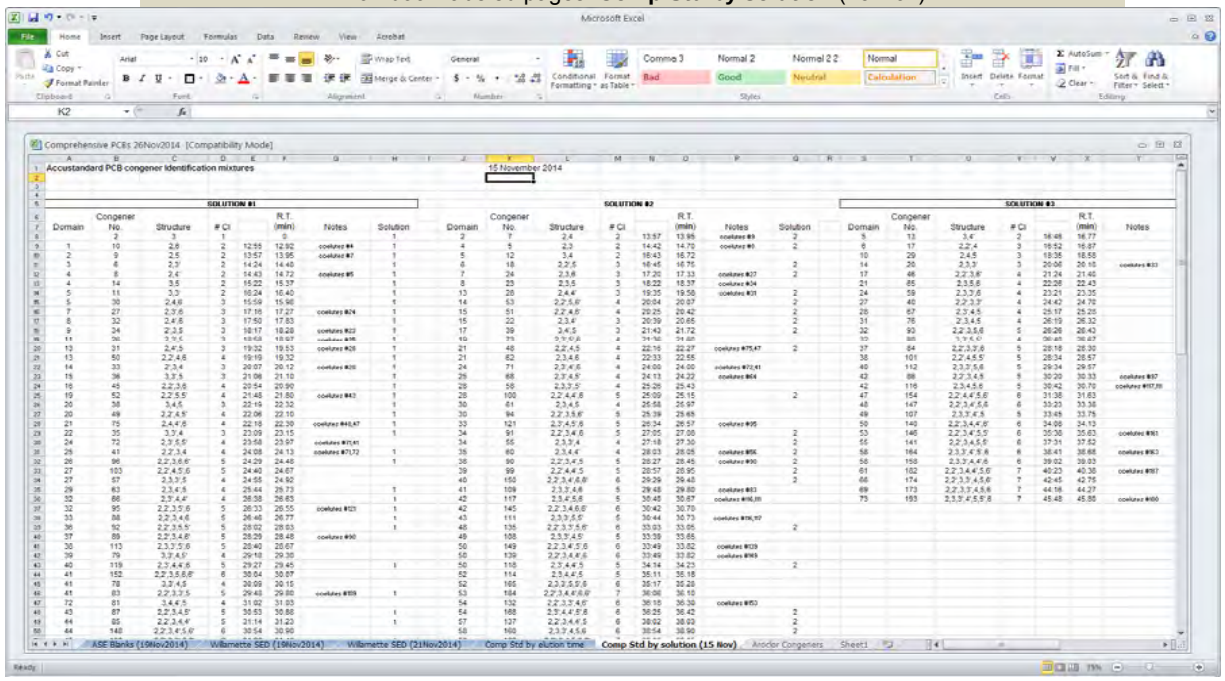
Reference Information
Workbook labeled pages **'Comp Std by elution time'**



Workbook page that lists domain/congener number/structure and Retention Time (clock and decimal format) and Relative Retention Time using d40-150 (Inj.Cmpd) as the reference.

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Reference Information
Workbook labeled pages **'Comp Std by solution** (15 Nov)**'**



Workbook page that lists congener-specific information by Accustandard Comprehensive PCB Mixtures

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411

05 December 2014

Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Results

	Congener No.	# Cl		PE Quant (16Nov2014)					PE Quant Dilute (19Nov2014)					PE Average				
				in situ PE	*in situ PE*	*in situ PE*	*in situ PE*		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	
				Site 04	Site 04	Site 01	Site 01		Site 04	Site 04	Site 01	Site 01		Site 04	Site 04	Site 01	Site 01	
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	
				pg/g PE Recovery Corrected [1]					pg/g PE Recovery Corrected [1]					pg/g PE Recovery Corrected [1]				
1	1	1																
2	2	1																
3	3	1																
4	4+10	2		35388			62256			146470		46844		35388	146470		54550	
5	5+8	2		278	21202		10984			11155				278	16179		10984	
6	6	2		68	5443		2406							68	5443		2406	
7	7+9	2		217	3824		2099							217	3824		2099	
11	11	2		1073										1073				
12	12	2			32046										32046			
13	13	2																
14	14	2		527										527				
15	15	2			12759	7928	6569					38671			12759	7928	22620	
16	16+32	3		1997	93415	1652	27787			62637		23161		1997	78026	1652	25474	
17	17	3		2879	145694	3741	16202		2834	97442		44376		2856	121568	3741	30289	
18	18	3		587	28716					19621		18161		587	24168		18161	
19	19	3		5243		4701	200934			350294		133828		5243	350294	4701	167381	
20	20+21+33	3			18177		4558			15654		67017			16915		35788	
22	22	3			1786										1786			
23	23+34	3																
24	24+27	3		1001	43651		18732			28154		18824		1001	35903		18778	
25	25+26	3		397	6392	44569	53490			9455		36039		397	7923	44569	44765	
28	28+31	3	PRC	7560		972594			5420	271175	543551	8898528		6490	271175	758072	8898528	
29	29	3			10529	21200	284701	PRC		8533					9531	21200	284701	PRC
30	30	3			1842	1982	26646					22150			1842	1982	24398	
35	35	3																
36	36	3		640			1588							640			1588	
37	37	3			1730		5785								1730		5785	
38	38	3		3457	27632	106514	496915	PRC						3457	27632	106514	496915	PRC
39	39	3	INJ															
40	40	4		185	3002		4366							185	3002		4366	
41	41+64+68	4		1263	9120	2935	7373			8406				1263	8763	2935	7373	
42	42	4		676	8257	3321	13508			8896				676	8576	3321	13508	
43	43	4																
44	44	4		1682	22765	5224	25497			17377		16930		1682	20071	5224	21213	
45	45	4			2506		2039								2506		2039	
46	46	4		390	12587		5430			10814				390	11701		5430	
47	47+48+75	4	PRC	73260					55116	502885	1601900	9367098		64188	502885	1601900	9367098	
49	49	4		14347		27290	193214		10719	155335		138983		12533	155335	27290	166099	
50	50	4		995	13879	1240	9261			9148				995	11513	1240	9261	

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411

05 December 2014

Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Results

				PE Quant (16Nov2014)				PE Quant Dilute (19Nov2014)				PE Average			
				in situ PE	*in situ PE*	*in situ PE*	*in situ PE*	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE
				Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**
	Congener No.	# Cl		pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]			
51	51	4		9744		8488	70849	8659	169953		56907	9202	169953	8488	63878
52	52	4		12358			115278	9413	143608		87414	10886	143608		101346
53	53	4		8133		7562	126181	6838	189159			7485	189159	7562	126181
54	54	4	PRC	5946		724171		4888	230071	445004	4741474	5417	230071	584588	4741474
55	55	4	INJ												
56	56+60	4		605	4900	6880	30654		4271		16623	605	4585	6880	23639
57	57	4		159	643	5166	12151				8986	159	643	5166	10568
58	58	4				1366	1927							1366	1927
59	59	4													
61	61	4													
62	62	4													
63	63	4		477	1312							477	1312		
65	65	4													
66	66+80	4		2239	12023	7124	14341		6976		7148	2239	9499	7124	10745
67	67	4		112	457	2419	5437					112	457	2419	5437
69	69	4		399			1976					399			1976
69	69+73 [2]	4			15150		1976		12890				14020		1976
70	70	4		1848	13006	2099	8160		12293			1848	12649	2099	8160
71	71+72	4		2208	33848	4591	20729		23406		12160	2208	28627	4591	16444
73	73	4		974			7099					974			7099
74	74	4		800	3061		2116					800	3061		2116
76	76	4			491								491		
77	77	4		167	380							167	380		
78	78	4													
79	79	4													
81	81	4		730	434							730	434		
82	82	5		1263	7036		7501		7980			1263	7508		7501
84	84	5		1662	15842	2807	10490		14609			1662	15226	2807	10490
85	85+120	5		1071	2540							1071	2540		
87	87+115	5							22097				22097		
88	88	5													
89	89+90+101	5		21758	187654	32093	135413	18646	144812		92946	20202	166233	32093	114180
91	91	5		7625	62543	6698	25101	8070	48578		25663	7847	55561	6698	25382
92	92	5		4201	30351	5062	18113		22731			4201	26541	5062	18113
93	93	5													
93	83+109	5		329	1619		1616					329	1619		1616
94	94	5		1516	13562		6140		10506			1516	12034		6140
95	95+121	5		15718	182045	14066	99142	12844	140655		73853	14281	161350	14066	86497

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411

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Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Results

	Congener No.	# Cl		PE Quant (16Nov2014)					PE Quant Dilute (19Nov2014)					PE Average				
				in situ PE	*in situ PE*	*in situ PE*	*in situ PE*		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	
				Site 04	Site 04	Site 01	Site 01		Site 04	Site 04	Site 01	Site 01		Site 04	Site 04	Site 01	Site 01	
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	
				pg/g PE Recovery Corrected [1]					pg/g PE Recovery Corrected [1]					pg/g PE Recovery Corrected [1]				
96	96	5		1197	16434	2299	11700			13133				1197	14784	2299	11700	
97	97+86+125	5	PRC	230232					174772	402080	5309654	13550250		202502	402080	5309654	13550250	
98	98+102	5		1654	12773	2041	8372			12132				1654	12453	2041	8372	
99	99	5		5960	30872	12938	26452		7291	26976		28278		6626	28924	12938	27365	
100	100	5		5406	36715	4632	12170		5399	28582				5402	32648	4632	12170	
103	103	5		3311	11529	3260	10017			17079				3311	14304	3260	10017	
104	104	5	INJ															
105	105	5		1222	4180		4805							1222	4180		4805	
106	106+118	5		4552	21704	12379	27124		6806	21200		25009		5679	21452	12379	26067	
107	107+108+123	5		1583	8664	3315	7326			9093				1583	8879	3315	7326	
110	110	5		10245	80286	11502	58622		8753	69390		62484		9499	74838	11502	60553	
111	111+116+117	5	PRC						366579	466594	9872466	16544677		366579	466594	9872466	16544677	
112	112	5																
113	113	5																
114	114	5																
119	119	5		2102	10630	2374	5270			9122				2102	9876	2374	5270	
122	122	5		7521	3949	8334	4630	INJ					INJ	7521	3949	8334	4630	
124	124	5			646	1907									646	1907		
126	126	5				9348	10099									9348	10099	
127	127	5																
128	128	6		1267	7113	1607	7818			8843				1267	7978	1607	7818	
129	129	6		40915	31304	829719	1024498	PRC						40915	31304	829719	1024498	PRC
130	130	6		748	4029		3863							748	4029		3863	
131	131	6			1000										1000			
133	133+165	6		261	899	3215	3397							261	899	3215	3397	
134	134+143	6		1337	8852	2674	7560			8855				1337	8853	2674	7560	
135	135	6		5008	31587	16452	37665			29315		32317		5008	30451	16452	34991	
136	136	6		6605	55139	5797	34969		6040	42896		25994		6322	49017	5797	30482	
137	137	6		299	1074									299	1074			
138	138+160	6		10928	76837	10954	61968		9346	68458		60533		10137	72648	10954	61251	
139	139+149	6		24868	193362	22722	132141		20059	162439		110937		22464	177900	22722	121539	
140	140	6		248	993									248	993			
141	141	6		4710	36133	6219	29976			37942				4710	37038	6219	29976	
142	142	6		1512	4189	18928	24622			4103		20426		1512	4146	18928	22524	
144	144	6		1453	13091	1318	9806			8518		9346		1453	10804	1318	9576	
145	145	6																
146	146+161	6		3936	21078	8560	23568		3515	19496		19291		3725	20287	8560	21430	
147	147	6		2365	14555	1996	5481			13616				2365	14085	1996	5481	

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Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Results

	Congener No.	# Cl		PE Quant (16Nov2014)				PE Quant Dilute (19Nov2014)				PE Average			
				in situ PE	*in situ PE*	*in situ PE*	*in situ PE*	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE
				Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**
				pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]			
148	148	6		602	1898							602	1898		
150	**150**	**6**	**INJ**												
151	151	6		10300	80042	11837	56494	9676	62793		53604	9988	71417	11837	55049
152	152	6		324	1759							324	1759		
153	153+132	6	PRC					450694	549747	9692551	15608325	450694	549747	9692551	15608325
154	154	6		978	5294		2239		3849			978	4572		2239
155	155	6		207	464							207	464		
156	156	6		816	4894		4936		5876			816	5385		4936
157	157	6													
158	158	6		1352	9863		9474		9992			1352	9928		9474
159	159	6													
162	162	6													
163	163+164	6		7258	51098	4571	38052	8503	53214		43983	7880	52156	4571	41018
166	166	6													
167	167	6		410	2091		2478					410	2091		2478
168	168	6							39962		32604		39962		32604
169	169	6													
170	170+190	7		3364	24750	4987	18660		13363		10758	3364	19057	4987	14709
171	171	7		1010	7853		7058		7480			1010	7666		7058
172	172+192	7		660	3705		3470		4644			660	4174		3470
173	173	7			830								830		
174	174+181	7		4566	33436	5677	25021	4251	32602		26621	4408	33019	5677	25821
175	175	7		1637	2456	19038	24940					1637	2456	19038	24940
176	176	7		626	5610		4121		5608			626	5609		4121
177	177	7		2928	19735	3749	15880		19168			2928	19452	3749	15880
178	178	7	PRC	541646				428859	362539	7878159	12488829	485253	362539	7878159	12488829
179	179	7		3109	22071	3236	14655		17662			3109	19867	3236	14655
180	180+193	7		7527	53728	8303	36778	7717	60097		40606	7622	56913	8303	38692
182	182+187	7		6687	44263	8686	31692		44781		38809	6687	44522	8686	35251
183	183	7		2654	18281	4599	15009		18202			2654	18242	4599	15009
184	184	7		215	132							215	132		
185	185	7		778	4139		4443		4812			778	4476		4443
186	186	7													
188	188	7	INJ												
189	189	7			840								840		
191	191	7			1153								1153		
194	194	8		1004	5559		4593		10523			1004	8041		4593
195	195	8		649	3287		2903					649	3287		2903

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Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

Results

	Congener No.	# Cl		PE Quant (16Nov2014)				PE Quant Dilute (19Nov2014)				PE Average			
				in situ PE	*in situ PE*	*in situ PE*	*in situ PE*	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE
				Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01	Site 04	Site 04	Site 01	Site 01
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**
				pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]				pg/g PE Recovery Corrected [1]			
196	196+203	8		1199	7939	3718	6110		13252			1199	10596	3718	6110
197	197	8			468								468		
198	198	8			649	2916	4207						649	2916	4207
199	199	8		1328	7099	2724	5045		8947			1328	8023	2724	5045
200	200	8			1173								1173		
201	201	8			1336		1454						1336		1454
202	202	8													
204	204	8			382								382		
205	205	8			562								562		
206	206	9			1039								1039		
207	207	9			165								165		
208	208	9			159								159		
209	209	10													

Notes:
1. MIT values are surrogate-corrected based on the recovery of PCBs injected as standards during the analyses.
2. For Congeners 69 and 73, the concentrations were sufficiently high in the PWP004 samples that the peaks could not be separately resolved. For PWP004, those congeners are reported as a co-eluted results. For all other measures, Congeners 69 and 73 are resolved separately.
PRC: Interference from PRC. Data highly suspect.
INJ: Interference from injection compound. Data should be considered an estimate.

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
2	1							1	**r.f. (area cts/pg)**								
1	1							1									
3	1			1													
4	2	12:55						220034	2200								
10	2	12:55		333360					3334								
7	2	13:57			364860				3649								
9	2	13:57		360594					3606					Method 8082 PCB Congeners Mixture			
6	2	14:24		344913					3449					P.N.	RPCM-8082		19 congeners
5	2	14:42			357137				3571			Method 8082					
8	2	14:43		362071					3621	Ultra Sci. EPA calibration cmpd							
14	2	15:22		359811					3598								
19	3	15:35						162810	1628								
30	3	15:59		253812					2538								
11	2	16:24		354125					3541								
12	2	16:43			394601				3946								
18	3	16:45			185538				1855	Ultra Sci. EPA calibration cmpd		Method 8082					
13	2	16:46				325896			3259								
17	3	16:52				180749			1807								
15	2	17:07						340367	3404								
27	3	17:16		245140					2451								

Lower Willamette RM11 East Project										15 November 2014							
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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
24	3	17:20			256268				2563								
16	3	17:48						149892	1499								
32	3	17:50		267484					2675								
34	3	18:17		257815					2578								
23	3	18:22			267546				2675								
29	3	18:35				263232			2632								
54	4	18:37	PRC					436706	2184								
26	3	18:58		266913					2669								
25	3	19:04					270164		2702								
50	4	19:19		356273					1781								
31	3	19:32		275339					2753			Method 8082					
28	3	19:35	PRC		287786				2878	Ultra Sci. EPA calibration cmpd							
21	3	20:04					260671		2607								
20	3	20:06				241830			2418								
33	3	20:07		260071					2601								
53	4	20:04			374971				1875								
51	4	20:25			371698				1858								
22	3	20:39			265918				2659								
45	4	20:54		328602					1643								
36	3	21:06		267888					2679								

Lower Willamette RM11 East Project										15 November 2014							
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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
46	4	21:24				307394			1537								
69	4	21:32					460651		2303								
73	4	21:36			476064				2380								
39	3	21:43	INJ		289056				2891								
52	4	21:48		375206					1876	Ultra Sci. EPA calibration cmpd		Method 8082					
43	4	21:54						308334	1542								
49	4	22:06		386106					1931								
48	4	22:16			395770				1979								
47	4	22:18	PRC				416016		2080								
75	4	22:18		501013					2505								
38	3	22:19		274936					2749								
65	4	22:26				470132			2351								
62	4	22:33			486709				2434								
104	5	22:51	INJ					421877	2109								
35	3	23:09		273751					2738								
44	4	23:13						313109	1566	Ultra Sci. EPA calibration cmpd		Method 8082					
59	4	23:21				469473			2347								
42	4	23:28					348430		1742								
37	3	23:45						231202	2312								
72	4	23:58		503226					2516								

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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
71	4	24:00			513175				2566								
41	4	24:08		353248					1766								
64	4	24:11					525192		2626								
68	4	24:13			541380				2707								
96	5	24:29		433415					2167								
103	5	24:40		363557					1818								
40	4	24:42				287889			1439								
57	4	24:55		496959					2485								
100	5	25:09			368686				1843								
67	4	25:17				514933			2575								
58	4	25:26			508866				2544								
94	5	25:39			317790				1589								
63	4	25:44		500887					2504								
61	4	25:58			429317				2147								
74	4	26:04						474532	2373								
98	5	26:16						306009	1530								
102	5	26:16					360772		1804								
76	4	26:19				488768			2444								
70	4	26:26					525055		2625								
93	5	26:26				311284			1556								

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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
95	5	26:33		334142					1671								
121	5	26:34			464918				2325								
66	4	26:38		518968					2595	Ultra Sci. EPA calibration cmpd		Method 8082					
80	4	26:40				538495			2692								
88	5	26:46		322961					1615								
91	5	27:05			356313				1782								
55	4	27:18	INJ		503634				2518								
155	6	27:37						385468	1927								
56	4	27:57						453291	2266								
60	4	28:03			515375				2577								
92	5	28:02		325778					1629								
84	5	28:18				302416			1512								
90	5	28:27			339416				1697								
89	5	28:29		311632					1558								
101	5	28:34				394565			1973	Ultra Sci. EPA calibration cmpd		Method 8082					
113	5	28:40		420711					2104								
99	5	28:57			399424				1997								
79	4	29:18		507664					2538								
119	5	29:27		459709					2299								
150	**6**	**29:29**	**INJ**		400281				2001								

Lower Willamette RM11 East Project										15 November 2014							
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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
112	5	29:34				455971			2280								
83	5	29:48		281265					1406								
109	5	29:48			452199				2261								
152	6	30:04		385208					1926								
78	4	30:09		513443					2567								
97	5	30:18	PRC				337967		1690								
86	5	30:20				317206			1586								
125	5	30:24						422217	2111								
117	5	30:40			469047				2345								
116	5	30:42				437212			2186								
111	5	30:44	PRC		491989				2460								
145	6	30:42			400421				2002								
115	5	30:51					474413		2372								
87	5	30:53		352904					1765			Method 8082					
148	6	30:54		289894					1449								
81	4	31:02		489822					2449								
85	5	31:14		834847					2087								
120	5	31:14							2087								
136	6	31:26		385195					1926								
154	6	31:38				342849			1714								

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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
110	5	31:41						431142	2156			Method 8082					
77	4	31:58						415882	2079	Ultra Sci. EPA calibration cmpd							
82	5	32:40		311214					1556								
151	6	32:43		298867					1494			Method 8082					
135	6	33:03			296848				1484								
144	6	33:11		296536					1483								
147	6	33:23				307881			1539								
124	5	33:30		463945					2320								
108	5	33:39			453296				2266								
107	5	33:45				480765			2404								
123	5	33:53					448908		2245								
139	6	33:49			633388				1583								
149	6	33:49							1583								
140	6	34:08				309399			1547								
106	5	34:10		444960					2225								
118	5	34:14			453386				2267	Ultra Sci. EPA calibration cmpd							
143	6	34:36		273929					1370								
134	6	34:43					265525		1328								
142	6	35:01		275562					1378								
131	6	35:09					274286		1371								

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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
114	5	35:11			474425				2372								
133	6	35:14		278064					1390								
165	6	35:17			368762				1844								
122	5	35:20		448153					2241								
188	7	35:22	INJ					318273	1591								
146	6	35:38				388947			1945								
161	6	35:38		313110					1566								
184	7	36:06			353411				1767								
153	6	36:17	PRC	344990					1725	Ultra Sci. EPA calibration cmpd		Method 8082					
132	6	36:18			401523				2008								
168	6	36:25			285476				1427								
105	5	36:39		447313					2237	Ultra Sci. EPA calibration cmpd							
127	5	36:50		467706					2339								
179	7	37:28		329896					1649								
141	6	37:31				300469			1502			Method 8082					
137	6	38:02			311200				1556								
176	7	38:13		329516					1648								
130	6	38:17		276448					1382								
164	6	38:41				389706			1949								
163	6	38:43					405533		2028								

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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
138	6	38:54						389469	1947	Ultra Sci. EPA calibration cmpd		Method 8082					
160	6	38:54			290047				1450								
158	6	39:02				409950			2050								
186	7	39:03			337324				1687								
178	7	39:29	PRC	243957					1220								
129	6	39:33		278003					1390								
126	5	40:00						398400	1992	Ultra Sci. EPA calibration cmpd							
175	7	40:04		249788					1249								
166	6	40:11		384075					1920								
182	7	40:23				267318			1337								
187	7	40:23			279652				1398	Ultra Sci. EPA calibration cmpd		Method 8082					
159	6	40:42		383593					1918								
183	7	40:55		273272					1366			Method 8082					
162	6	41:14			403079				2015								
128	6	41:31			291052				1455	Ultra Sci. EPA calibration cmpd							
167	6	41:52		395956					1980								
185	7	42:02			263010				1315								
174	7	42:45				248870			1244								
181	7	42:51			265744				1329								
177	7	43:15		237551					1188								

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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
202	8	43:31						cut off	0								
171	7	43:45		242669					1213								
156	6	44:06		375839					1879								
173	7	44:16				224260			1121								
201	8	44:21		473161					1577								
157	6	44:33			383035				1915								
204	8	44:36		460928					1536								
192	7	44:56			305004				1525								
172	7	45:02		235539					1178								
197	8	45:12			495340				1651								
180	7	45:45					261681		1308	Ultra Sci. EPA calibration cmpd		Method 8082					
193	7	45:48				326695			1633								
191	7	46:13		311440					1557								
200	8	46:50		463557					1545								
169	6	48:03						330891	1654								
170	7	48:39		530904					1327	Ultra Sci. EPA calibration cmpd		Method 8082					
190	7	48:39							1327								
198	8	49:05		329661					1099								
199	8	49:23			342740				1142								
203	8	50:01			374924				1250								

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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
196	8	50:03		344824					1149								
189	7	51:49						274384	1372								
208	9	52:52						390429	1301								
195	8	53:04		311996					1040	Ultra Sci. EPA calibration cmpd							
207	9	53:49		467706					1559								
194	8	55:23		328655					1096								
205	8	55:46						366934	1223								
206	9	59:05						266594	889	Ultra Sci. EPA calibration cmpd		Method 8082					
209	10	62:13						317176	1057	Ultra Sci. EPA calibration cmpd							
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5									
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5									
		congener count		81	53	29	15	27									
				2 coelutions	1 coelution			1 missed ion									
				PCB 85,120	PCB 138,149			PCB 202									
				PCB 170,190													

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	GCMS Analysis Sequence														
16 November 2014															
Run time	**MIT data file**						Notes:	16 Nov 2014 - Analyzing Aroclor 1242 and 1260 technical mixtures as an aid in congen							
								Confirming single point r.f's with a 20 compound PCB standard 4-point CAL curve.							
08:57	1116HEX	JT Baker Ultra hexane						Analyzing 13C Recovery compounds and rare PCB congener Injection compounds for							
10:07	1116AR42	Aroclor 1242 technical mix						Analyzing concentrated PE extracts.							
11:17	1116AR60	Aroclor 1260 technical mix													
12:27	1116HEX1	JT Baker Ultra hexane													
13:38	1116REIN	Recovery/Injection cmpds		100ng/mL											
14:48	1116EPA	Ultra Sci. EPA Cal cmpds		12.5 ng/mL											
15:58	1116EPA1	Ultra Sci. EPA Cal cmpds		25 ng/mL											
17:09	1116EPA2	Ultra Sci. EPA Cal cmpds		50 ng/mL											
18:19	1116EPA3	Ultra Sci. EPA Cal cmpds		100 ng/mL											
19:29	1116ULTR	Ultra Sci. Method 8082 mix		100 ng/mL											
20:39	1116HEX2	JT Baker Ultra hexane													
21:50	1116WW04	**PE Site 4, WW**		~50µL extract volume											
23:00	1116WP04	**PE Site 4, WP**		~50µL extract volume											
00:11	1116RIN2	Recovery/Injection cmpds		100ng/mL											
01:21	1116WW01	**PE Site 1, WW**		~200µL extract volume											
02:31	1116WP01	**PE Site 1, WP**		~200µL extract volume											
03:41	1116EP2A	Ultra Sci. EPA Cal cmpds		50 ng/mL											
04:52	1116HEX3	JT Baker Ultra hexane													

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

16 November 2014

Recovery compound added	**5000** pg
Injection compound added	**5000** pg

Notes: CAL curves for 20 PCB congeners affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
PE extracts are dominated by non-labelled PRCs (~10x higher than targets).
Extract volumes calculated from Injection compound additions appear to be low according to eyeball test.
Site 04 nominal volumes 50µL; Site 01 nominal volumes 200µL.

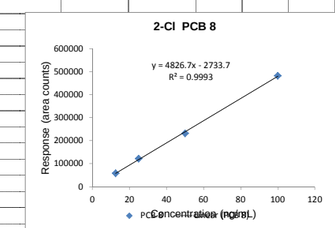
sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

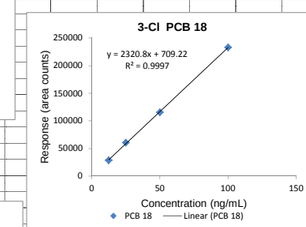
Detection limit: ≥ 500 pg/ g PE concentrations for all chlorination groups
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

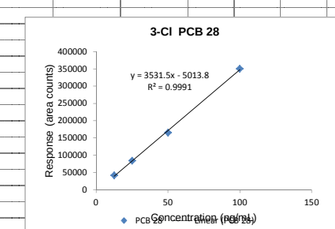
color code: Values are suspect when comparing H2O and Sediment PE
H2O PE values are suspect - no confirming signal in SED PE

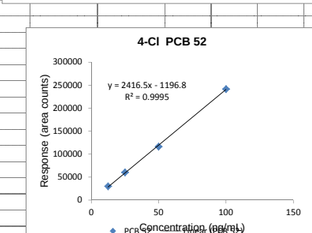
	# Cl	R.T. (**min**)		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE							
				Site 04	Site 04	Site 01	Site 01							
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**							
Recovery Cmpd														
				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
13C PCB 19	3	15:35		298404	349702	54985	49942			0.77	0.83	0.84	0.92	1555
13C PCB 52	4	21:48		357921	393238	65024	48061			0.86	0.86	0.92	0.82	1679
13C PCB 105	5	36:39		421414	412516	70455	56742			0.88	0.78	0.86	0.84	1939
13C PCB167	6	41:52		345972	321566	57561	42988			0.87	0.73	0.85	0.77	1609
13C PCB 194	8	55:23		175391	155871	28452	21818			0.78	0.63	0.74	0.69	912
									AVE fraction recov'd	0.83	0.77	0.84	0.81	
Injection Cmpd				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
d17-39	3	21:36		736910	888413	129229	92706			20	16	112	156	2891
d22-104	5	22:33		531489	689921	95250	99645			20	15	111	106	2109
d34-55	4	27:05		604962	602432	99980	80928			21	21	126	156	2518
d40-150	6	29:27		490247	542375	79947	67515			20	18	125	148	2001
d52-188	7	35:20		392719	380807	67407	52295			20	21	118	152	1591
									AVE. Calc'd Vol (uL)	20	18	118	144	

Congener No.	# Cl	R.T. (**min**)		*in situ* PE Site 04 **1116WW04** 50µL extr.vol.	*in situ* PE Site 04 **1116WP04** 50µL extr.vol.	*in situ* PE Site 01 **1116WW01** 200µL extr.vol.	*in situ* PE Site 01 **1116WP01** 200µL extr.vol.	approximate	*in situ* PE Site 04 **1116WW04**	*in situ* PE Site 04 **1116WP04**	*in situ* PE Site 01 **1116WW01**	*in situ* PE Site 01 **1116WP01**	Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)	Ultra Scientific EPA Congener Calibration Check Solution 12.5 pg/µL **1116EPA**	25 pg/µL **1116EPA1**	50 pg/µL **1116EPA2**	100 pg/µL **1116EPA3**	EPA LinRegr. r.f. (area cts/pg)
				AREA COUNTS / µL INJECTED					**pg/g PE Recovery Corrected**										
2	1																		
1	1																		
3	1																		
4	2	12:55		829589	overload	< 2000	373191		35388			62256		2200					
10	2	12:55											2767	3334					
7	2	13:57		6671	212681	< 2000	16493		217	3824		2099		3649					
9	2	13:57											3627	3606					
6	2	14:24		< 2000	287899	< 2000	17980		68	5443		2406		3449					
5	2	14:42		8477	1169140	< 2000	85572		278	21202		10984		3571					
8	2	14:43											3596	3621	58589	121475	231554	482445	4827
14	2	15:22		16061	< 2000	< 2000	< 2000		527					3598					
19	3	15:35		72317	overload	10503	708733		5243		4701	200934		1628					
30	3	15:59		< 2000	71688	6903	146521			1842	1982	26646		2538					
11	2	16:24		32192	< 2000	< 2000	< 2000		1073					3541					
12	2	16:43		< 2000	1939068	< 2000	< 2000			32046				3946					
18	3	16:45		9232	816993	< 2000	< 2000		587	28716				1855	28741	60787	115371	233082	2321
13	2	16:46		< 2000	< 2000	< 2000	< 2000							3259					
17	3	16:52		44084	4038165	9280	63446		2879	145694	3741	16202		1807					
15	2	17:07		< 2000	665939	37032	48440			12759	7928	6569		3404					
27	3	17:16		21255	1678130	< 2000	101739		1001	43651		18732		2451					
24	3	17:20											2507	2563					
16	3	17:48		35316	2989392	4730	125628		1997	93415	1652	27787		1499					
32	3	17:50											2087	2675					
34	3	18:17		< 2000	< 2000	< 2000	< 2000							2578					
23	3	18:22											2627	2675					
29	3	18:35		< 2000	424989	76582	1623591			10529	21200	284701		2632					
54	4	18:37	PRC	109995	overload	2169927	overload		5946		724171			2184					
26	3	18:58		9022	263195	164242	311192		397	6392	44569	53490		2669					
25	3	19:04											2685	2702					
50	4	19:19		15017	379129	3032	35739		995	13879	1240	9261		1781					
31	3	19:32		180356	overload	3757951	overload		7560		972594			2753					
28	3	19:35	PRC										2816	2878	41699	84280	165557	350567	3532
21	3	20:04		< 2000	739012	< 2000	26183			18177		4558		2607					
20	3	20:06												2418					
33	3	20:07											2651	2601					
53	4	20:04		129187	overload	19457	512519		8133		7562	126181		1875					
51	4	20:25		153434	overload	21647	285262		9744		8488	70849		1858					
22	3	20:39		< 2000	72834	< 2000	< 2000			1786				2659					
45	4	20:54		< 2000	63125	< 2000	7258			2506		2039		1643					
36	3	21:06		14523	< 2000	< 2000	9216		640			1588		2679					
46	4	21:24		5078	296664	< 2000	18081		390	12587		5430		1537					
69	4	21:32		7794	544034	< 2000	9862		399	15150		1976		2303					
73	4	21:36		19649		4613	36608		974			7099	2342	2380					
39	3	21:43	INJ	736910	888413	129229	92706							2891					
52	4	21:48		196424	overload	28129	468527		12358			115278		1876	29927	60292	116403	241676	2416
43	4	21:54		< 2000	< 2000	< 2000	< 2000							1542					
49	4	22:06		234668	overload	72297	808097		14347		27290	193214		1931					
48	4	22:16												1979					
47	4	22:18	PRC	1358063	overload	overload	overload		73260					2080					
75	4	22:18											2188	2505					
38	3	22:19		80537	1164953	401866	2959800		3457	27632	106514	496915		2749					
65	4	22:26		< 2000	< 2000	< 2000	< 2000							2351					
62	4	22:33		< 2000	< 2000	< 2000	< 2000							2434					
104	5	22:51	INJ	531489	689921	95250	99645							2109					









Lower Willamette RM11 East Project
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MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

16 November 2014

Recovery compound added	**5000** pg
Injection compound added	**5000** pg

Notes: CAL curves for 20 PCB congeners affirm r.f's for all 209 congeners
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PE extracts are dominated by non-labelled PRCs (~10x higher than targets).
Extract volumes calculated from Injection compound additions appear to be low according to eyeball test.
Site 04 nominal volumes 50µL; Site 01 nominal volumes 200µL.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

Detection limit: ≥ 500 pg/ g PE concentrations for all chlorination groups
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

color code: Values are suspect when comparing H2O and Sediment PE
H2O PE values are suspect - no confirming signal in SED PE

	# Cl	R.T. (min)		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		
				Site 04	Site 04	Site 01	Site 01							
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		
Recovery Cmpd									Site 04	Site 04	Site 01	Site 01		
				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
13C PCB 19	3	15:35		298404	349702	54985	49942		0.77	0.83	0.84	0.92	1555	
13C PCB 52	4	21:48		357921	393238	65024	48061		0.86	0.86	0.92	0.82	1679	
13C PCB 105	5	36:39		421414	412516	70455	56742		0.88	0.78	0.86	0.84	1939	
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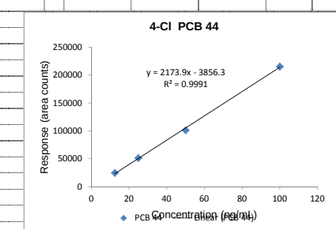
13C PCB 194	8	55:23		175391	155871	28452	21818		0.78	0.63	0.74	0.69	912	
								AVE fraction recov'd	0.83	0.77	0.84	0.81		
Injection Cmpd				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
d17-39	3	21:36		736910	888413	129229	92706		20	16	112	156	2891	
d22-104	5	22:33		531489	689921	95250	99645		20	15	111	106	2109	
d34-55	4	27:05		604962	602432	99980	80928		21	21	126	156	2518	
d40-150	6	29:27		490247	542375	79947	67515		20	18	125	148	2001	
d52-188	7	35:20		392719	380807	67407	52295		20	21	118	152	1591	
								AVE. Calc'd Vol (uL)	20	18	118	144		

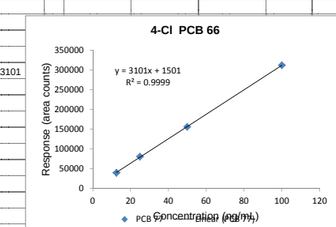
Ultra Scientific EPA Congener Calibration Check Solution

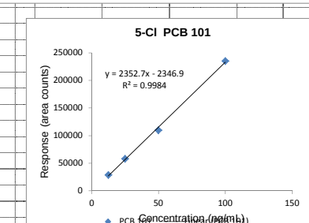
	12.5	25	50	100
	pg/µL			
1116EPA	**1116EPA1**	**1116EPA2**	**1116EPA3**	
24734	51387	101012	215041	2174

Congener No.	# Cl	R.T. (min)		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE			
				Site 04	Site 04	Site 01	Site 01			Site 04	Site 04	Site 01	Site 01			
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**			**1116WW04**	**1116WP04**	**1116WW01**	**1116WP01**		Accustandard	
				50µL extr.vol.	50µL extr.vol.	200µL extr.vol.	200µL extr.vol.	approximate								
				AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					PCB mixes	
														AVE r.f.	r.f. (area cts/pg)	
35	3	23:09		< 2000	< 2000	< 2000	< 2000								2738	
44	4	23:13		22307	546522	11224	86477			1682	22765	5224	25497		1566	
59	4	23:21		< 2000	40375	< 2000	< 2000								2347	
42	4	23:28		9975	220583	7939	50984			676	8257	3321	13508		1742	
37	3	23:45		< 2000	61332	< 2000	28976				1730		5785		2312	
72	4	23:58		47530	1318892	16008	114110			2208	33848	4591	20729		2516	
71	4	24:00												2541	2566	
41	4	24:08		25312	330952	9530	37800			1263	9120	2935	7373		1766	
64	4	24:11													2626	
68	4	24:13												2366	2707	
96	5	24:29		21985	546116	6838	54928			1197	16434	2299	11700		2167	
103	5	24:40		50987	321370	8132	39449			3311	11529	3260	10017		1818	
40	4	24:42		2253	66269	< 2000	13615			185	3002		4366		1439	
57	4	24:55		3354	24485	17615	65411			159	643	5166	12151		2485	
100	5	25:09		84427	1037842	11718	48605			5406	36715	4632	12170		1843	
67	4	25:17		2453	18062	8548	30326			112	457	2419	5437		2575	
58	4	25:26		< 2000	< 2000	4770	10623					1366	1927		2544	
94	5	25:39		20405	330434	< 2000	21136			1516	13562		6140		1589	
63	4	25:44		10115	50373	< 2000	< 2000			477	1312				2504	
61	4	25:58		< 2000	< 2000	< 2000	< 2000								2147	
74	4	26:04		16079	111362	< 2000	10879			800	3061		2116		2373	
98	5	26:16		23358	326512	4668	30236			1654	12773	2041	8372		1530	
102	5	26:16												1667	1804	
76	4	26:19		< 2000	18393	< 2000	< 2000				491				2444	
70	4	26:26		41094	523569	7562	46410			1848	13006	2099	8160		2625	
93	5	26:26		< 2000	< 2000	< 2000	< 2000								1556	
95	5	26:33		266023	5576528	38560	429067			15718	182045	14066	99142		1671	
121	5	26:34												1998	2325	
66	4	26:38		50155	487385	25846	82138			2239	12023	7124	14341		2595	
80	4	26:40												2644	2692	
88	5	26:46		< 2000	< 2000	< 2000	< 2000								1615	
91	5	27:05		115086	1708635	16375	96883			7625	62543	6698	25101		1782	
55	4	27:18	INJ	604962	602432	99980	80928								2518	
155	6	27:37		3381	13711	< 2000	< 2000			207	464				1927	
56	4	27:57		12406	181957	22865	160825			605	4900	6880	30654		2266	
60	4	28:03												2422	2577	
92	5	28:02		57983	758117	11316	63919			4201	30351	5062	18113		1629	
84	5	28:18		21291	367319	5825	34365			1662	15842	2807	10490		1512	
90	5	28:27													1697	
89	5	28:29		321257	5014683	76750	511244			21758	187654	32093	135413		1558	
101	5	28:34												1743	1973	
113	5	28:40		< 2000	< 2000	< 2000	< 2000								2104	
99	5	28:57		100852	945432	35457	114450			5960	30872	12938	26452		1997	
79	4	29:18		< 2000	< 2000	< 2000	< 2000								2538	
119	5	29:27		40930	374659	7489	26241			2102	10630	2374	5270		2299	
150	**6**	**29:29**	**INJ**	490247	542375	79947	67515								2001	
112	5	29:34		< 2000	< 2000	< 2000	< 2000								2280	
83	5	29:48		5118	45510	< 2000	6418			329	1619		1616		1406	
109	5	29:48												1834	2261	
152	6	30:04		5287	51947	< 2000	< 2000			324	1759				1926	
78	4	30:09		< 2000	< 2000	< 2000	< 2000								2567	
97	5	30:18	PRC												1690	
86	5	30:20		3502620	overload	overload	overload			230232					1586	
125	5	30:24												1796	2111	
117	5	30:40													2345	
116	5	30:42		overload	overload	overload	overload								2186	

	1116EPA	1116EPA1	1116EPA2	1116EPA3	
39558	80415	155706	311769	3101	
28923	57957	109804	235064	2353	







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16 November 2014

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	# Cl	R.T. (**min**)		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE							
				Site 04	Site 04	Site 01	Site 01							
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**							
Recovery Cmpd									*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE		
									Site 04	Site 04	Site 01	Site 01		
				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
13C PCB 19	3	15:35		298404	349702	54985	49942		0.77	0.83	0.84	0.92	1555	
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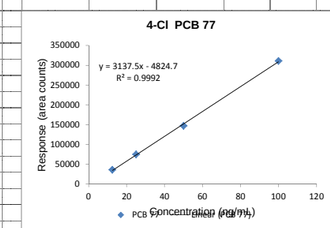
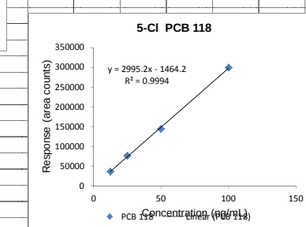
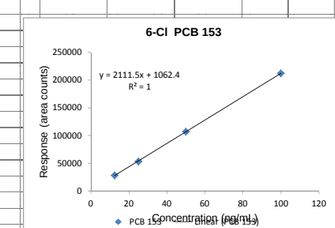
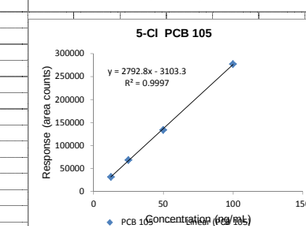
Injection Cmpd				AREA COUNTS / µL INJECTED									r.f. (area/pg)	
d17-39	3	21:36		736910	888413	129229	92706		20	16	112	156	2891	
d22-104	5	22:33		531489	689921	95250	99645		20	15	111	106	2109	
d34-55	4	27:05		604962	602432	99980	80928		21	21	126	156	2518	
d40-150	6	29:27		490247	542375	79947	67515		20	18	125	148	2001	
d52-188	7	35:20		392719	380807	67407	52295		20	21	118	152	1591	
								AVE. Calc'd Vol (uL)	20	18	118	144		

				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE													
				Site 04	Site 04	Site 01	Site 01		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE			Ultra Scientific EPA Congener Calibration Check Solution					
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**		Site 04	Site 04	Site 01	Site 01			12.5	25	50	100		
Congener No.	# Cl	R.T. (**min**)		50µL extr.vol.	50µL extr.vol.	200µL extr.vol.	200µL extr.vol.	approximate	**1116WW04**	**1116WP04**	**1116WW01**	**1116WP01**		Accustandard	pg/µL					
				AREA COUNTS / µL INJECTED					**pg/g PE Recovery Corrected**				Coelution	PCB mixes						
													AVE r.f.	r.f. (area cts/pg)	**1116EPA**	**1116EPA1**	**1116EPA2**	**1116EPA3**		
111	5	30:44	PRC										2330	2460						
145	6	30:42		< 2000	< 2000	< 2000	< 2000							2002						
115	5	30:51		overload	overload	overload	overload							2372						
87	5	30:53											2068	1765						
148	6	30:54		7391	42190	< 2000	< 2000		602	1898				1449						
81	4	31:02		15148	16317	< 2000	< 2000		730	434				2449						
85	5	31:14		18934	81284	< 2000	< 2000		1071	2540				2087						
120	5	31:14											2087	2087						
136	6	31:26		107770	1628462	15322	145911		6605	55139	5797	34969		1926						
154	6	31:38		14203	139161	< 2000	8315		978	5294		2239		1714						
110	5	31:41		187114	2653978	34026	273778		10245	80286	11502	58622		2156						
77	4	31:58		2945	12110	< 2000	< 2000		167	380				2079	36008	75131	146950	310896	3138	
82	5	32:40		16650	167900	< 2000	25288		1263	7036		7501		1556						
151	6	32:43		130398	1834133	24274	182893		10300	80042	11837	56494		1494						
135	6	33:03		62977	718913	33510	121113		5008	31587	16452	37665		1484						
144	6	33:11		18252	297631	2682	31497		1453	13091	1318	9806		1483						
147	6	33:23		30844	343582	4217	18279		2365	14555	1996	5481		1539						
124	5	33:30		< 2000	22980	6071	< 2000			646	1907			2320						
108	5	33:39		30904	306243	10486	36582		1583	8664	3315	7326		2266						
107	5	33:45												2404						
123	5	33:53											2305	2245						
139	6	33:49		333628	4695120	49374	453311		24868	193362	22722	132141		1583						
149	6	33:49											1583	1583						
140	6	34:08		3245	23545	< 2000	< 2000		248	993				1547						
106	5	34:10		86615	747478	38153	131972		4552	21704	12379	27124		2225						
118	5	34:14											2246	2267	36155	75966	144162	299469	2995	
143	6	34:36		15281	183069	4948	22087		1337	8852	2674	7560		1370						
134	6	34:43											1349	1328						
142	6	35:01		17649	88505	35789	73496		1512	4189	18928	24622		1378						
131	6	35:09		< 2000	21033	< 2000	< 2000			1000				1371						
114	5	35:11		< 2000	< 2000	< 2000	< 2000							2372						
133	6	35:14		3573	22283	7134	11899		261	899	3215	3397		1390						
165	6	35:17											1617	1844						
122	5	35:20		142780	135678	25628	22474	interference from INJ cmpd	7521	3949	8334	4630		2241						
188	7	35:22	INJ	392719	380807	67407	52295							1591						
146	6	35:38		58527	567291	20617	89616		3936	21078	8560	23568		1945						
161	6	35:38											1755	1566						
184	7	36:06		3224	3564	< 2000	< 2000		215	132				1767						
153	6	36:17	PRC	overload	overload	overload	overload							1725	27815	53166	107033	212138	2111	
132	6	36:18											1866	2008						
168	6	36:25						shoulder on a large peak						1427						
105	5	36:39		23162	143342	< 2000	23280		1222	4180		4805		2237	31791	68441	133976	277026	2793	
127	5	36:50		< 2000	< 2000	< 2000	< 2000							2339						
179	7	37:28		43453	558256	7324	52369		3109	22071	3236	14655		1649						
141	6	37:31		59947	832419	12821	97565		4710	36133	6219	29976		1502						









Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

16 November 2014

Recovery compound added	**5000** pg
Injection compound added	**5000** pg

Notes: CAL curves for 20 PCB congeners affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
PE extracts are dominated by non-labelled PRCs (~10x higher than targets).
Extract volumes calculated from Injection compound additions appear to be low according to eyeball test.
Site 04 nominal volumes 50µL; Site 01 nominal volumes 200µL.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

Detection limit: ≥ 500 pg/ g PE concentrations for all chlorination groups
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

color code: Values are suspect when comparing H2O and Sediment PE
H2O PE values are suspect - no confirming signal in SED PE

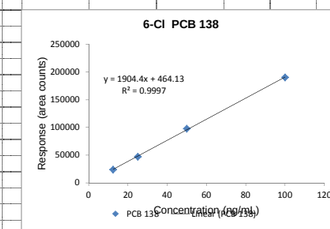
	# Cl	R.T. (**min**)		*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE						
				Site 04	Site 04	Site 01	Site 01						
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**						
Recovery Cmpd													
				AREA COUNTS / µL INJECTED									
13C PCB 19	3	15:35		298404	349702	54985	49942						
13C PCB 52	4	21:48		357921	393238	65024	48061						
13C PCB 105	5	36:39		421414	412516	70455	56742						
13C PCB167	6	41:52		345972	321566	57561	42988						
13C PCB 194	8	55:23		175391	155871	28452	21818						
Injection Cmpd				AREA COUNTS / µL INJECTED									
d17-39	3	21:36		736910	888413	129229	92706						
d22-104	5	22:33		531489	689921	95250	99645						
d34-55	4	27:05		604962	602432	99980	80928						
d40-150	6	29:27		490247	542375	79947	67515						
d52-188	7	35:20		392719	380807	67407	52295						
				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE						
				Site 04	Site 04	Site 01	Site 01						
				1116WW04	**1116WP04**	**1116WW01**	**1116WP01**						
Congener No.	# Cl	R.T. (**min**)		50µL extr.vol.	50µL extr.vol.	200µL extr.vol.	200µL extr.vol.	approximate					
				AREA COUNTS / µL INJECTED									
137	6	38:02		3941	25621	< 2000	< 2000						
176	7	38:13		8740	141729	< 2000	14710						
130	6	38:17		8756	85391	< 2000	11567						
164	6	38:41		122245	1557785	12471	163895						
163	6	38:43											
138	6	38:54		157287	2001609	25536	228064						
160	6	38:54											
158	6	39:02		23471	310011	< 2000	42070						
186	7	39:03		< 2000	< 2000	< 2000	< 2000						
178	7	39:29	PRC	5597636	overload	overload	overload						
129	6	39:33		481842	667243	1582687	3085167						
126	5	40:00		< 2000	< 2000	25553	43583						
175	7	40:04		17325	47032	32630	67481						
166	6	40:11		< 2000	< 2000	< 2000	< 2000						
182	7	40:23		77474	928138	16299	93887						
187	7	40:23											
159	6	40:42		< 2000	< 2000	< 2000	< 2000						
183	7	40:55		30718	383031	8624	44428						
162	6	41:14		< 2000	< 2000	< 2000	< 2000						
128	6	41:31		15620	158736	3209	24647						
167	6	41:52		6883	63495	< 2000	10627						
185	7	42:02		8666	83475	< 2000	12659						
174	7	42:45		49765	659634	10023	69740						
181	7	42:51											
177	7	43:15		29466	359451	6110	40862						
202	8	43:31		-	-	-	-	cutoff switching ion groups					
171	7	43:45		10384	146105	< 2000	18552						
156	6	44:06		12994	141023	< 2000	20095						
173	7	44:16		< 2000	14279	< 2000	< 2000						
201	8	44:21		< 2000	32312	< 2000	4967						
157	6	44:33		< 2000	< 2000	< 2000	< 2000						
204	8	44:36		< 2000	9007	< 2000	< 2000						
192	7	44:56		7560	76770	< 2000	10159						
172	7	45:02											
197	8	45:12		< 2000	11851	< 2000	< 2000						
180	7	45:45		93810	1211894	16760	117200						
193	7	45:48											
191	7	46:13		< 2000	27533	< 2000	< 2000						
200	8	46:50		< 2000	27800	< 2000							
169	6	48:03		< 2000	< 2000	< 2000	< 2000						
170	7	48:39		37829	503737	9084	53656						
190	7	48:39											
198	8	49:05		< 2000	10933	4397	10016						
199	8	49:23		12859	124361	4270	12488						
203	8	50:01		12184	146031	6121	15880						
196	8	50:03											
189	7	51:49		< 2000	17666	< 2000	< 2000						

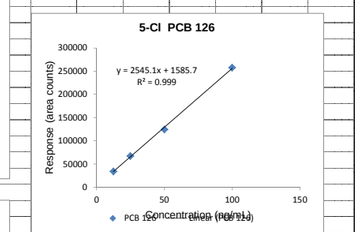
	in situ PE	*in situ* PE	*in situ* PE	*in situ* PE	
	Site 04	Site 04	Site 01	Site 01	
	1116WW04	**1116WP04**	**1116WW01**	**1116WP01**	
	Site 04	Site 04	Site 01	Site 01	
	1116WW04	**1116WP04**	**1116WW01**	**1116WP01**	
	pg/g PE Recovery Corrected				
AVE fraction recov'd	0.83	0.77	0.84	0.81	
AVE. Calc'd Vol (uL)	20	18	118	144	
	20	16	112	156	
	20	15	111	106	
	21	21	126	156	
	20	18	125	148	
	20	21	118	152	
	299	1074			
	626	5610		4121	
	748	4029		3863	
	7258	51098	4571	38052	
	10928	76837	10954	61968	
	1352	9863		9474	
	541646				
	40915	31304	829719	1024498	
			9348	10099	
	1637	2456	19038	24940	
	6687	44263	8686	31692	
	2654	18281	4599	15009	
	1267	7113	1607	7818	
	410	2091		2478	
	778	4139		4443	
	4566	33436	5677	25021	
	2928	19735	3749	15880	
	1010	7853		7058	
	816	4894		4936	
		830			
		1336		1454	
		382			
	660	3705		3470	
		468			
	7527	53728	8303	36778	
		1153			
		1173			
	3364	24750	4987	18660	
		649	2916	4207	
	1328	7099	2724	5045	
	1199	7939	3718	6110	
		840			

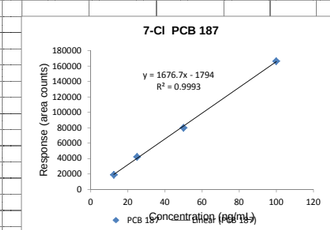
	Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)
		1556
		1648
		1382
		1949
	1988	2028
		1947
	1699	1450
		2050
		1687
		1220
		1390
		1992
		1249
		1920
		1337
	1367	1398
		1918
		1366
		2015
		1455
		1980
		1315
		1244
	1287	1329
		1188
		0
		1213
		1879
		1121
		1577
		1915
		1536
		1525
	1351	1178
		1651
		1308
	1471	1633
		1557
		1545
		1654
		1327
	1327	1327
		1099
		1142
		1250
	1200	1149
		1372

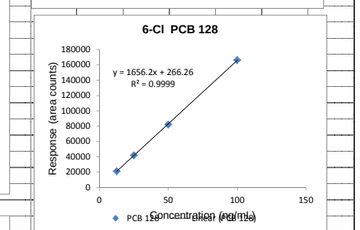
Ultra Scientific EPA Congener Calibration Check Solution

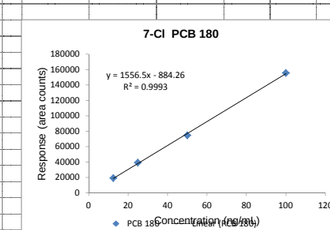
	1116EPA	**1116EPA1**	**1116EPA2**	**1116EPA3**
12.5	25	50	100	
pg/µL				
23921	47184	97630	190199	1904
34278	67215	124304	257758	2545
18823	41977	79857	166545	1677
21308	41851	82208	166227	1656
19058	39086	74502	155658	1556
16062	35670	66276	134031	1335

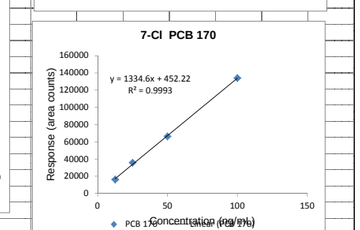












Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

16 November 2014

Recovery compound added	**5000** pg
Injection compound added	**5000** pg

Notes: CAL curves for 20 PCB congeners affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
PE extracts are dominated by non-labelled PRCs (~10x higher than targets).
Extract volumes calculated from Injection compound additions appear to be low according to eyeball test.
Site 04 nominal volumes 50µL; Site 01 nominal volumes 200µL.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

Detection limit: ≥ 500 pg/ g PE concentrations for all chlorination groups
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

color code: Values are suspect when comparing H2O and Sediment PE
H2O PE values are suspect - no confirming signal in SED PE

	# Cl	R.T. (min)	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE
			Site 04	Site 04	Site 01	Site 01
			1116WW04	**1116WP04**	**1116WW01**	**1116WP01**
Recovery Cmpd						
			AREA COUNTS / µL INJECTED			
13C PCB 19	3	15:35	298404	349702	54985	49942
13C PCB 52	4	21:48	357921	393238	65024	48061
13C PCB 105	5	36:39	421414	412516	70455	56742
13C PCB167	6	41:52	345972	321566	57561	42988
13C PCB 194	8	55:23	175391	155871	28452	21818
Injection Cmpd			AREA COUNTS / µL INJECTED			
d17-39	3	21:36	736910	888413	129229	92706
d22-104	5	22:33	531489	689921	95250	99645
d34-55	4	27:05	604962	602432	99980	80928
d40-150	6	29:27	490247	542375	79947	67515
d52-188	7	35:20	392719	380807	67407	52295

	in situ PE	*in situ* PE	*in situ* PE	*in situ* PE
	Site 04	Site 04	Site 01	Site 01
	1116WW04	**1116WP04**	**1116WW01**	**1116WP01**
AVE fraction recov'd	0.83	0.77	0.84	0.81
AVE. Calc'd Vol (uL)	20	18	118	144

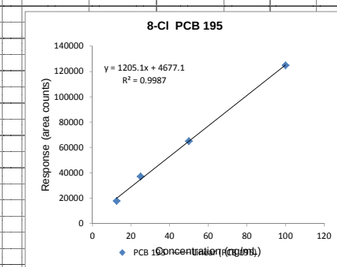
	in situ PE	*in situ* PE	*in situ* PE	*in situ* PE
	Site 04	Site 04	Site 01	Site 01
	1116WW04	**1116WP04**	**1116WW01**	**1116WP01**
13C PCB 19	0.77	0.83	0.84	0.92
13C PCB 52	0.86	0.86	0.92	0.82
13C PCB 105	0.88	0.78	0.86	0.84
13C PCB167	0.87	0.73	0.85	0.77
13C PCB 194	0.78	0.63	0.74	0.69
d17-39	20	16	112	156
d22-104	20	15	111	106
d34-55	21	21	126	156
d40-150	20	18	125	148
d52-188	20	21	118	152
AVE. Calc'd Vol (uL)	20	18	118	144

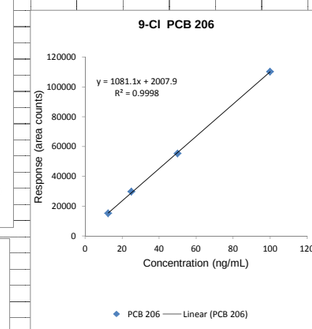
Congener No.	# Cl	R.T. (min)	*in situ* PE Site 04 **1116WW04** 50µL extr.vol.	*in situ* PE Site 04 **1116WP04** 50µL extr.vol.	*in situ* PE Site 01 **1116WW01** 200µL extr.vol.	*in situ* PE Site 01 **1116WP01** 200µL extr.vol.	approximate
			AREA COUNTS / µL INJECTED				
208	9	52:52	< 2000	3179	< 2000	< 2000	
195	8	53:04	5722	52426	< 2000	6541	
207	9	53:49	< 2000	3934	< 2000	< 2000	
194	8	55:23	9316	93391	< 2000	10900	
205	8	55:46	< 2000	10549	< 2000	< 2000	
206	9	59:05	< 2000	14162	< 2000	< 2000	
209	10	62:13	< 2000	< 2000	< 2000	< 2000	
			PE Site 4 H2O side	**PE Site 4** Sed side	**PE Site 1** H2O side	**PE Site 1** Sed side	
		run time	21:50	23:00	01:21	02:31	
		run date	16 Nov	16 Nov	17 Nov	17 Nov	

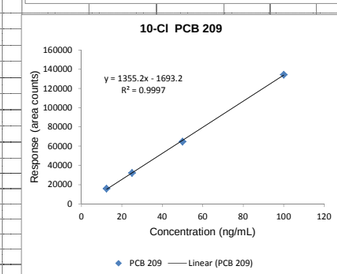
	PE Site 4 H2O side	**PE Site 4** Sed side	**PE Site 1** H2O side	**PE Site 1** Sed side
PE dry wgt.	0.2057	0.3677	0.1934	0.3851
	pg/g PE Recovery Corrected			
208		159		
195	649	3287		2903
207		165		
194	1004	5559		4593
205		562		
206		1039		
209				

Congener No.	Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)	Ultra Scientific EPA Congener Calibration Check Solution 12.5 pg/µL **1116EPA**	25 **1116EPA1**	50 **1116EPA2**	100 **1116EPA3**
208		1301				
195		1040	17834	37017	64949	124862
207		1559				
194		1096				
205		1223				
206		889	15269	29805	55356	110317
209		1057	15947	32298	64678	134410
run time			14:48	15:58	17:09	18:19
run date			16 Nov	16 Nov	16 Nov	16 Nov

Rec/Inj cmpds				1116REIN	1116RIN2	
100pg/uL						Ave. r.f.
13C PCB 19	3	15:35		154012	156931	1555
13C PCB 52	4	21:48		167044	168665	1679
13C PCB 105	5	36:39		199578	188263	1939
13C PCB 167	6	41:52		170459	151392	1609
13C PCB 194	8	55:23		104568	77910	912
			run time	13:38	00:11	
			run date	16 Nov	17 Nov	







GC/MS Analysis Sequence
(19 November 2014)

Lower Willamette RM11 East Project									19 November 2014							
Client:	SEE, LLC															
MIT Project Number: 6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.													
Run time	**MIT data file**					Notes:	19 Nov 2014 - Analyzing diluted PE extracts, rerunning the 5 Accustandard PCB									
							mixtures and analyzing Sediment extracts and blanks.									
07:48	1119HEX	JT Baker Ultra hexane					Confirming single point r.f's with the 20 compound PCB standard at 2 different concentrations.									
08:58	1119REIN	Recovery/Injection cmpds		100ng/mL			Analyzing 13C Recovery compounds and rare PCB congener Injection compounds for extract calculations.									
10:08	1119WW04	**PE Site 4, WW**		dilute												
11:19	1119WP04	**PE Site 4, WP**		dilute												
12:29	1119RIN2	Recovery/Injection cmpds		100ng/mL												
13:39	1119EPA	Ultra Sci. EPA Cal cmpds		50 ng/mL												
14:50	1119HEX1	JT Baker Ultra hexane														
16:00	1119WW01	**PE Site 1, WW**		dilute												
17:11	1119WP01	**PE Site 1, WP**		dilute												
18:27	1119EPA1	Ultra Sci. EPA Cal cmpds		100 ng/mL												
19:37	1119PCB1	Accustandard PCB Mix #1		200 ng/mL												
20:48	1119PCB2	Accustandard PCB Mix #2		200 ng/mL												
21:58	1119PCB3	Accustandard PCB Mix #3		200 ng/mL												
23:08	1119PCB4	Accustandard PCB Mix #4		200 ng/mL												
00:19	1119PCB5	Accustandard PCB Mix #5		200 ng/mL												
01:29	1119HEX2	JT Baker Ultra hexane														
02:39	1119ASIN	Inj. Std. ASE Sediment extr.		100 ng/mL												
03:50	1119ASYS	ASE System blank														
05:00	1119ASOL	ASE Solvent blank														
06:10	1119ASND	ASE Ottawa Sand blank														
07:21	1119SEDA	**Willamette Sediment Site 1**		1mL extr.vol.	rerun concentrated											
08:35	1119ASI1	Inj. Std. ASE Sediment extr.		100 ng/mL												
09:52	1119SED4	**Willamette Sediment Site 4**														
11:02	1119EP1A	Ultra Sci. EPA Cal cmpds		100 ng/mL												
12:21	1119SEDA	**Willamette Sediment Site 1A**		0.2mL extr.vol.												
13:23	1119SEDB	**Willamette Sediment Site 1B**		0.2mL extr.vol.												
14:34	1119EPA2	Ultra Sci. EPA Cal cmpds		50 ng/mL												
15:44	1119HEX3	JT Baker Ultra hexane														

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
2	1							1	**r.f. (area cts/pg)**			
1	1							1				
3	1			1								
4	2	12:55						196638	1966			
10	2	12:55		297876					2979			
7	2	13:57			291480				2915			
9	2	13:57		307934					3079			
6	2	14:24		302896					3029			
5	2	14:42			287673				2877			Method 8082
8	2	14:43		319393					3194	Ultra Sci. EPA calibration cmpd		
14	2	15:22		304402					3044			
19	3	15:35						145941	1459			
30	3	15:59		213980					2140			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
11	2	16:24		281847					2818			
12	2	16:43			298034				2980			
18	3	16:45			152412				1524	Ultra Sci. EPA calibration cmpd		Method 8082
13	2	16:46				226517			2265			
17	3	16:52				151211			1512			
15	2	17:07						304549	3045			
27	3	17:16		217276					2173			
24	3	17:20			215438				2154			
16	3	17:48						128689	1287			
32	3	17:50		228332					2283			
34	3	18:17		224172					2242			
23	3	18:22			217521				2175			
29	3	18:35				217541			2175			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
54	4	18:37	PRC					391352	1957			
26	3	18:58		230000					2300			
25	3	19:04					184137		1841			
50	4	19:19		311758					1559			
31	3	19:32		239240					2392			Method 8082
28	3	19:35	PRC		225456				2255	Ultra Sci. EPA calibration cmpd		
21	3	20:04					176925		1769			
20	3	20:06				197624			1976			
33	3	20:07		224874					2249			
53	4	20:04			309674				1548			
51	4	20:25			316506				1583			
22	3	20:39			219231				2192			
45	4	20:54		284211					1421			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
36	3	21:06		232305					2323			
46	4	21:24				252807			1264			
69	4	21:32					314202		1571			
73	4	21:36			392767				1964			
39	3	21:43	INJ		225227				2252			
52	4	21:48		317576					1588	Ultra Sci. EPA calibration cmpd		Method 8082
43	4	21:54						261958	1310			
49	4	22:06		332427					1662			
48	4	22:16			316474				1582			
47	4	22:18	PRC				289375		1447			
75	4	22:18		444961					2225			
38	3	22:19		231606					2316			
65	4	22:26				374940			1875			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
62	4	22:33			394743				1974			
104	5	22:51	INJ					384041	1920			
35	3	23:09		208783					2088			
44	4	23:13						268004	1340	Ultra Sci. EPA calibration cmpd		Method 8082
59	4	23:21				373009			1865			
42	4	23:28					248869		1244			
37	3	23:45						196642	1966			
72	4	23:58		432078					2160			
71	4	24:00			420717				2104			
41	4	24:08		302804					1514			
64	4	24:11					355223		1776			
68	4	24:13			430376				2152			
96	5	24:29		375072					1875			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
103	5	24:40		314023					1570			
40	4	24:42				225087			1125			
57	4	24:55		422065					2110			
100	5	25:09			302402				1512			
67	4	25:17				391634			1958			
58	4	25:26			410213				2051			
94	5	25:39			267045				1335			
63	4	25:44		428837					2144			
61	4	25:58			371601				1858			
74	4	26:04						386196	1931			
98	5	26:16						261445	1307			
102	5	26:16					249331		1247			
76	4	26:19				366684			1833			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
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13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
70	4	26:26					347143		1736			
93	5	26:26				241564			1208			
95	5	26:33		291660					1458			
121	5	26:34			365091				1825			
66	4	26:38		440835					2204	Ultra Sci. EPA calibration cmpd		Method 8082
80	4	26:40				408813			2044			
88	5	26:46		274612					1373			
91	5	27:05			286189				1431			
55	4	27:18	INJ		400267				2001			
155	6	27:37						344234	1721			
56	4	27:57						401742	2009			
60	4	28:03			413718				2069			
92	5	28:02		270441					1352			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
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13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
84	5	28:18				235466			1177			
90	5	28:27			275595				1378			
89	5	28:29		270110					1351			
101	5	28:34				287371			1437	Ultra Sci. EPA calibration cmpd		Method 8082
113	5	28:40		355658					1778			
99	5	28:57			310083				1550			
79	4	29:18		407126					2036			
119	5	29:27		394293					1971			
150	**6**	**29:29**	**INJ**		334207				1671			
112	5	29:34				344035			1720			
83	5	29:48		241397					1207			
109	5	29:48			359301				1797			
152	6	30:04		330190					1651			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
78	4	30:09		443224					2216			
97	5	30:18	PRC				232481		1162			
86	5	30:20				242087			1210			
125	5	30:24						362291	1811			
117	5	30:40			364265				1821			
116	5	30:42				333852			1669			
111	5	30:44	PRC		402374				2012			
145	6	30:42			327565				1638			
115	5	30:51					304752		1524			
87	5	30:53		294878					1474			Method 8082
148	6	30:54		248773					1244			
81	4	31:02		393092					1965			
85	5	31:14		695461					1739			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
120	5	31:14		[illegible]					1739			
136	6	31:26		339919					1700			
154	6	31:38				265177			1326			
110	5	31:41						370625	1853			Method 8082
77	4	31:58						366274	1831	Ultra Sci. EPA calibration cmpd		
82	5	32:40		259545					1298			
151	6	32:43		248261					1241			Method 8082
135	6	33:03			234226				1171			
144	6	33:11		258511					1293			
147	6	33:23				231394			1157			
124	5	33:30		377119					1886			
108	5	33:39			352377				1762			
107	5	33:45				351159			1756			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
123	5	33:53					297075		1485			
139	6	33:49			517916				1295			
149	6	33:49							1295			
140	6	34:08				237260			1186			
106	5	34:10		365611					1828			
118	5	34:14			353229				1766	Ultra Sci. EPA calibration cmpd		
143	6	34:36		239816					1199			
134	6	34:43					184902		925			
142	6	35:01		228400					1142			
131	6	35:09					189116		946			
114	5	35:11			370487				1852			
133	6	35:14		234069					1170			
165	6	35:17			308243				1541			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
122	5	35:20		374935					1875			
188	7	35:22	INJ					276542	1383			
146	6	35:38				235978			1180			
161	6	35:38		323969					1620			
184	7	36:06			289538				1448			
153	6	36:17	PRC	292561					1463	Ultra Sci. EPA calibration cmpd		Method 8082
132	6	36:18			318027				1590			
168	6	36:25			242378				1212			
105	5	36:39		354237					1771	Ultra Sci. EPA calibration cmpd		
127	5	36:50		373442					1867			
179	7	37:28		282025					1410			
141	6	37:31				222955			1115			Method 8082
137	6	38:02			247496				1237			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
176	7	38:13		288995					1445			
130	6	38:17		230855					1154			
164	6	38:41				289657			1448			
163	6	38:43					272720		1364			
138	6	38:54						251709	1259	Ultra Sci. EPA calibration cmpd		Method 8082
160	6	38:54			304370				1522			
158	6	39:02				306899			1534			
186	7	39:03			281939				1410			
178	7	39:29	PRC	207547					1038			
129	6	39:33		235385					1177			
126	5	40:00						338240	1691	Ultra Sci. EPA calibration cmpd		
175	7	40:04		213825					1069			
166	6	40:11		324085					1620			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
182	7	40:23				201293			1006			
187	7	40:23			224503				1123	Ultra Sci. EPA calibration cmpd		Method 8082
159	6	40:42		301189					1506			
183	7	40:55		229219					1146			Method 8082
162	6	41:14			309501				1548			
128	6	41:31			225292				1126	Ultra Sci. EPA calibration cmpd		
167	6	41:52		311974					1560			
185	7	42:02			211779				1059			
174	7	42:45				189664			948			
181	7	42:51			213912				1070			
177	7	43:15		194072					970			
202	8	43:31						cut off	0			
171	7	43:45		203416					1017			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
156	6	44:06		302776					1514			
173	7	44:16				165759			829			
201	8	44:21		401450					1338			
157	6	44:33			291172				1456			
204	8	44:36		382907					1276			
192	7	44:56			237954				1190			
172	7	45:02		190946					955			
197	8	45:12			389615				1299			
180	7	45:45					176727		884	Ultra Sci. EPA calibration cmpd		Method 8082
193	7	45:48				236318			1182			
191	7	46:13		245163					1226			
200	8	46:50		390089					1300			
169	6	48:03						265448	1327			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
170	7	48:39		865696					2164	Ultra Sci. EPA calibration cmpd		Method 8082
190	7	48:39							2164			
198	8	49:05		271842					906			
199	8	49:23			278820				929			
203	8	50:01			296215				987			
196	8	50:03		283854					946			
189	7	51:49						223957	1120			
208	9	52:52						336684	1122			
195	8	53:04		271971					907	Ultra Sci. EPA calibration cmpd		
207	9	53:49		339406					1131			
194	8	55:23		274881					916			
205	8	55:46						316645	1055			
206	9	59:05						238099	794	Ultra Sci. EPA calibration cmpd		Method 8082

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
209	10	62:13						296354	988	Ultra Sci. EPA calibration cmpd		
				119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5				
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5				
		congener count		81	53	29	15	27				
				2 coelutions	1 coelution			1 missed ion				
				PCB 85,120	PCB 138,149			PCB 202				
				PCB 170,190								

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MIT Project Number: 6931411
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			in situ PE	*in situ* PE	*in situ* PE	*in situ* PE		Recovery compound added		**5000** pg						Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners														
			Site 04	Site 04	Site 01	Site 01		Injection compound added		**5000** pg							**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**														
		R.T.	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**											PE extracts are diluted in order to quantitate PRCs.														
Recovery Cmpd	# Cl	(min)															Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.														
			AREA COUNTS / µL INJECTED										r.f. (area/pg)				Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.														
13C PCB 19	3	15:35	7774	7704	-	-			1.21	1.15	-	-	1070																		
13C PCB 52	4	21:48	7379	7208	1411	1420			1.05	0.99	1.07	0.98	1169																		
13C PCB 105	5	36:39	8513	8777	1908	1537			1.03	1.02	1.23	0.90	1379			sample calculation:	[area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]														
13C PCB167	6	41:52	7928	7991	1587	1680			1.06	1.02	1.13	1.08	1249																		
13C PCB 194	8	55:23	5183	4502	1037	760			1.07	0.89	1.14	0.76	806																		
								AVE fraction recov'd	1.08	1.02	1.14	0.93				Detection limit:	≥ 5000 pg/ g PE														
Injection Cmpd			AREA COUNTS / µL INJECTED										r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.														
d17-39	3	21:36	12488	12742	2318	3228			902	884	4858	3489	2252				Congener response factor variations and masses of PE result in variations in the MDL.														
d22-104	5	22:33	13121	14464	2167	3199			732	664	4431	3001	1920																		
d34-55	4	27:05	11068	11044	1894	1808			904	906	5283	5535	2001																		
d40-150	6	29:27	10251	11641	2125	1988			815	718	3932	4203	1671																		
d52-188	7	35:20	8527	8340	1885	1765			811	829	3668	3917	1383																		
								AVE. Calc'd Vol (uL)	833	800	4434	4029																			
			in situ PE	*in situ* PE	*in situ* PE	*in situ* PE																									
			Site 04	Site 04	Site 01	Site 01			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE				Ultra Scientific EPA Congener Calibration Check Solution															
		R.T.	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**			Site 04	Site 04	Site 01	Site 01		Accustandard		50	100	100	50												
Congener No.	# Cl	(min)	1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**	Coelution	PCB mixes		pg/µL					EPA Average									
			AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**				AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)										
2	1																														
1	1																														
3	1																														
4	2	12:55	< 2000	168950	< 2000	10298				146470		46844		1966																	
10	2	12:55											2473	2979																	
7	2	13:57	< 2000	< 2000	< 2000	< 2000								2915																	
9	2	13:57											2997	3079																	
6	2	14:24	< 2000	< 2000	< 2000	< 2000								3029																	
5	2	14:42	< 2000	15796	< 2000	< 2000				11155				2877																	
8	2	14:43											3035	3194		133390	269081	280218	141485		2748										
14	2	15:22	< 2000	< 2000	< 2000	< 2000								3044																	
19	3	15:35	< 2000	238490	< 2000	17365				350294		133828		1459																	
30	3	15:59	< 2000	< 2000	< 2000	4214						22150		2140																	
11	2	16:24	< 2000	< 2000	< 2000	< 2000								2818																	
12	2	16:43	< 2000	< 2000	< 2000	< 2000								2980																	
18	3	16:45	< 2000	13951	< 2000	2461				19621		18161		1524		69916	134538	147492	73166		1420										
13	2	16:46	< 2000	< 2000	< 2000	< 2000								2265																	
17	3	16:52	1147	68737	< 2000	5966			2834	97442		44376		1512																	
15	2	17:07	< 2000	< 2000	< 2000	10471						38671		3045																	
27	3	17:16	< 2000	28417	< 2000	3621				28154		18824		2173																	
24	3	17:20											2164	2154																	
16	3	17:48	< 2000	52162	< 2000	3676				62637		23161		1287																	
32	3	17:50											1785	2283																	
34	3	18:17	< 2000	< 2000	< 2000	< 2000								2242																	
23	3	18:22											2208	2175																	
29	3	18:35	< 2000	8660	< 2000	< 2000				8533				2175																	
54	4	18:37	PRC 2560	210020	43347	824899			4888	230071	445004	4741474		1957																	
26	3	18:58	< 2000	9133	< 2000	6635				9455		36039		2300																	
25	3	19:04											2071	1841																	
50	4	19:19	< 2000	6652	< 2000	< 2000				9148				1559																	
31	3	19:32	3371	293933	62869	1838260			5420	271175	543551	8898528		2392																	
28	3	19:35	PRC										2323	2255		98323	198060	215261	109970		2075										
21	3	20:04												1769																	
20	3	20:06	< 2000	15542	< 2000	12681				15654		67017		1976																	
33	3	20:07											2128	2249																	
53	4	20:04	2834	136635	< 2000	< 2000			6838	189159				1548																	
51	4	20:25	3668	125470	< 2000	8007			8659	169953		56907		1583																	
22	3	20:39	< 2000	< 2000	< 2000	< 2000								2192																	
45	4	20:54	< 2000	< 2000	< 2000	< 2000								1421																	
36	3	21:06	< 2000	< 2000	< 2000	< 2000								2323																	
46	4	21:24	< 2000	6377	< 2000	< 2000				10814				1264																	
69	4	21:32	< 2000	10628	< 2000	< 2000				12890				1571																	
73	4	21:36	< 2000		< 2000	< 2000							1767	1964																	
39	3	21:43	INJ 12488	12742	2318	3228								2252																	
52	4	21:48	4001	106379	< 2000	12341			9413	143608		87414		1588		67228	137666	149074	74358		1425										
43	4	21:54	< 2000	< 2000	< 2000	< 2000								1310																	
49	4	22:06	4769	120447	< 2000	20539			10719	155335		138983		1662																	

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				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE		Recovery compound added		**5000**	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners															
				Site 04	Site 04	Site 01	Site 01		Injection compound added		**5000**	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**															
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**											PE extracts are diluted in order to quantitate PRCs.															
Recovery Cmpd	# Cl	(min)																Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.															
				AREA COUNTS / µL INJECTED											r.f. (area/pg)			Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.															
13C PCB 19	3	15:35		7774	7704	-	-			1.21	1.15	-	-		1070																		
13C PCB 52	4	21:48		7379	7208	1411	1420			1.05	0.99	1.07	0.98		1169																		
13C PCB 105	5	36:39		8513	8777	1908	1537			1.03	1.02	1.23	0.90		1379			sample calculation:	[area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]														
13C PCB167	6	41:52		7928	7991	1587	1680			1.06	1.02	1.13	1.08		1249																		
13C PCB 194	8	55:23		5183	4502	1037	760			1.07	0.89	1.14	0.76		806																		
									AVE fraction recov'd	1.08	1.02	1.14	0.93					Detection limit:	≥ 5000 pg/ g PE														
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.														
d17-39	3	21:36		12488	12742	2318	3228			902	884	4858	3489		2252				Congener response factor variations and masses of PE result in variations in the MDL.														
d22-104	5	22:33		13121	14464	2167	3199			732	664	4431	3001		1920																		
d34-55	4	27:05		11068	11044	1894	1808			904	906	5283	5535		2001																		
d40-150	6	29:27		10251	11641	2125	1988			815	718	3932	4203		1671																		
d52-188	7	35:20		8527	8340	1885	1765			811	829	3668	3917		1383																		
									AVE. Calc'd Vol (uL)	833	800	4434	4029																				
				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE																										
				Site 04	Site 04	Site 01	Site 01			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE					Ultra Scientific EPA Congener Calibration Check Solution															
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**			Site 04	Site 04	Site 01	Site 01			Accustandard		50	100	100	50												
Congener No.	# Cl	(min)		1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		Coelution	PCB mixes		pg/µL					EPA Average									
				AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)									
48	4	22:16														1582																	
47	4	22:18	PRC	25838	410868	139658	1458572			55116	502885	1601900	9367098			1447																	
75	4	22:18													1751	2225																	
38	3	22:19		< 2000	< 2000	< 2000	< 2000									2316																	
65	4	22:26		< 2000	< 2000	< 2000	< 2000									1875																	
62	4	22:33		< 2000	< 2000	< 2000	< 2000									1974																	
104	5	22:51	INJ	13121	14464	2167	3199									1920																	
35	3	23:09		< 2000	< 2000	< 2000	< 2000									2088																	
44	4	23:13		< 2000	10863	< 2000	2017				17377		16930			1340		59339	121685	129094	65564		1251										
59	4	23:21		< 2000	< 2000	< 2000	< 2000									1865																	
42	4	23:28		< 2000	5164	< 2000	< 2000				8896					1244																	
37	3	23:45		< 2000	< 2000	< 2000	< 2000									1966																	
72	4	23:58		< 2000	23279	< 2000	2305				23406		12160			2160																	
71	4	24:00													2132	2104																	
41	4	24:08														1514																	
64	4	24:11		< 2000	7114	< 2000	< 2000				8406					1776																	
68	4	24:13													1814	2152																	
96	5	24:29		< 2000	11490	< 2000	< 2000				13133					1875																	
103	5	24:40		< 2000	12510	< 2000	< 2000				17079					1570																	
40	4	24:42		< 2000	< 2000	< 2000	< 2000									1125																	
57	4	24:55		< 2000	< 2000	< 2000	1686						8986			2110																	
100	5	25:09		2185	20161	< 2000	< 2000			5399	28582					1512																	
67	4	25:17		< 2000	< 2000	< 2000	< 2000									1958																	
58	4	25:26		< 2000	< 2000	< 2000	< 2000									2051																	
94	5	25:39		< 2000	6544	< 2000	< 2000				10506					1335																	
63	4	25:44		< 2000	< 2000	< 2000	< 2000									2144																	
61	4	25:58		< 2000	< 2000	< 2000	< 2000									1858																	
74	4	26:04		< 2000	< 2000	< 2000	< 2000									1931																	
98	5	26:16		< 2000	7227	< 2000	< 2000				12132					1307																	
102	5	26:16													1277	1247																	
76	4	26:19		< 2000	< 2000	< 2000	< 2000									1833																	
70	4	26:26		< 2000	9954	< 2000	< 2000				12293					1736																	
93	5	26:26		< 2000	< 2000	< 2000	< 2000									1208																	
95	5	26:33		5645	107735	< 2000	10781			12844	140655		73853			1458																	
121	5	26:34													1642	1825																	
66	4	26:38		< 2000	6913	< 2000	1350				6976		7148			2204		83794	178074	187441	95438		1810										
80	4	26:40													2124	2044																	
88	5	26:46		< 2000	< 2000	< 2000	< 2000									1373																	
91	5	27:05		3091	32428	< 2000	3265			8070	48578		25663			1431																	
55	4	27:18	INJ	11068	11044	1894	1808									2001																	
155	6	27:37		< 2000	< 2000	< 2000	< 2000									1721																	
56	4	27:57		< 2000	4062	< 2000	3013				4271		16623			2009																	
60	4	28:03													2039	2069																	
92	5	28:02		< 2000	14339	< 2000	< 2000				22731					1352																	
84	5	28:18		< 2000	8024	< 2000	< 2000				14609					1177																	
90	5	28:27														1378																	
89	5	28:29		6930	93799	< 2000	11474			18646	144812		92946			1351																	

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				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE		Recovery compound added		**5000**	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners															
				Site 04	Site 04	Site 01	Site 01		Injection compound added		**5000**	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**															
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**											PE extracts are diluted in order to quantitate PRCs.															
Recovery Cmpd	# Cl	(min)																Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.															
				AREA COUNTS / µL INJECTED											r.f. (area/pg)			Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.															
13C PCB 19	3	15:35		7774	7704	-	-			1.21	1.15	-	-		1070																		
13C PCB 52	4	21:48		7379	7208	1411	1420			1.05	0.99	1.07	0.98		1169																		
13C PCB 105	5	36:39		8513	8777	1908	1537			1.03	1.02	1.23	0.90		1379			sample calculation:	[area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]														
13C PCB167	6	41:52		7928	7991	1587	1680			1.06	1.02	1.13	1.08		1249																		
13C PCB 194	8	55:23		5183	4502	1037	760			1.07	0.89	1.14	0.76		806																		
									AVE fraction recov'd	1.08	1.02	1.14	0.93					Detection limit:	≥ 5000 pg/ g PE														
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.														
d17-39	3	21:36		12488	12742	2318	3228			902	884	4858	3489		2252				Congener response factor variations and masses of PE result in variations in the MDL.														
d22-104	5	22:33		13121	14464	2167	3199			732	664	4431	3001		1920																		
d34-55	4	27:05		11068	11044	1894	1808			904	906	5283	5535		2001																		
d40-150	6	29:27		10251	11641	2125	1988			815	718	3932	4203		1671																		
d52-188	7	35:20		8527	8340	1885	1765			811	829	3668	3917		1383																		
									AVE. Calc'd Vol (uL)	833	800	4434	4029																				
				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE																										
				Site 04	Site 04	Site 01	Site 01			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE					Ultra Scientific EPA Congener Calibration Check Solution															
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**			Site 04	Site 04	Site 01	Site 01			Accustandard		50	100	100	50												
Congener No.	# Cl	(min)		1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		Coelution	PCB mixes		pg/µL					EPA Average									
				AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**	r.f. (area cts/pg)											
101	5	28:34													1388	1437		63326	128732	145393	69428	1349											
113	5	28:40		< 2000	< 2000	< 2000	< 2000									1778																	
99	5	28:57		3026	19511	< 2000	3898			7291	26976		28278			1550																	
79	4	29:18		< 2000	< 2000	< 2000	< 2000									2036																	
119	5	29:27		< 2000	8390	< 2000	< 2000				9122					1971																	
150	**6**	**29:29**	**INJ**	10251	11641	2125	1988									1671																	
112	5	29:34		< 2000	< 2000	< 2000	< 2000									1720																	
83	5	29:48		< 2000	< 2000	< 2000	< 2000									1207																	
109	5	29:48													1502	1797																	
152	6	30:04		< 2000	< 2000	< 2000	< 2000									1651																	
78	4	30:09		< 2000	< 2000	< 2000	< 2000									2216																	
97	5	30:18	PRC													1162																	
86	5	30:20		65250	261622	368659	1680344			174772	402080	5309654	13550250			1210																	
125	5	30:24													1395	1811																	
117	5	30:40														1821																	
116	5	30:42		179975	399241	901402	2698009			366579	466594	9872466	16544677			1669																	
111	5	30:44	PRC												1834	2012																	
145	6	30:42		< 2000	< 2000	< 2000	< 2000									1638																	
115	5	30:51		< 2000	15453	< 2000	< 2000				22097					1524																	
87	5	30:53													1499	1474																	
148	6	30:54		< 2000	< 2000	< 2000	< 2000									1244																	
81	4	31:02		< 2000	< 2000	< 2000	< 2000									1965																	
85	5	31:14		< 2000	< 2000	< 2000	< 2000									1739																	
120	5	31:14													1739	1739																	
136	6	31:26		2748	34011	< 2000	3928			6040	42896		25994			1700																	
154	6	31:38		< 2000	2381	< 2000	< 2000				3849					1326																	
110	5	31:41		4342	59988	< 2000	10295			8753	69390		62484			1853																	
77	4	31:58		< 2000	< 2000	< 2000	< 2000									1831		82225	159698	186977	89631	1726											
82	5	32:40		< 2000	4831	< 2000	< 2000				7980					1298																	
151	6	32:43		3215	36362	< 2000	5916			9676	62793		53604			1241																	
135	6	33:03		< 2000	16016	< 2000	3365				29315		32317			1171																	
144	6	33:11		< 2000	5136	< 2000	1074				8518		9346			1293																	
147	6	33:23		< 2000	7349	< 2000	< 2000				13616					1157																	
124	5	33:30		< 2000	< 2000	< 2000	< 2000									1886																	
108	5	33:39		< 2000	7074	< 2000	< 2000				9093					1762																	
107	5	33:45														1756																	
123	5	33:53													1668	1485																	
139	6	33:49		6952	98118	< 2000	12771			20059	162439		110937			1295																	
149	6	33:49													1295	1295																	
140	6	34:08		< 2000	< 2000	< 2000	< 2000									1186																	
106	5	34:10		3274	17773	< 2000	3996			6806	21200		25009			1828																	
118	5	34:14													1797	1766		81465	163852	180841	90267	1720											
143	6	34:36		< 2000	4386	< 2000	< 2000				8855					1199																	
134	6	34:43													1062	925																	
142	6	35:01		< 2000	2186	< 2000	2074				4103		20426			1142																	
131	6	35:09		< 2000	< 2000	< 2000	< 2000									946																	
114	5	35:11		< 2000	< 2000	< 2000	< 2000									1852																	

PE Quantification
Diluted Extract Run
November 19, 2014

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Gu Polyethylene measures for stations PW001 and PW004.

19 November 2014

				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE		Recovery compound added		**5000**	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners														
				Site 04	Site 04	Site 01	Site 01		Injection compound added		**5000**	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**														
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**											PE extracts are diluted in order to quantitate PRCs.														
Recovery Cmpd	# Cl	(min)																Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.														
				AREA COUNTS / µL INJECTED											r.f. (area/pg)			Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.														
13C PCB 19	3	15:35		7774	7704	-	-			1.21	1.15	-	-		1070																	
13C PCB 52	4	21:48		7379	7208	1411	1420			1.05	0.99	1.07	0.98		1169																	
13C PCB 105	5	36:39		8513	8777	1908	1537			1.03	1.02	1.23	0.90		1379			sample calculation:	[area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]														
13C PCB167	6	41:52		7928	7991	1587	1680			1.06	1.02	1.13	1.08		1249																	
13C PCB 194	8	55:23		5183	4502	1037	760			1.07	0.89	1.14	0.76		806																	
									AVE fraction recov'd	1.08	1.02	1.14	0.93					Detection limit:	≥ 5000 pg/ g PE													
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.													
d17-39	3	21:36		12488	12742	2318	3228			902	884	4858	3489		2252				Congener response factor variations and masses of PE result in variations in the MDL.													
d22-104	5	22:33		13121	14464	2167	3199			732	664	4431	3001		1920																	
d34-55	4	27:05		11068	11044	1894	1808			904	906	5283	5535		2001																	
d40-150	6	29:27		10251	11641	2125	1988			815	718	3932	4203		1671																	
d52-188	7	35:20		8527	8340	1885	1765			811	829	3668	3917		1383																	
									AVE. Calc'd Vol (uL)	833	800	4434	4029																			
				in situ PE	*in situ* PE	*in situ* PE	*in situ* PE																									
				Site 04	Site 04	Site 01	Site 01			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE					Ultra Scientific EPA Congener Calibration Check Solution														
		R.T.		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**			Site 04	Site 04	Site 01	Site 01			Accustandard		50	100	100	50											
Congener No.	# Cl	(min)		1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		Coelution	PCB mixes		pg/µL					EPA Average									
				AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)									
133	6	35:14		< 2000	< 2000	< 2000	< 2000									1170																
165	6	35:17													1356	1541																
122	5	35:20		< 2000	< 2000	< 2000	< 2000	interference from INJ cmpd								1875																
188	7	35:22	INJ	8527	8340	1885	1765									1383																
146	6	35:38		1317	12732	< 2000	2401			3515	19496		19291			1180																
161	6	35:38													1400	1620																
184	7	36:06		< 2000	< 2000	< 2000	< 2000									1448																
153	6	36:17	PRC	184153	391482	736519	2118334			450694	549747	9692551	15608325			1463		63706	118296	130653	66712		1274									
132	6	36:18													1526	1590																
168	6	36:25		< 2000	22593	< 2000	3513				39962		32604			1212																
105	5	36:39		< 2000	< 2000	< 2000	< 2000									1771		75769	157350	177678	83989		1636									
127	5	36:50		< 2000	< 2000	< 2000	< 2000									1867																
179	7	37:28		< 2000	11619	< 2000	< 2000				17662					1410																
141	6	37:31		< 2000	19732	< 2000	< 2000				37942					1115																
137	6	38:02		< 2000	< 2000	< 2000	< 2000									1237																
176	7	38:13		< 2000	3780	< 2000	< 2000				5608					1445																
130	6	38:17		< 2000	< 2000	< 2000	< 2000									1154																
164	6	38:41		3200	34902	< 2000	5498			8503	53214		43983			1448																
163	6	38:43													1406	1364																
138	6	38:54		3478	44398	< 2000	7482			9346	68458		60533			1259		57051	110291	126446	57971		1167									
160	6	38:54													1390	1522																
158	6	39:02		< 2000	7153	< 2000	< 2000				9992					1534																
186	7	39:03		< 2000	< 2000	< 2000	< 2000									1410																
178	7	39:29	PRC	119127	175510	406976	1152280			428859	362539	7878159	12488829			1038																
129	6	39:33		< 2000	< 2000	< 2000	< 2000									1177																
126	5	40:00		< 2000	< 2000	< 2000	< 2000									1691		69002	143472	159108	79953		1501									
175	7	40:04		< 2000	< 2000	< 2000	< 2000									1069																
166	6	40:11		< 2000	< 2000	< 2000	< 2000									1620																
182	7	40:23		< 2000	22238	< 2000	3673				44781		38809			1006																
187	7	40:23													1064	1123		48554	99134	103709	50904		1004									
159	6	40:42		< 2000	< 2000	< 2000	< 2000									1506																
183	7	40:55		< 2000	9732	< 2000	< 2000				18202					1146																
162	6	41:14		< 2000	< 2000	< 2000	< 2000									1548																
128	6	41:31		< 2000	4647	< 2000	< 2000				8843					1126		51337	99017	111026	52127		1042									
167	6	41:52		< 2000	< 2000	< 2000	< 2000									1560																
185	7	42:02		< 2000	2377	< 2000	< 2000				4812					1059																
174	7	42:45		1148	15345	< 2000	2388			4251	32602		26621			948																
181	7	42:51													1009	1070																
177	7	43:15		< 2000	8677	< 2000	< 2000				19168					970																
202	8	43:31			cutoff switching ion groups			cutoff switching ion groups								0																
171	7	43:45		< 2000	3549	< 2000	< 2000				7480					1017																
156	6	44:06		< 2000	4150	< 2000	< 2000				5876					1514																
173	7	44:16		< 2000	< 2000	< 2000	< 2000									829																
201	8	44:21		< 2000	< 2000	< 2000	< 2000									1338																
157	6	44:33		< 2000	< 2000	< 2000	< 2000									1456																
204	8	44:36		< 2000	< 2000	< 2000	< 2000									1276																
192	7	44:56		< 2000	2222	< 2000	< 2000				4644					1190																

PE Quantification
Diluted Extract Run
November 19, 2014

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Gu Polyethylene measures for stations PW001 and PW004.

19 November 2014

			in situ PE	*in situ* PE	*in situ* PE	*in situ* PE					
			Site 04	Site 04	Site 01	Site 01					
		R.T.	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**					
Recovery Cmpd	# Cl	(min)									
			AREA COUNTS / µL INJECTED								r.f. (area/pg)
13C PCB 19	3	15:35	7774	7704	-	-		1.21	1.15	-	-	1070
13C PCB 52	4	21:48	7379	7208	1411	1420		1.05	0.99	1.07	0.98	1169
13C PCB 105	5	36:39	8513	8777	1908	1537		1.03	1.02	1.23	0.90	1379
13C PCB167	6	41:52	7928	7991	1587	1680		1.06	1.02	1.13	1.08	1249
13C PCB 194	8	55:23	5183	4502	1037	760		1.07	0.89	1.14	0.76	806
							AVE fraction recov'd	1.08	1.02	1.14	0.93	
Injection Cmpd			AREA COUNTS / µL INJECTED									r.f. (area/pg)
d17-39	3	21:36	12488	12742	2318	3228		902	884	4858	3489	2252
d22-104	5	22:33	13121	14464	2167	3199		732	664	4431	3001	1920
d34-55	4	27:05	11068	11044	1894	1808		904	906	5283	5535	2001
d40-150	6	29:27	10251	11641	2125	1988		815	718	3932	4203	1671
d52-188	7	35:20	8527	8340	1885	1765		811	829	3668	3917	1383
							AVE. Calc'd Vol (uL)	833	800	4434	4029	

			in situ PE	*in situ* PE	*in situ* PE	*in situ* PE			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE				Ultra Scientific EPA Congener Calibration Check Solution																
			Site 04	Site 04	Site 01	Site 01			Site 04	Site 04	Site 01	Site 01			Accustandard	50	100	100	50													
		R.T.	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**																										
Congener No.	# Cl	(min)	1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		Coelution	PCB mixes	pg/µL				EPA Average												
			AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					AVE r.f.	r.f. (area cts/pg)	**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**	r.f. (area cts/pg)												
172	7	45:02	< 2000	2925	< 2000	< 2000				4044				1072	955																	
197	8	45:12	< 2000	< 2000	< 2000	< 2000									1299																	
180	7	45:45	2133	28950	< 2000	3728			7717	60097		40606			884	46615	90657	100649	48875	956												
193	7	45:48												1033	1182																	
191	7	46:13	< 2000	< 2000	< 2000	< 2000									1226																	
200	8	46:50	< 2000	< 2000	< 2000	< 2000									1300																	
169	6	48:03	< 2000	< 2000	< 2000	< 2000									1327																	
170	7	48:39	< 2000	13492	< 2000	2070				13363		10758			2164	39060	79087	88490	44064	835												
190	7	48:39												2164	2164																	
198	8	49:05	< 2000	< 2000	< 2000	< 2000									906																	
199	8	49:23	< 2000	3879	< 2000	< 2000				8947					929																	
203	8	50:01	< 2000	5977	< 2000	< 2000				13252					987																	
196	8	50:03												967	946																	
189	7	51:49	< 2000	< 2000	< 2000	< 2000									1120																	
208	9	52:52	< 2000	< 2000	< 2000	< 2000									1122																	
195	8	53:04	< 2000	< 2000	< 2000	< 2000									907	41284	77239	85690	42792	828												
207	9	53:49	< 2000	< 2000	< 2000	< 2000									1131																	
194	8	55:23	< 2000	4498	< 2000	< 2000				10523					916																	
205	8	55:46	< 2000	< 2000	< 2000	< 2000									1055																	
206	9	59:05	< 2000	< 2000	< 2000	< 2000									794	39581	74752	79037	39848	782												
209	10	62:13	< 2000	< 2000	< 2000	< 2000									988	47910	92028	96371	48464	953												
			PE Site 4	**PE Site 4**	**PE Site 1**	**PE Site 1**			**PE Site 4**	**PE Site 4**	**PE Site 1**	**PE Site 1**																				
			H_2O side	Sed side	H_2O side	Sed side			H_2O side	Sed side	H_2O side	Sed side				run time	13:40	18:27	11:02	14:33												
																run date	19 Nov	19 Nov	20 Nov	20 Nov												
		run time	10:08	11:19	16:00	17:11		PE dry wgt.	0.2057	0.3677	0.1934	0.3851																				
		run date	19 Nov	19 Nov	19 Nov	19 Nov																										

			Recovery compound added		**5000**	pg																										
			Injection compound added		**5000**	pg																										

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
PE extracts are diluted in order to quantitate PRCs.
Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.
Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

Detection limit: ≥ 5000 pg/ g PE
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

PE Quantification
Diluted Extract Run
November 19, 2014

Lower Willamette RM11 East Project — 19 November 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Gu: Polyethylene measures for stations PW001 and PW004.

		R.T. (min)	*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE					
			Site 04	Site 04	Site 01	Site 01					
			1119WW04	**1119WP04**	**1119WW01**	**1119WP01**					
Recovery Cmpd	# Cl										
			AREA COUNTS / µL INJECTED								r.f. (area/pg)
13C PCB 19	3	15:35	7774	7704	-	-		1.21	1.15	-	-	1070
13C PCB 52	4	21:48	7379	7208	1411	1420		1.05	0.99	1.07	0.98	1169
13C PCB 105	5	36:39	8513	8777	1908	1537		1.03	1.02	1.23	0.90	1379
13C PCB167	6	41:52	7928	7991	1587	1680		1.06	1.02	1.13	1.08	1249
13C PCB 194	8	55:23	5183	4502	1037	760		1.07	0.89	1.14	0.76	806
							AVE fraction recov'd	1.08	1.02	1.14	0.93	
Injection Cmpd			AREA COUNTS / µL INJECTED									r.f. (area/pg)
d17-39	3	21:36	12488	12742	2318	3228		902	884	4858	3489	2252
d22-104	5	22:33	13121	14464	2167	3199		732	664	4431	3001	1920
d34-55	4	27:05	11068	11044	1894	1808		904	906	5283	5535	2001
d40-150	6	29:27	10251	11641	2125	1988		815	718	3932	4203	1671
d52-188	7	35:20	8527	8340	1885	1765		811	829	3668	3917	1383
							AVE. Calc'd Vol (uL)	833	800	4434	4029	

			in situ PE	*in situ* PE	*in situ* PE	*in situ* PE																									
			Site 04	Site 04	Site 01	Site 01			*in situ* PE	*in situ* PE	*in situ* PE	*in situ* PE					Ultra Scientific EPA Congener Calibration Check Solution														
		R.T.	**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**			Site 04	Site 04	Site 01	Site 01			Accustandard		50	100	100	50											
Congener No.	# Cl	(min)	1mL extr.vol.	1mL extr.vol.	5mL extr.vol.	5mL extr.vol.	volumetric		**1119WW04**	**1119WP04**	**1119WW01**	**1119WP01**		Coelution	PCB mixes		pg/µL					EPA Average									
			AREA COUNTS / µL INJECTED						**pg/g PE Recovery Corrected**					AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)									

											GCMS Analysis Sequence																				
Rec/Inj cmpds				1119REIN	1119RIN1					07:48	1119HEX	JT Baker Ultra hexane																			
100pg/uL						Ave. r.f.				08:58	1119REIN	Recovery/Injection cmpds		100ng/mL																	
13C PCB 19	3	15:35		111218	102687	1070				10:08	1119WW04	PE Site 4, WW		dilute																	
13C PCB 52	4	21:48		118136	115693	1169				11:19	1119WP04	PE Site 4, WP		dilute																	
13C PCB 105	5	36:39		138976	136742	1379				12:29	1119RIN2	Recovery/Injection cmpds		100ng/mL																	
13C PCB 167	6	41:52		129358	120345	1249				13:39	1119EPA	Ultra Sci. EPA Cal cmpds		50 ng/mL																	
13C PCB 194	8	55:23		85115	76171	806				14:50	1119HEX1	JT Baker Ultra hexane																			
										16:00	1119WW01	PE Site 1, WW		dilute																	
				08:58	12:29					17:11	1119WP01	PE Site 1, WP		dilute																	
				19 Nov	19 Nov					18:27	1119EPA1	Ultra Sci. EPA Cal cmpds		100 ng/mL																	
										19:37	1119PCB1	Accustandard PCB Mix #1		200 ng/mL																	
										20:48	1119PCB2	Accustandard PCB Mix #2		200 ng/mL																	
										21:58	1119PCB3	Accustandard PCB Mix #3		200 ng/mL																	
										23:08	1119PCB4	Accustandard PCB Mix #4		200 ng/mL																	
										00:19	1119PCB5	Accustandard PCB Mix #5		200 ng/mL																	
										01:29	1119HEX2	JT Baker Ultra hexane																			
										02:39	1119ASIN	Inj. Std. ASE Sediment extr.		100 ng/mL																	
										03:50	1119ASYS	ASE System blank																			
										05:00	1119ASOL	ASE Solvent blank																			
										06:10	1119ASND	ASE Ottawa Sand blank																			
										07:21	1119SEDA	Willamette Sediment Site 1A		1mL extr.vol.																	
										08:35	1119ASI1	Inj. Std. ASE Sediment extr.		100 ng/mL																	
										09:52	1119SED4	Willamette Sediment Site 4																			
										11:02	1119EP1A	Ultra Sci. EPA Cal cmpds		100 ng/mL																	
										12:21	1119SEDA	Willamette Sediment Site 1A		0.2mL extr.vol.																	
										13:23	1119SEDB	Willamette Sediment Site 1B		0.2mL extr.vol.																	
										14:34	1119EPA2	Ultra Sci. EPA Cal cmpds		50 ng/mL																	
										15:44	1119HEX3	JT Baker Ultra hexane																			

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
PE extracts are diluted in order to quantitate PRCs.
Extract volumes calculated from Injection compound additions are low again according to eyeball test and volumetric flask dilution.
Site 04 nominal volumes 1mL; Site 01 - 5mL volumetric.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [PE (g dry wgt.)]

Detection limit: ≥ 5000 pg/ g PE
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

Recovery compound added	**5000**	pg
Injection compound added	**5000**	pg

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness
1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution			
	2	3	1		0			1			
	1	2	1		0.00			5			
	3	4	1		0.00			5			
1	4	2,2'	2	12:55	12.92	0.438	coelutes #10	5			
1	10	2,6	2	12:55	12.92	0.438	coelutes #4	1			
2	7	2,4	2	13:57	13.95	0.473	coelutes #9	2			
2	9	2,5	2	13:57	13.95	0.473	coelutes #7	1			
3	6	2,3'	2	14:24	14.40	0.488		1			
4	5	2,3	2	14:42	14.70	0.499	coelutes #8	2	confirmed r.t.		Method 8082
4	8	2,4'	2	14:43	14.72	0.499	coelutes #5	1	confirmed r.t.	EPA 20	
4	14	3,5	2	15:22	15.37	0.521		1			
5	19	2,2',6	3	15:35	15.58	0.529		5	confirmed r.t.	13C labelled cmpd	
5	30	2,4,6	3	15:59	15.98	0.542		1			
5	11	3,3'	2	16:24	16.40	0.556		1			
5	12	3,4	2	16:43	16.72	0.567		2			
6	18	2,2',5	3	16:45	16.75	0.568		2	confirmed r.t.	EPA 20	Method 8082
5	13	3,4'	2	16:46	16.77	0.569		3			
6	17	2,2',4	3	16:52	16.87	0.572		3			
6	15	4,4'	2	17:07	17.12	0.581		5			
7	27	2,3',6	3	17:16	17.27	0.586	coelutes #24	1			
7	24	2,3,6	3	17:20	17.33	0.588	coelutes #27	2			
8	16	2,2',3	3	17:48	17.80	0.604		5			
8	32	2,4',6	3	17:50	17.83	0.605		1			
9	34	2',3,5	3	18:17	18.28	0.620	coelutes #23	1			
8	23	2,3,5	3	18:22	18.37	0.623	coelutes #34	2			
10	29	2,4,5	3	18:35	18.58	0.630		3			
9	54	2,2',6,6'	4	18:37	18.62	0.631		5			
11	26	2,3',5	3	18:58	18.97	0.643	coelutes #25	1			
12	25	2,3',4	3	19:04	19.07	0.647	coelutes #26	4			
13	50	2,2',4,6	4	19:19	19.32	0.655		1			
13	31	2,4',5	3	19:32	19.53	0.663	coelutes #28	1	confirmed r.t.		Method 8082
13	28	2,4,4'	3	19:35	19.58	0.664	coelutes #31	2	confirmed r.t.	EPA 20	
14	21	2,3,4	3	20:04	20.07	0.681		4			
14	53	2,2',5,6'	4	20:04	20.07	0.681		2			
14	20	2,3,3'	3	20:06	20.10	0.682	coelutes #33	3			
14	33	2',3,4	3	20:07	20.12	0.682	coelutes #20	1			
15	51	2,2',4,6'	4	20:25	20.42	0.692		2			
15	22	2,3,4'	3	20:39	20.65	0.700		2			
16	45	2,2',3,6	4	20:54	20.90	0.709		1			
15	36	3,3',5	3	21:06	21.10	0.716		1			
17	46	2,2',3,6'	4	21:24	21.40	0.726		3			
18	69	2,3',4,6	4	21:32	21.53	0.730		4			
19	73	2,3',5',6	4	21:36	21.60	0.733		2			
17	39	3,4',5	3	21:43	21.72	0.737		2	confirmed r.t.	Injection cmpd	
19	52	2,2',5,5'	4	21:48	21.80	0.739	coelutes #43	1	confirmed r.t.	EPA 20	Method 8082
20	43	2,2',3,5	4	21:54	21.90	0.743	coelutes #52	5			
20	49	2,2',4,5'	4	22:06	22.10	0.750		1			
21	48	2,2',4,5	4	22:16	22.27	0.755	coelutes #75,47	2			
21	47	2,2',4,4'	4	22:18	22.30	0.756	coelutes #75,48	4			
21	75	2,4,4',6	4	22:18	22.30	0.756	coelutes #48,47	1			
20	38	3,4,5	3	22:19	22.32	0.757		1			
21	65	2,3,5,6	4	22:26	22.43	0.761		3			
21	62	2,3,4,6	4	22:33	22.55	0.765		2			
22	104	2,2',4,6,6'	5	22:51	22.85	0.775		5	confirmed r.t.	Injection cmpd	
22	35	3,3',4	3	23:09	23.15	0.785		1			
23	44	2,2',3,5'	4	23:13	23.22	0.787		5	confirmed r.t.	EPA 20	Method 8082
24	59	2,3,3',6	4	23:21	23.35	0.792		3			
24	42	2,2',3,4'	4	23:28	23.47	0.796		4			
24	37	3,4,4'	3	23:45	23.75	0.806		5			
24	72	2,3',5,5'	4	23:58	23.97	0.813	coelutes #71,41	1			
24	71	2,3',4',6	4	24:00	24.00	0.814	coelutes #72,41	2			
25	41	2,2',3,4	4	24:08	24.13	0.819	coelutes #71,72	1			
25	64	2,3,4',6	4	24:11	24.18	0.820	coelutes #68	4			
25	68	2,3',4,5'	4	24:13	24.22	0.821	coelutes #64	2			
26	96	2,2',3,6,6'	5	24:29	24.48	0.830		1			
27	103	2,2',4,5',6	5	24:40	24.67	0.837		1			
27	40	2,2',3,3'	4	24:42	24.70	0.838		3			
27	57	2,3,3',5	4	24:55	24.92	0.845		1			
28	100	2,2',4,4',6	5	25:09	25.15	0.853		2			
28	67	2,3',4,5	4	25:17	25.28	0.858		3			
28	58	2,3,3',5'	4	25:26	25.43	0.863		2			
30	94	2,2',3,5,6'	5	25:39	25.65	0.870		2			
29	63	2,3,4',5	4	25:44	25.73	0.873		1			
30	61	2,3,4,5	4	25:58	25.97	0.881		2			
30	74	2,4,4',5	4	26:04	26.07	0.884		5			
31	98	2,2',3',4,6	5	26:16	26.27	0.891		5			
31	102	2,2',4,5,6'	5	26:16	23.47	0.796		4			
31	76	2',3,4,5	4	26:19	26.32	0.893		3			
31	70	2,3',4',5	4	26:26	26.43	0.897		4			
32	93	2,2',3,5,6	5	26:26	26.43	0.897		3			
32	95	2,2',3,5',6	5	26:33	26.55	0.901	coelutes #121	1			
33	121	2,3',4,5',6	5	26:34	26.57	0.901	coelutes #95	2			
32	66	2,3',4,4'	4	26:38	26.63	0.903		1	confirmed r.t.	EPA 20	Method 8082
32	80	3,3',5,5'	4	26:40	26.67	0.904		3			
33	88	2,2',3,4,6	5	26:46	26.77	0.908		1			
34	91	2,2',3,4',6	5	27:05	27.08	0.919		2			
34	55	2,3,3',4	4	27:18	27.30	0.926		2	confirmed r.t.	Injection cmpd	
35	155	2,2',4,4',6,6'	6	27:37	27.62	0.937		5			
35	56	2,3,3',4'	4	27:57	27.95	0.948	coelutes #60	5			
36	92	2,2',3,5,5'	5	28:02	28.03	0.951		1			

Accustandard PCB mixtures
Method 1668 congener set of 209 chlorinated congeners by HRG(
Mix #1 P.N. M-1668A-1-0.01-X 83 congeners
Mix #2 P.N. M-1668A-2-0.01-X 54 congeners
Mix #3 P.N. M-1668A-3-0.01-X 29 congeners
Mix #4 P.N. M-1668A-4-0.01-X 15 congeners
Mix #5 P.N. M-1668A-5-0.01-X 28 congeners

Ultra Scientific
EPA PCB congener calibration check solution
P.N. RPC-EPA2 20 congeners

Method 8082 PCB Congeners Mixture
P.N. RPCM-8082 19 congeners

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness
1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution				**Accustandard PCB mixtures**
35	60	2,3,4,4'	4	28:03	28.05	0.951	coelutes #56	2				
37	84	2,2',3,3',6	5	28:18	28.30	0.960		3				
38	90	2,2',3,4',5	5	28:27	28.45	0.965	coelutes #90	2				
37	89	2,2',3,4,6'	5	28:29	28.48	0.966	coelutes #90	1				
38	101	2,2',4,5,5'	5	28:34	28.57	0.969		3	confirmed r.t.	EPA 20	Method 8082	
38	113	2,3,3',5',6	5	28:40	28.67	0.972		1				
39	99	2,2',4,4',5	5	28:57	28.95	0.982		2				
39	79	3,3',4,5'	4	29:18	29.30	0.994		1				
40	119	2,3',4,4',6	5	29:27	29.45	0.999		1				
40	**150**	**2,2',3,4',6,6'**	**6**	**29:29**	**29.48**	**1.000**		2	confirmed r.t.	Injection cmpd		
40	112	2,3,3',5,6	5	29:34	29.57	1.003		3				
41	83	2,2',3,3',5	5	29:48	29.80	1.011	coelutes #109	1				
41	109	2,3,3',4,6	5	29:48	29.80	1.011	coelutes #83	2				
41	152	2,2',3,5,6,6'	6	30:04	30.07	1.020		1				
41	78	3,3',4,5	4	30:09	30.15	1.023		1				
42	97	2,2',3',4,5	5	30:18	30.30	1.028	coelutes #86	4				
42	86	2,2',3,4,5	5	30:20	30.33	1.029	coelutes #97	3				
42	125	2',3,4,5,6'	5	30:24	30.40	1.031		5				
42	117	2,3,4',5,6	5	30:40	30.67	1.040	coelutes #116,111	2				
42	145	2,2',3,4,6,6'	6	30:42	30.70	1.041		2				
42	116	2,3,4,5,6	5	30:42	30.70	1.041	coelutes #117,111	3				
43	111	2,3,3',5,5'	5	30:44	30.73	1.042	coelutes #116,117	2				
43	115	2,3,4,4',6	5	30:51	30.85	1.046	coelutes #87	4				
43	87	2,2',3,4,5'	5	30:53	30.88	1.047	coelutes #115	1	confirmed r.t.		Method 8082	
44	148	2,2',3,4',5,6'	6	30:54	30.90	1.048		1				
42	81	3,4,4',5	4	31:02	31.03	1.053		1				
44	85	2,2',3,4,4'	5	31:14	31.23	1.059		1				
45	120	2,3',4,5,5'	5	31:14	31.23	1.059		1				
45	136	2,2',3,3',6,6'	6	31:26	31.43	1.066		1				
47	154	2,2',4,4',5,6'	6	31:38	31.63	1.073		3				
46	110	2,3,3',4',6	5	31:41	31.68	1.075		5	confirmed r.t.		Method 8082	
46	77	3,3',4,4'	4	31:58	31.97	1.084		5	confirmed r.t.	EPA 20		
47	82	2,2',3,3',4	5	32:40	32.67	1.108		1				
47	151	2,2',3,5,5',6	6	32:43	32.72	1.110		1	confirmed r.t.		Method 8082	
48	135	2,2',3,3',5,6'	6	33:03	33.05	1.121		2				
48	144	2,2',3,4,5',6	6	33:11	33.18	1.125		1				
48	147	2,2',3,4',5,6	6	33:23	33.38	1.132		3				
48	124	2',3,4,5,5'	5	33:30	33.50	1.136		1				
49	108	2,3,3',4,5'	5	33:39	33.65	1.141		2				
49	107	2,3,3',4',5	5	33:45	33.75	1.145		3				
50	139	2,2',3,4,4',6	6	33:49	33.82	1.147	coelutes #149	2				
50	149	2,2',3,4',5',6	6	33:49	33.82	1.147	coelutes #139	2				
50	123	2',3,4,4',5	5	33:53	33.88	1.149		4				
50	140	2,2',3,4,4',6'	6	34:08	34.13	1.158		3				
50	106	2,3,3',4,5	5	34:10	34.17	1.159		1				
50	118	2,3',4,4',5	5	34:14	34.23	1.161		2				
51	143	2,2',3,4,5,6'	6	34:36	34.60	1.174		1	confirmed r.t.	EPA 20		
51	134	2,2',3,3',5,6	6	34:43	34.72	1.178		4				
52	142	2,2',3,4,5,6	6	35:01	35.02	1.188		1				
52	131	2,2',3,3',4,6	6	35:09	35.15	1.192		4				
52	114	2,3,4,4',5	5	35:11	35.18	1.193		2				
52	133	2,2',3,3',5,5'	6	35:14	35.23	1.195		1				
52	165	2,3,3',5,5',6	6	35:17	35.28	1.197		2				
52	122	2',3,3',4,5	5	35:20	35.33	1.198		1				
52	188	2,2',3,4',5,6,6'	7	35:22	35.37	1.200		5	confirmed r.t.	Injection cmpd		
53	146	2,2',3,4',5,5'	6	35:38	35.63	1.209	coelutes #161	3				
53	161	2,3,3',4,5',6	6	35:38	35.63	1.209	coelutes #146	1				
53	184	2,2',3,4,4',6,6'	7	36:06	36.10	1.224		2				
54	153	2,2',4,4',5,5'	6	36:17	36.28	1.231	coelutes #132	1	confirmed r.t.	EPA 20	Method 8082	
54	132	2,2',3,3',4,6'	6	36:18	36.30	1.231	coelutes #153	2				
54	168	2,3',4,4',5',6	6	36:25	36.42	1.235		2				
54	105	2,3,3',4,4'	5	36:39	36.65	1.243		1	confirmed r.t.	EPA 20		
54	127	3,3',4,5,5'	5	36:50	36.83	1.249		1				
55	179	2,2',3,3',5,6,6'	7	37:28	37.47	1.271		1				
55	141	2,2',3,4,5,5'	6	37:31	37.52	1.272		3	confirmed r.t.		Method 8082	
57	137	2,2',3,4,4',5	6	38:02	38.03	1.290		2				
57	176	2,2',3,3',4,6,6'	7	38:13	38.22	1.296		1				
56	130	2,2',3,3',4,5'	6	38:17	38.28	1.298		1				
58	164	2,3,3',4',5',6	6	38:41	38.68	1.312	coelutes #163	3				
58	163	2,3,3',4',5,6	6	38:43	38.72	1.313	coelutes #164	4				
58	138	2,2',3,4,4',5'	6	38:54	38.90	1.319		5	confirmed r.t.	EPA 20	Method 8082	
58	160	2,3,3',4,5,6	6	38:54	38.90	1.319		2				
58	158	2,3,3',4,4',6	6	39:02	39.03	1.324		3				
58	186	2,2',3,4,5,6,6'	7	39:03	39.05	1.324		2				
59	178	2,2',3,3',5,5',6	7	39:29	39.48	1.339		1				
59	129	2,2',3,3',4,5	6	39:33	39.55	1.341		1				
59	126	3,3',4,4',5	5	40:00	40.00	1.357		5	confirmed r.t.	EPA 20		
60	175	2,2',3,3',4,5',6	7	40:04	40.07	1.359		1				
59	166	2,3,4,4',5,6	6	40:11	40.18	1.363		1				
61	182	2,2',3,4,4',5,6'	7	40:23	40.38	1.370	coelutes #187	3				
61	187	2,2',3,4',5,5',6	7	40:23	40.38	1.370	coelutes #182	2	confirmed r.t.	EPA 20	Method 8082	
61	159	2,3,3',4,5,5'	6	40:42	40.70	1.380		1				
62	183	2,2',3,4,4',5',6	7	40:55	40.92	1.388		1	confirmed r.t.		Method 8082	
62	162	2,3,3',4',5,5'	6	41:14	41.23	1.399		2				
63	128	2,2',3,3',4,4'	6	41:31	41.52	1.408		2	confirmed r.t.	EPA 20		
64	167	2,3',4,4',5,5'	6	41:52	41.87	1.420		1	confirmed r.t.	13C labelled cmpd		
65	185	2,2',3,4,5,5',6	7	42:02	42.03	1.426		2				
66	174	2,2',3,3',4,5,6'	7	42:45	42.75	1.450		3				
66	181	2,2',3,4,4',5,6	7	42:51	42.85	1.453		2				
67	177	2,2',3,3',4',5,6	7	43:15	43.25	1.467		1				

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness

1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution				**Accustandard PCB mixtures**
68	202	2,2',3,3',5,5',6,6'	8	43:31	43.52	1.476		5				
68	171	2,2',3,3',4,4',6	7	43:45	43.75	1.484		1				
68	156	2,3,3',4,4',5	6	44:06	44.10	1.496		1				
69	173	2,2',3,3',4,5,6	7	44:16	44.27	1.501		3				
69	201	2,2',3,3',4,5',6,6'	8	44:21	44.35	1.504		1				
69	157	2,3,3',4,4',5'	6	44:33	44.55	1.511		2				
69	204	2,2',3,4,4',5,6,6'	8	44:36	44.60	1.513		1				
70	192	2,3,3',4,5,5',6	7	44:56	44.93	1.524		2				
70	172	2,2',3,3',4,5,5'	7	45:02	45.03	1.527		1				
71	197	2,2',3,3',4,4',6,6'	8	45:12	45.20	1.533		2				
72	180	2,2',3,4,4',5,5'	7	45:45	45.75	1.552	coelutes #193	4	confirmed r.t.	EPA 20	Method 8082	
73	193	2,3,3',4',5,5',6	7	45:48	45.80	1.553	coelutes #180	3				
74	191	2,3,3',4,4',5',6	7	46:13	46.22	1.568		1				
75	200	2,2',3,3',4,5,6,6'	8	46:50	46.83	1.588		1				
76	169	3,3',4,4',5,5'	6	48:03	48.05	1.630		5				
77	170	2,2',3,3',4,4',5	7	48:39	48.65	1.650	coelutes #190	1	confirmed r.t.	EPA 20	Method 8082	
77	190	2,3,3',4,4',5,6	7	48:39	48.65	1.650	coelutes #170	1				
78	198	2,2',3,3',4,5,5',6	8	49:05	49.08	1.665		1				
79	199	2,2',3,3',4,5,5',6'	8	49:23	49.38	1.675		2				
80	203	2,2',3,4,4',5,5',6	8	50:01	50.02	1.696	coelutes #196	2				
80	196	2,2',3,3',4,4',5,6'	8	50:03	50.05	1.698	coelutes #203	1				
81	189	2,3,3',4,4',5,5'	7	51:49	51.82	1.757		5				
82	208	2,2',3,3',4,5,5',6,6'	9	52:52	52.87	1.793		5				
82	195	2,2',3,3',4,4',5,6	8	53:04	53.07	1.800		1	confirmed r.t.	EPA 20		
83	207	2,2',3,3',4,4',5,6,6'	9	53:49	53.82	1.825		1				
84	194	2,2',3,3',4,4',5,5'	8	55:23	55.38	1.878		1	confirmed r.t.	13C labelled cmpd		
85	205	2,3,3',4,4',5,5',6	8	55:46	55.77	1.891		5				
86	206	2,2',3,3',4,4',5,5',6	9	59:05	59.08	2.004		5	confirmed r.t.	EPA 20	Method 8082	
87	209	2,2',3,3',4,4',5,5',6,6'	10	62:13	62.22	2.110		5	confirmed r.t.	EPA 20		

Compound Standard by Solution
(November 15, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

15 November 2014

Accustandard PCB congener Identification mixtures

SOLUTION #1

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
	2	3	1		0		1
1	10	2,6	2	12:55	12.92	coelutes #4	1
2	9	2,5	2	13:57	13.95	coelutes #7	1
3	6	2,3'	2	14:24	14.40		1
4	8	2,4'	2	14:43	14.72	coelutes #5	1
4	14	3,5	2	15:22	15.37		1
5	11	3,3'	2	16:24	16.40		1
5	30	2,4,6	3	15:59	15.98		1
7	27	2,3',6	3	17:16	17.27	coelutes #24	1
8	32	2,4',6	3	17:50	17.83		1
9	34	2',3,5	3	18:17	18.28	coelutes #23	1
11	26	2,3',5	3	18:58	18.97	coelutes #25	1
13	31	2,4',5	3	19:32	19.53	coelutes #28	1
13	50	2,2',4,6	4	19:19	19.32		1
14	33	2',3,4	3	20:07	20.12	coelutes #20	1
15	36	3,3',5	3	21:06	21.10		1
16	45	2,2',3,6	4	20:54	20.90		1
19	52	2,2',5,5'	4	21:48	21.80	coelutes #43	1
20	38	3,4,5	3	22:19	22.32		1
20	49	2,2',4,5'	4	22:06	22.10		1
21	75	2,4,4',6	4	22:18	22.30	coelutes #48,47	1
22	35	3,3',4	3	23:09	23.15		1
24	72	2,3',5,5'	4	23:58	23.97	coelutes #71,41	
25	41	2,2',3,4	4	24:08	24.13	coelutes #71,72	1
26	96	2,2',3,6,6'	5	24:29	24.48		1
27	103	2,2',4,5',6	5	24:40	24.67		
27	57	2,3,3',5	4	24:55	24.92		
29	63	2,3,4',5	4	25:44	25.73		1
32	66	2,3',4,4'	4	26:38	26.63		1
32	95	2,2',3,5',6	5	26:33	26.55	coelutes #121	1
33	88	2,2',3,4,6	5	26:46	26.77		1
36	92	2,2',3,5,5'	5	28:02	28.03		1
37	89	2,2',3,4,6'	5	28:29	28.48	coelutes #90	
38	113	2,3,3',5',6	5	28:40	28.67		
39	79	3,3',4,5'	4	29:18	29.30		
40	119	2,3',4,4',6	5	29:27	29.45		1
41	152	2,2',3,5,6,6'	6	30:04	30.07		
41	78	3,3',4,5	4	30:09	30.15		
41	83	2,2',3,3',5	5	29:48	29.80	coelutes #109	1
72	81	3,4,4',5	4	31:02	31.03		
43	87	2,2',3,4,5'	5	30:53	30.88		1
44	85	2,2',3,4,4'	5	31:14	31.23		1
44	148	2,2',3,4',5,6'	6	30:54	30.90		
45	136	2,2',3,3',6,6'	6	31:26	31.43		1
45	120	2,3',4,5,5'	5	31:14	31.23		
47	82	2,2',3,3',4	5	32:40	32.67		1
47	151	2,2',3,5,5',6	6	32:43	32.72		1
48	144	2,2',3,4,5',6	6	33:11	33.18		
48	124	2',3,4,5,5'	5	33:30	33.50		
50	106	2,3,3',4,5	5	34:10	34.17		
51	143	2,2',3,4,5,6'	6	34:36	34.60		1
52	122	2',3,3',4,5	5	35:20	35.33		1
52	142	2,2',3,4,5,6	6	35:01	35.02		
52	133	2,2',3,3',5,5'	6	35:14	35.23		

SOLUTION #2

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
2	7	2,4	2	13:57	13.95	coelutes #9	2
4	5	2,3	2	14:42	14.70	coelutes #8	2
5	12	3,4	2	16:43	16.72		
6	18	2,2',5	3	16:45	16.75		2
7	24	2,3,6	3	17:20	17.33	coelutes #27	2
8	23	2,3,5	3	18:22	18.37	coelutes #34	
13	28	2,4,4'	3	19:35	19.58	coelutes #31	2
14	53	2,2',5,6'	4	20:04	20.07		2
15	51	2,2',4,6'	4	20:25	20.42		2
15	22	2,3,4'	3	20:39	20.65		2
17	39	3,4',5	3	21:43	21.72		2
19	73	2,3',5',6	4	21:36	21.60		
21	48	2,2',4,5	4	22:16	22.27	coelutes #75,47	2
21	62	2,3,4,6	4	22:33	22.55		
24	71	2,3',4',6	4	24:00	24.00	coelutes #72,41	
25	68	2,3',4,5'	4	24:13	24.22	coelutes #64	
28	58	2,3,3',5'	4	25:26	25.43		
28	100	2,2',4,4',6	5	25:09	25.15		2
30	61	2,3,4,5	4	25:58	25.97		
30	94	2,2',3,5,6'	5	25:39	25.65		
33	121	2,3',4,5',6	5	26:34	26.57	coelutes #95	
34	91	2,2',3,4',6	5	27:05	27.08		2
34	55	2,3,3',4	4	27:18	27.30		2
35	60	2,3,4,4'	4	28:03	28.05	coelutes #56	2
38	90	2,2',3,4',5	5	28:27	28.45	coelutes #90	2
39	99	2,2',4,4',5	5	28:57	28.95		2
40	150	2,2',3,4',6,6'	6	29:29	29.48		2
41	109	2,3,3',4,6	5	29:48	29.80	coelutes #83	
42	117	2,3,4',5,6	5	30:40	30.67	coelutes #116,111	
42	145	2,2',3,4,6,6'	6	30:42	30.70		
43	111	2,3,3',5,5'	5	30:44	30.73	coelutes #116,117	
48	135	2,2',3,3',5,6'	6	33:03	33.05		2
49	108	2,3,3',4,5'	5	33:39	33.65		
50	149	2,2',3,4',5',6	6	33:49	33.82	coelutes #139	
50	139	2,2',3,4,4',6	6	33:49	33.82	coelutes #149	
50	118	2,3',4,4',5	5	34:14	34.23		2
52	114	2,3,4,4',5	5	35:11	35.18		
52	165	2,3,3',5,5',6	6	35:17	35.28		
53	184	2,2',3,4,4',6,6'	7	36:06	36.10		
54	132	2,2',3,3',4,6'	6	36:18	36.30	coelutes #153	
54	168	2,3',4,4',5',6	6	36:25	36.42		2
57	137	2,2',3,4,4',5	6	38:02	38.03		2
58	160	2,3,3',4,5,6	6	38:54	38.90		2
58	186	2,2',3,4,5,6,6'	7	39:03	39.05		
61	187	2,2',3,4',5,5',6	7	40:23	40.38	coelutes #182	2
62	162	2,3,3',4',5,5'	6	41:14	41.23		
63	128	2,2',3,3',4,4'	6	41:31	41.52		2
65	185	2,2',3,4,5,5',6	7	42:02	42.03		2
66	181	2,2',3,4,4',5,6	7	42:51	42.85		
69	157	2,3,3',4,4',5'	6	44:33	44.55		2
70	192	2,3,3',4,5,5',6	7	44:56	44.93		
71	197	2,2',3,3',4,4',6,6'	8	45:12	45.20		2
79	199	2,2',3,3',4,5,5',6'	8	49:23	49.38		2
80	203	2,2',3,4,4',5,5',6	8	50:01	50.02	coelutes #196	2

Compound Standard by Solution
(November 15, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

15 November 2014

Accustandard PCB congener Identification mixtures

SOLUTION #3

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
5	13	3,4'	2	16:46	16.77		
6	17	2,2',4	3	16:52	16.87		3
10	29	2,4,5	3	18:35	18.58		3
14	20	2,3,3'	3	20:06	20.10	coelutes #33	3
17	46	2,2',3,6'	4	21:24	21.40		3
21	65	2,3,5,6	4	22:26	22.43		
24	59	2,3,3',6	4	23:21	23.35		3
27	40	2,2',3,3'	4	24:42	24.70		3
28	67	2,3',4,5	4	25:17	25.28		3
31	76	2',3,4,5	4	26:19	26.32		
32	93	2,2',3,5,6	5	26:26	26.43		
32	80	3,3',5,5'	4	26:40	26.67		
37	84	2,2',3,3',6	5	28:18	28.30		3
38	101	2,2',4,5,5'	5	28:34	28.57		3
40	112	2,3,3',5,6	5	29:34	29.57		
42	86	2,2',3,4,5	5	30:20	30.33	coelutes #97	
42	116	2,3,4,5,6	5	30:42	30.70	coelutes #117,111	
47	154	2,2',4,4',5,6'	6	31:38	31.63		
48	147	2,2',3,4',5,6	6	33:23	33.38		
49	107	2,3,3',4',5	5	33:45	33.75		3
50	140	2,2',3,4,4',6'	6	34:08	34.13		
53	146	2,2',3,4',5,5'	6	35:38	35.63	coelutes #161	3
55	141	2,2',3,4,5,5'	6	37:31	37.52		3
58	164	2,3,3',4',5',6	6	38:41	38.68	coelutes #163	
58	158	2,3,3',4,4',6	6	39:02	39.03		3
61	182	2,2',3,4,4',5,6'	7	40:23	40.38	coelutes #187	
66	174	2,2',3,3',4,5,6'	7	42:45	42.75		3
69	173	2,2',3,3',4,5,6	7	44:16	44.27		3
73	193	2,3,3',4',5,5',6	7	45:48	45.80	coelutes #180	3

SOLUTION #4

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
12	25	2,3',4	3	19:04	19.07	coelutes #26	4
14	21	2,3,4	3	20:04	20.07		
18	69	2,3',4,6	4	21:32	21.53		4
21	47	2,2',4,4'	4	22:18	22.30	coelutes #75,48	4
24	42	2,2',3,4'	4	23:28	23.47		4
25	64	2,3,4',6	4	24:11	24.18	coelutes #68	4
31	102	2,2',4,5,6'	5	26:16	26.27		4
31	70	2,3',4',5	4	26:26	26.43		
42	97	2,2',3',4,5	5	30:18	30.30	coelutes #86	4
43	115	2,3,4,4',6	5	30:51	30.85	coelutes #87	4
50	123	2',3,4,4',5	5	33:53	33.88		4
51	134	2,2',3,3',5,6	6	34:43	34.72		4
52	131	2,2',3,3',4,6	6	35:09	35.15		4
58	163	2,3,3',4',5,6	6	38:43	38.72	coelutes #164	
72	180	2,2',3,4,4',5,5'	7	45:45	45.75	coelutes #193	4

SOLUTION #5

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
	1	2	1				
	3	4	1				
1	4	2,2'	2	12:55	12.92	coelutes #10	5
5	19	2,2',6	3	15:35	15.58		5
6	15	4,4'	2	17:07	17.12		5
8	16	2,2',3	3	17:48	17.80		5
9	54	2,2',6,6'	4	18:37	18.62		
20	43	2,2',3,5	4	21:54	21.90	coelutes #52	
22	104	2,2',4,6,6'	5	22:51	22.85		5
23	44	2,2',3,5'	4	23:13	23.22		5
24	37	3,4,4'	3	23:45	23.75		5
30	74	2,4,4',5	4	26:04	26.07		5
31	98	2,2',3',4,6	5	26:16	26.27		
35	56	2,3,3',4'	4	27:57	27.95	coelutes #60	5
35	155	2,2',4,4',6,6'	6	27:37	27.62		
42	125	2',3,4,5,6'	5	30:24	30.40		
46	110	2,3,3',4',6	5	31:41	31.68		5
46	77	3,3',4,4'	4	31:58	31.97		5
52	188	2,2',3,4',5,6,6'	7	35:22	35.37		5
58	138	2,2',3,4,4',5'	6	38:54	38.90		5
59	126	3,3',4,4',5	5	40:00	40.00		5
68	202	2,2',3,3',5,5',6,6'	8	43:31	43.52		5
76	169	3,3',4,4',5,5'	6	48:03	48.05		5
81	189	2,3,3',4,4',5,5'	7	51:49	51.82		5
82	208	2,2',3,3',4,5,5',6,6'	9	52:52	52.87		5
85	205	2,3,3',4,4',5,5',6	8	55:46	55.77		5
86	206	2,2',3,3',4,4',5,5',6	9	59:05	59.08		5
87	209	2,2',3,3',4,4',5,5',6,6'	10	62:13	62.22		5

Lower Willamette RM11 East Project 05 December 2014
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

This spreadsheet file provides all of the information that was used in converting GCMS data from Raw Counts to Concentrations/mass (PE or SED).

The overall strategy was as follows:

5 commercial mixtures of PCB congeners to ascertain the congener-specifc retention times and response factors (twice during the course of the analyses).
4 concentrations of a single commercial PCB congener mixture was used to confirm the linear response of the GCMS (and generate statistics).
Multiple **Recovery/Injection** standards and multiple **r.f. check standards** daily.
Raw Counts from the GC/MS were converted into PCB mass and corrected for procedural losses using 13C recovery compounds.
PCB mass was then **normalized to the mass of PE or SED** used to get PCB/g on a congener-specific basis.

Issues:	**Extreme PRC concentrations**:	PRC concentrations overwhelmed and interfered with some adjacent congeners.
Decisions:	**Coelutions:**	r.f's were averaged for the congeners involved.
	Recovery calculations:	Recoveries were averaged and that average applied to all homolog groups.
	PRCs	No attempt was made to correct congener concentrations for non-equilibrium conditions using PRC's.

The DATA from the PE and SED samples

Workbook pages labeled:	**PE Quant** (date)'	PE extractions
	ASE Blanks (date)'	Accelerated Solvent Extraction - blanks
	Willamette SED (date)'	Accelerated Solvent Extraction - SEDiments

Lower Willamette River Sediment Data

Lower Willamette Rivermile 11E Project							19 November 2014									
Client:	SEE, LLC															
MIT PRoject Number: 6931411														ng/kg Sediment Recovery Corrected		
				November 21, 2014 Extraction				November 19, 2014 Extraction					**Averaged Final Value**			
				200µL extr. Vol.				**1 mL extr. Vol.**								
				pg/g Sediment Recovery Corrected				**pg/g Sediment Recovery Corrected**					**pg/g Sediment Recovery Corrected**			
				Site 01		Site 01		Site 01		Site 04			Site 01		Site 04	
				1121SEDA		**1121SEDB**		**1119SEDA**		**1119SED4**			**1119SEDA**		**1119SED4**	
	Congener No.	# Cl														
1	1	1														
2	2	1														
3	3	1														
4	4 + 10	2		356		752		999		14316			702		14316	
5	5 + 8	2								1772					1772	
6	6	2														
7	7 + 9	2								1570					1570	
11	11	2														
12	12	2														
13	13	2														
14	14	2		1013		957		1343					1104			
15	15	2														
16	16 + 32	3		566		858				11672			712		11672	
17	17	3		461		809				31106			635		31106	
18	18	3								3046					3046	
19	19	3		1326		1712		1933		48822			1657		48822	
20	20+21+33	3		648		812		1468		3640			976		3640	
22	22	3														
23	23 + 34	3														
24	24+27	3		328		497				6934			412		6934	
25	25+26	3								2985					2985	
28	28+31	3	PRC	383						7393			383		7393	
29	29	3														
30	30	3														
35	35	3														
36	36	3		1616		1820		2078		2380			1838		2380	
37	37	3														
38	38	3								6256					6256	
39	39	3	INJ													
10	70	4		394		529				2216			461		2216	
40	40	4														
41	41+64+68	4								2743					2743	
42	42	4														
43	43	4														
44	44	4								1600					1600	
45	45	4														
46	46	4								2352					2352	
47	47+48+75	4	PRC	3598		3252		4233		143320			3694		143320	
49	49	4		2360		1928		2690		37567			2326		37567	
50	50	4								6381					6381	
51	51	4		1836		1567		2022		64041			1808		64041	
52	52	4		2894		2452		3332		28811			2893		28811	
53	53	4		2163		1900				36056			2032		36056	
54	54	4	PRC	395		399		669		17754			487		17754	
55	55	4	INJ													
56	56+60	4														
57	57	4														
58	58	4														
59	59	4														
62	62	4														
63	63	4		1305		1117				1637			1211		1637	
64	61	4														
65	65	4														
66	66+80	4		578						2230			578		2230	
67	67	4														
69	69	4								3387					3387	
71	71+72	4		559		437				6601			498		6601	
73	73	4		451		379				3589			415		3589	
74	74	4														
76	76	4														
77	77	4														
78	78	4														
79	79	4		580		590							585			
82	82	5		434		751				1952			592		1952	
83	83+109	5														
84	84	5				545				2695			545		2695	
85	85+120	5														
87	87+115	5		835		865				3003			850		3003	
88	88	5														
89	89+90+101	5		6279		6809		7213		32703			6767		32703	
91	91	5		2016		1753		2450		21961			2073		21961	
92	92	5		945		922				5116			934		5116	
93	93	5														

Lower Willamette River Sediment Data

Lower Willamette Rivermile 11E Project							19 November 2014									
Client:	SEE, LLC															
MIT PRoject Number: 6931411													ng/kg Sediment Recovery Corrected			
				November 21, 2014 Extraction				November 19, 2014 Extraction					Averaged Final Value			
				200µL extr. Vol.				1 mL extr. Vol.								
				pg/g Sediment Recovery Corrected				pg/g Sediment Recovery Corrected					pg/g Sediment Recovery Corrected			
				Site 01		Site 01		Site 01		Site 04			Site 01		Site 04	
				1121SEDA		**1121SEDB**		**1119SEDA**		**1119SED4**			**1119SEDA**		**1119SED4**	
	Congener No.	# Cl														
95	95+121	5		3750		4204		5116		21203			4357		21203	
96	96	5		341						5071			341		5071	
97	94	5								3933					3933	
97	97+86+125	5	PRC	518		430				2899			474		2899	
98	98+102	5								4790					4790	
99	99	5		1385		1281		1638		8823			1435		8823	
100	100	5		1430		1362		2129		27343			1640		27343	
103	103	5		661		468				6304			565		6304	
104	104	5	INJ													
105	105	5		619									619			
106	106+118	5		1476		1431		2317		5036			1741		5036	
107	107+108+123	5		863		787		1228		3259			959		3259	
110	110	5		2694		2990		3498		11128			3061		11128	
111	111+116+117	5	PRC							2067					2067	
112	112	5														
113	113	5														
114	114	5														
119	119	5						2221	p from Inj.	6222			2221		6222	
122	122	5														
124	124	5														
126	126	5														
127	127	5														
81	81+148	6		2381		2163		2374		2722			2306		2722	
128	128	6		1185		1040				3926			1112		3926	
129	129	6														
130	130	6		691		485							588			
131	131	6														
133	133+165	6														
134	134+143	6		519		606				2937			562		2937	
135	135	6		2439		2340		2952		8533			2577		8533	
136	136	6		2844		2864		3289		13417			2999		13417	
137	137	6														
138	138+160	6		9489		10840		10609		28178			10313		28178	
139	139+149	6		15066		16114		15774		53020			15651		53020	
140	140	6														
141	141	6		4593		4709		4792		12842			4698		12842	
142	142	6		521		454				2630			488		2630	
144	144	6		948		1182				3254			1065		3254	
145	145	6														
146	164+161	6		2873		2434		2642		9018			2649		9018	
147	147	6		2082		1321		2114		16659			1839		16659	
150	**150**	**6**	**INJ**													
151	151	6		5324		5691		6158		21801			5724		21801	
152	152	6								1602					1602	
153	153+132	6	PRC	18197		18751		20308		58185			19085		58185	
154	154	6		471		413				4809			442		4809	
155	155	6														
156	156	6		1101		877				3068			989		3068	
157	157	6														
158	158	6		1213		1332		1480		4350			1341		4350	
159	159	6														
162	162	6														
163	163+164	6		7100		6570		8382		24212			7351		24212	
166	166	6														
167	167	6		470		545				1695			507		1695	
168	168	6		4082		4195		3877		11718			4051		11718	
169	169	6														
170	170+190	7		6204		3929		7139		16841			5758		16841	
171	171	7		3069		2373		3174		7160			2872		7160	
172	172+192	7		1911		1285		2268		4989			1822		4989	
173	173	7														
174	174+181	7		12036		9155		12944		28339			11378		28339	
175	175	7								4139					4139	
176	176	7		1532		1236		1768		4007			1512		4007	
177	177	7		6930		4858		7464		18296			6417		18296	
178	178	7	PRC	2238		1928		2734		7063			2300		7063	
179	179	7		4983		4195		5047		14258			4742		14258	
180	180+193	7		31633		19650		31825		75323			27703		75323	
182	182+187	7		14596		11376		16937		39148			14303		39148	
183	183	7		6632		5331		7229		16770			6397		16770	
184	184	7		750		753							751			
185	185	7		1445		1212							1328			
186	186	7														

Lower Willamette River Sediment Data

Lower Willamette Rivermile 11E Project							19 November 2014									
Client:	SEE, LLC															
MIT PRoject Number: 6931411													ng/kg Sediment Recovery Corrected			
				November 21, 2014 Extraction				November 19, 2014 Extraction					**Averaged Final Value**			
				200µL extr. Vol.				**1 mL extr. Vol.**								
				pg/g Sediment Recovery Corrected				**pg/g Sediment Recovery Corrected**					**pg/g Sediment Recovery Corrected**			
				Site 01		Site 01		Site 01		Site 04			Site 01		Site 04	
				1121SEDA		**1121SEDB**		**1119SEDA**		**1119SED4**			**1119SEDA**		**1119SED4**	
	Congener No.	# Cl														
188	188	7	INJ													
189	189	7		604									604			
191	191	7		623		459							541			
194	194	8		8060		4009		10234		19436			7435		19436	
195	195	8		3256		1856		5776		10797			3630		10797	
196	196+203	8		8585		4535		10632		21764			7917		21764	
198	198	8														
199	199	8		6736		3923		9565		16023			6741		16023	
200	200	8		1188		839							1013			
201	201	8								4140					4140	
202	202	8						cutoff switching ion groups								
204	204	8														
205	205	8														
206	206	9		1646				3118		5669			2382		5669	
207	207	9														
208	208	9														
209	209	10														

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
2	1							1	**r.f. (area cts/pg)**								
1	1							1									
3	1			1													
4	2	12:55						220034	2200								
10	2	12:55		333360					3334								
7	2	13:57			364860				3649								
9	2	13:57		360594					3606					Method 8082 PCB Congeners Mixture			
6	2	14:24		344913					3449					P.N.	RPCM-8082		19 congeners
5	2	14:42			357137				3571			Method 8082					
8	2	14:43		362071					3621	Ultra Sci. EPA calibration cmpd							
14	2	15:22		359811					3598								
19	3	15:35						162810	1628								
30	3	15:59		253812					2538								
11	2	16:24		354125					3541								
12	2	16:43			394601				3946								
18	3	16:45			185538				1855	Ultra Sci. EPA calibration cmpd		Method 8082					
13	2	16:46				325896			3259								
17	3	16:52				180749			1807								
15	2	17:07						340367	3404								
27	3	17:16		245140					2451								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
24	3	17:20			256268				2563								
16	3	17:48						149892	1499								
32	3	17:50		267484					2675								
34	3	18:17		257815					2578								
23	3	18:22			267546				2675								
29	3	18:35				263232			2632								
54	4	18:37	PRC					436706	2184								
26	3	18:58		266913					2669								
25	3	19:04					270164		2702								
50	4	19:19		356273					1781								
31	3	19:32		275339					2753			Method 8082					
28	3	19:35	PRC		287786				2878	Ultra Sci. EPA calibration cmpd							
21	3	20:04					260671		2607								
20	3	20:06				241830			2418								
33	3	20:07		260071					2601								
53	4	20:04			374971				1875								
51	4	20:25			371698				1858								
22	3	20:39			265918				2659								
45	4	20:54		328602					1643								
36	3	21:06		267888					2679								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
46	4	21:24				307394			1537								
69	4	21:32					460651		2303								
73	4	21:36			476064				2380								
39	3	21:43	INJ		289056				2891								
52	4	21:48		375206					1876	Ultra Sci. EPA calibration cmpd		Method 8082					
43	4	21:54						308334	1542								
49	4	22:06		386106					1931								
48	4	22:16			395770				1979								
47	4	22:18	PRC				416016		2080								
75	4	22:18		501013					2505								
38	3	22:19		274936					2749								
65	4	22:26				470132			2351								
62	4	22:33			486709				2434								
104	5	22:51	INJ					421877	2109								
35	3	23:09		273751					2738								
44	4	23:13						313109	1566	Ultra Sci. EPA calibration cmpd		Method 8082					
59	4	23:21				469473			2347								
42	4	23:28					348430		1742								
37	3	23:45						231202	2312								
72	4	23:58		503226					2516								

Lower Willamette RM11 East Project										15 November 2014							
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MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
71	4	24:00			513175				2566								
41	4	24:08		353248					1766								
64	4	24:11					525192		2626								
68	4	24:13			541380				2707								
96	5	24:29		433415					2167								
103	5	24:40		363557					1818								
40	4	24:42				287889			1439								
57	4	24:55		496959					2485								
100	5	25:09			368686				1843								
67	4	25:17				514933			2575								
58	4	25:26			508866				2544								
94	5	25:39			317790				1589								
63	4	25:44		500887					2504								
61	4	25:58			429317				2147								
74	4	26:04						474532	2373								
98	5	26:16						306009	1530								
102	5	26:16					360772		1804								
76	4	26:19				488768			2444								
70	4	26:26					525055		2625								
93	5	26:26				311284			1556								

Lower Willamette RM11 East Project										15 November 2014							
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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
95	5	26:33		334142					1671								
121	5	26:34			464918				2325								
66	4	26:38		518968					2595	Ultra Sci. EPA calibration cmpd		Method 8082					
80	4	26:40				538495			2692								
88	5	26:46		322961					1615								
91	5	27:05			356313				1782								
55	4	27:18	INJ		503634				2518								
155	6	27:37						385468	1927								
56	4	27:57						453291	2266								
60	4	28:03			515375				2577								
92	5	28:02		325778					1629								
84	5	28:18				302416			1512								
90	5	28:27			339416				1697								
89	5	28:29		311632					1558								
101	5	28:34				394565			1973	Ultra Sci. EPA calibration cmpd		Method 8082					
113	5	28:40		420711					2104								
99	5	28:57			399424				1997								
79	4	29:18		507664					2538								
119	5	29:27		459709					2299								
150	**6**	**29:29**	**INJ**		400281				2001								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
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	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
112	5	29:34				455971			2280								
83	5	29:48		281265					1406								
109	5	29:48			452199				2261								
152	6	30:04		385208					1926								
78	4	30:09		513443					2567								
97	5	30:18	PRC				337967		1690								
86	5	30:20				317206			1586								
125	5	30:24						422217	2111								
117	5	30:40			469047				2345								
116	5	30:42				437212			2186								
111	5	30:44	PRC		491989				2460								
145	6	30:42			400421				2002								
115	5	30:51					474413		2372								
87	5	30:53		352904					1765			Method 8082					
148	6	30:54		289894					1449								
81	4	31:02		489822					2449								
85	5	31:14		834847					2087								
120	5	31:14							2087								
136	6	31:26		385195					1926								
154	6	31:38				342849			1714								

Lower Willamette RM11 East Project										15 November 2014							
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	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
110	5	31:41						431142	2156			Method 8082					
77	4	31:58						415882	2079	Ultra Sci. EPA calibration cmpd							
82	5	32:40		311214					1556								
151	6	32:43		298867					1494			Method 8082					
135	6	33:03			296848				1484								
144	6	33:11		296536					1483								
147	6	33:23				307881			1539								
124	5	33:30		463945					2320								
108	5	33:39			453296				2266								
107	5	33:45				480765			2404								
123	5	33:53					448908		2245								
139	6	33:49			633388				1583								
149	6	33:49							1583								
140	6	34:08				309399			1547								
106	5	34:10		444960					2225								
118	5	34:14			453386				2267	Ultra Sci. EPA calibration cmpd							
143	6	34:36		273929					1370								
134	6	34:43					265525		1328								
142	6	35:01		275562					1378								
131	6	35:09					274286		1371								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
114	5	35:11			474425				2372								
133	6	35:14		278064					1390								
165	6	35:17			368762				1844								
122	5	35:20		448153					2241								
188	7	35:22	INJ					318273	1591								
146	6	35:38				388947			1945								
161	6	35:38		313110					1566								
184	7	36:06			353411				1767								
153	6	36:17	PRC	344990					1725	Ultra Sci. EPA calibration cmpd		Method 8082					
132	6	36:18			401523				2008								
168	6	36:25			285476				1427								
105	5	36:39		447313					2237	Ultra Sci. EPA calibration cmpd							
127	5	36:50		467706					2339								
179	7	37:28		329896					1649								
141	6	37:31				300469			1502			Method 8082					
137	6	38:02			311200				1556								
176	7	38:13		329516					1648								
130	6	38:17		276448					1382								
164	6	38:41				389706			1949								
163	6	38:43					405533		2028								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
138	6	38:54						389469	1947	Ultra Sci. EPA calibration cmpd		Method 8082					
160	6	38:54			290047				1450								
158	6	39:02				409950			2050								
186	7	39:03			337324				1687								
178	7	39:29	PRC	243957					1220								
129	6	39:33		278003					1390								
126	5	40:00						398400	1992	Ultra Sci. EPA calibration cmpd							
175	7	40:04		249788					1249								
166	6	40:11		384075					1920								
182	7	40:23				267318			1337								
187	7	40:23			279652				1398	Ultra Sci. EPA calibration cmpd		Method 8082					
159	6	40:42		383593					1918								
183	7	40:55		273272					1366			Method 8082					
162	6	41:14			403079				2015								
128	6	41:31			291052				1455	Ultra Sci. EPA calibration cmpd							
167	6	41:52		395956					1980								
185	7	42:02			263010				1315								
174	7	42:45				248870			1244								
181	7	42:51			265744				1329								
177	7	43:15		237551					1188								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
202	8	43:31						cut off	0								
171	7	43:45		242669					1213								
156	6	44:06		375839					1879								
173	7	44:16				224260			1121								
201	8	44:21		473161					1577								
157	6	44:33			383035				1915								
204	8	44:36		460928					1536								
192	7	44:56			305004				1525								
172	7	45:02		235539					1178								
197	8	45:12			495340				1651								
180	7	45:45					261681		1308	Ultra Sci. EPA calibration cmpd		Method 8082					
193	7	45:48				326695			1633								
191	7	46:13		311440					1557								
200	8	46:50		463557					1545								
169	6	48:03						330891	1654								
170	7	48:39		530904					1327	Ultra Sci. EPA calibration cmpd		Method 8082					
190	7	48:39							1327								
198	8	49:05		329661					1099								
199	8	49:23			342740				1142								
203	8	50:01			374924				1250								

Lower Willamette RM11 East Project										15 November 2014							
Client:	SEE, LLC																
MIT Project Number:	6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.														
	# Cl	R.T. (**min**)															
Recovery Cmpd																	
13C PCB 19	3	15:35								Notes:	15 Nov 2014 - 1st GCMS runs to determine ion group collection times, individual congener retention times and individual congener response factors.						
13C PCB 52	4	21:48															
13C PCB 105	5	36:39								**Accustandard PCB mixtures**							
13C PCB167	6	41:52								Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS							
13C PCB 194	8	55:23								Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners				
										Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners				
Injection Cmpd										Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners				
d17-39	3	21:43								Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners				
d22-104	5	22:51								Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners				
d34-55	4	27:18															
d40-150	6	29:29								**Ultra Scientific**							
d52-188	7	35:22								EPA PCB congener calibration check solution							
										P.N.	RPC-EPA2		20 congeners				
				200 ng/mL						Accustandard mixture concentrations							
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected						
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5		**100**	**200**	**300**					
				AREA COUNTS / µL INJECTED					Accustandard								
Congener No.	# Cl	R.T. (**min**)							PCB mixes								
196	8	50:03		344824					1149								
189	7	51:49						274384	1372								
208	9	52:52						390429	1301								
195	8	53:04		311996					1040	Ultra Sci. EPA calibration cmpd							
207	9	53:49		467706					1559								
194	8	55:23		328655					1096								
205	8	55:46						366934	1223								
206	9	59:05						266594	889	Ultra Sci. EPA calibration cmpd		Method 8082					
209	10	62:13						317176	1057	Ultra Sci. EPA calibration cmpd							
				115PCB1	1115PCB2	1115PCB3	1115PCB4	1115PCB5									
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5									
		congener count		81	53	29	15	27									
				2 coelutions	1 coelution			1 missed ion									
				PCB 85,120	PCB 138,149			PCB 202									
				PCB 170,190													

Lower Willamette RM11 East Project									16 November 2014						
Client:	SEE, LLC														
MIT Project Number: 6931411															
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.												
Willamette River Project															
	GCMS Analysis Sequence														
16 November 2014															
Run time	**MIT data file**						Notes:	16 Nov 2014 - Analyzing Aroclor 1242 and 1260 technical mixtures as an aid in congen							
								Confirming single point r.f's with a 20 compound PCB standard 4-point CAL curve.							
08:57	1116HEX	JT Baker Ultra hexane						Analyzing 13C Recovery compounds and rare PCB congener Injection compounds for							
10:07	1116AR42	Aroclor 1242 technical mix						Analyzing concentrated PE extracts.							
11:17	1116AR60	Aroclor 1260 technical mix													
12:27	1116HEX1	JT Baker Ultra hexane													
13:38	1116REIN	Recovery/Injection cmpds		100ng/mL											
14:48	1116EPA	Ultra Sci. EPA Cal cmpds		12.5 ng/mL											
15:58	1116EPA1	Ultra Sci. EPA Cal cmpds		25 ng/mL											
17:09	1116EPA2	Ultra Sci. EPA Cal cmpds		50 ng/mL											
18:19	1116EPA3	Ultra Sci. EPA Cal cmpds		100 ng/mL											
19:29	1116ULTR	Ultra Sci. Method 8082 mix		100 ng/mL											
20:39	1116HEX2	JT Baker Ultra hexane													
21:50	1116WW04	**PE Site 4, WW**		~50µL extract volume											
23:00	1116WP04	**PE Site 4, WP**		~50µL extract volume											
00:11	1116RIN2	Recovery/Injection cmpds		100ng/mL											
01:21	1116WW01	**PE Site 1, WW**		~200µL extract volume											
02:31	1116WP01	**PE Site 1, WP**		~200µL extract volume											
03:41	1116EP2A	Ultra Sci. EPA Cal cmpds		50 ng/mL											
04:52	1116HEX3	JT Baker Ultra hexane													

Accelerated Solvent Extract Blanks
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014

Client: SEE, LLC

MIT PRoject Number: 6931411

Recovery compound added	**100000** pg
Injection compound added	**100000** pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners

(once the Accustandard mixes are adjusted for varying concentrations within solutions)

Blanks reflect the ASE sequential processing steps: Extraction **SOL**vent, concentrating etc; **SYS**tem processing on previously extrac

Ottawa **SaND** taken thru all the handling steps (weighing, transfer, REC cmpd addition, etc.) and finally, **INJ** cmpd addition to JT Ba

Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED

A 2000 area count criteria was used as the minimum for peak reporting.

Congener response factor variations and masses of PE result in variations in the MDL.

Recovery Cmpd	# Cl	R.T. (min)		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		
				Blanks - Accelerated Solvent Extracts												
				AREA COUNTS / µL INJECTED											r.f. (area/pg)	
13C PCB 19	3	15:35				103349	102888					0.97	0.99		1070	
13C PCB 52	4	21:48				113219	111404					0.97	0.98		1169	
13C PCB 105	5	36:39				140492	138748					1.03	1.03		1379	
13C PCB167	6	41:52				124653	120100					1.00	0.99		1249	
13C PCB 194	8	55:23				72843	78785					0.91	1.00		806	
									AVE frac. recov'd			0.98	1.00			
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)	
d17-39	3	21:36		215123	226156	205448	213272	219523		1047	996	1096	1056	1026	2252	
d22-104	5	22:33		185540	194046	186125	176376	193581		1035	990	1032	1089	992	1920	
d34-55	4	27:05		191400	199237	201880	198583	204355		1046	1004	991	1008	979	2001	
d40-150	6	29:27		169707	179424	169347	160085	177271		985	931	987	1044	943	1671	
d52-188	7	35:20		151837	152115	149728	146545	157706		911	909	923	944	877	1383	
									AVE. Calc'd Vol (µL)	1005	966	1006	1028	963		

Congener No.	# Cl	R.T. (min)		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**			
				Blanks - Accelerated Solvent Extracts						Blanks - Accelerated Solvent Extracts							
				1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.		Accustandard
2	1										NO Handling		Weighing etc.	Reinjection	Coelution	PCB mixes
1	1			AREA COUNTS / µL INJECTED						Inj Cmpd	Ottawa Sand	Solvent	Ottawa Sand	Inj. Cmpd	AVE r.f.	r.f. (area cts/pg)
3	1															
4	2	12:55		< 2000	< 2000	< 2000	< 2000	< 2000		pg/µL	pg/g SED	pg/Total Xtr.	pg/g SED	pg/µL		1966
10	2	12:55													2473	2979
7	2	13:57		< 2000	< 2000	< 2000	< 2000	< 2000								2915
9	2	13:57													2997	3079
6	2	14:24		< 2000	< 2000	< 2000	< 2000	< 2000								3029
5	2	14:42		< 2000	< 2000	< 2000	< 2000	< 2000								2877
8	2	14:43													3035	3194
14	2	15:22		5171	< 2000	< 2000	< 2000	< 2000		1.7						3044
19	3	15:35		< 2000	< 2000	< 2000	< 2000	< 2000								1459
30	3	15:59		< 2000	< 2000	< 2000	< 2000	< 2000								2140
11	2	16:24		< 2000	< 2000	< 2000	< 2000	< 2000								2818
12	2	16:43		< 2000	< 2000	< 2000	< 2000	< 2000								2980
18	3	16:45		< 2000	< 2000	< 2000	< 2000	< 2000								1524
13	2	16:46		< 2000	< 2000	< 2000	< 2000	< 2000								2265
17	3	16:52		< 2000	< 2000	< 2000	< 2000	< 2000								1512
15	2	17:07		< 2000	< 2000	< 2000	< 2000	< 2000								3045
27	3	17:16		< 2000	< 2000	< 2000	< 2000	< 2000								2173
24	3	17:20													2164	2154
16	3	17:48		< 2000	< 2000	< 2000	< 2000	< 2000								1287
32	3	17:50													1785	2283
34	3	18:17		< 2000	< 2000	< 2000	< 2000	< 2000								2242
23	3	18:22													2208	2175
29	3	18:35		< 2000	< 2000	< 2000	< 2000	< 2000								2175
54	4	18:37	PRC	< 2000	< 2000	< 2000	< 2000	< 2000								1957
26	3	18:58		< 2000	< 2000	< 2000	< 2000	< 2000								2300
25	3	19:04													2071	1841
50	4	19:19		< 2000	< 2000	< 2000	< 2000	< 2000								1559
31	3	19:32		< 2000	< 2000	< 2000	< 2000	< 2000								2392
28	3	19:35	PRC												2323	2255
21	3	20:04		< 2000	< 2000	< 2000	< 2000	< 2000								1769
20	3	20:06														1976
33	3	20:07													2128	2249
53	4	20:04		< 2000	< 2000	< 2000	< 2000	< 2000								1548
51	4	20:25		< 2000	< 2000	< 2000	< 2000	< 2000								1583
22	3	20:39		< 2000	< 2000	< 2000	< 2000	< 2000								2192
45	4	20:54		< 2000	< 2000	< 2000	< 2000	< 2000								1421
36	3	21:06		2841	4422	4176	5461	3698		1.2	1839	1851	2417	1.6		2323
46	4	21:24		< 2000	< 2000	< 2000	< 2000	< 2000								1264
69	4	21:32		< 2000	< 2000	< 2000	< 2000	< 2000								1571
73	4	21:36		< 2000	< 2000	< 2000	< 2000	< 2000								1964
39	3	21:43	INJ	215123	226156	205448	213272	219523								2252
52	4	21:48		< 2000	< 2000	< 2000	< 2000	< 2000								1588
43	4	21:54		< 2000	< 2000	< 2000	< 2000	< 2000								1310
49	4	22:06		< 2000	< 2000	< 2000	< 2000	< 2000								1662
48	4	22:16		< 2000	< 2000	< 2000	< 2000	< 2000								1582
47	4	22:18	PRC													1447
75	4	22:18													1751	2225

Ultra Scientific EPA Congener Calibration Std.						
50	100	100	50			
pg/µL						Accustandard
					EPA Average	PCB mixes
1119EPA	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)
133390	269081	280218	141485		2748	3194
69916	134538	147492	73166		1420	1524
98323	198060	215261	109970		2075	2255
67228	137666	149074	74358		1425	1588

Accelerated Solvent Extract Blanks
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014

Client: SEE, LLC

MIT PRoject Number: 6931411

Recovery compound added	100000	pg
Injection compound added	100000	pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners

(once the Accustandard mixes are adjusted for varying concentrations within solutions)

Blanks reflect the ASE sequential processing steps: Extraction **SOL**vent, concentrating etc; **SYS**tem processing on previously extrac

Ottawa **SaND** taken thru all the handling steps (weighing, transfer, REC cmpd addition, etc.) and finally, **INJ** cmpd addition to JT Ba

Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED

A 2000 area count criteria was used as the minimum for peak reporting.

Congener response factor variations and masses of PE result in variations in the MDL.

				Blanks - Accelerated Solvent Extracts						Blanks - Accelerated Solvent Extracts																	
		R.T.		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**													
Recovery Cmpd	# Cl	(min)																									
				AREA COUNTS / µL INJECTED											r.f. (area/pg)												
13C PCB 19	3	15:35				103349	102888					0.97	0.99		1070												
13C PCB 52	4	21:48				113219	111404					0.97	0.98		1169												
13C PCB 105	5	36:39				140492	138748					1.03	1.03		1379												
13C PCB167	6	41:52				124653	120100					1.00	0.99		1249												
13C PCB 194	8	55:23				72843	78785					0.91	1.00		806												
									AVE frac. recov'd			0.98	1.00														
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)												
d17-39	3	21:36		215123	226156	205448	213272	219523		1047	996	1096	1056	1026	2252												
d22-104	5	22:33		185540	194046	186125	176376	193581		1035	990	1032	1089	992	1920												
d34-55	4	27:05		191400	199237	201880	198583	204355		1046	1004	991	1008	979	2001												
d40-150	6	29:27		169707	179424	169347	160085	177271		985	931	987	1044	943	1671												
d52-188	7	35:20		151837	152115	149728	146545	157706		911	909	923	944	877	1383												
									AVE. Calc'd Vol (µL)	1005	966	1006	1028	963													

																	Ultra Scientific EPA Congener Calibration Std.										
		R.T.		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**			50	100	100	50							
Congener No.	# Cl	(min)		1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.		Accustandard	pg/µL						Accustandard				
2	1										NO Handling		Weighing etc.	Reinjection	Coelution	PCB mixes						EPA Average	PCB mixes				
1	1			AREA COUNTS / µL INJECTED						Inj Cmpd	Ottawa Sand	Solvent	Ottawa Sand	Inj. Cmpd	AVE r.f.	r.f. (area cts/pg)	**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)				
38	3	22:19		< 2000	< 2000	< 2000	< 2000	< 2000								2316							2316				
65	4	22:26		< 2000	< 2000	< 2000	< 2000	< 2000								1875							1875				
62	4	22:33		< 2000	< 2000	< 2000	< 2000	< 2000								1974							1974				
104	5	22:51	INJ	185540	194046	186125	176376	193581								1920							1920				
35	3	23:09		< 2000	< 2000	< 2000	< 2000	< 2000								2088							2088				
44	4	23:13		< 2000	< 2000	< 2000	< 2000	< 2000								1340	59339	121685	129094	65564		1251	1340				
59	4	23:21		< 2000	< 2000	< 2000	< 2000	< 2000								1865							1865				
42	4	23:28		< 2000	< 2000	< 2000	< 2000	< 2000								1244							1244				
37	3	23:45		< 2000	< 2000	< 2000	< 2000	< 2000								1966							1966				
72	4	23:58		< 2000	< 2000	< 2000	< 2000	< 2000								2160							2160				
71	4	24:00													2132	2104							2104				
41	4	24:08														1514							1514				
64	4	24:11		< 2000	< 2000	< 2000	< 2000	< 2000								1776							1776				
68	4	24:13													1814	2152							2152				
96	5	24:29		< 2000	< 2000	< 2000	< 2000	< 2000								1875							1875				
103	5	24:40		< 2000	< 2000	< 2000	< 2000	< 2000								1570							1570				
40	4	24:42		< 2000	< 2000	< 2000	< 2000	< 2000								1125							1125				
57	4	24:55		< 2000	< 2000	< 2000	< 2000	< 2000								2110							2110				
100	5	25:09		< 2000	< 2000	< 2000	< 2000	< 2000								1512							1512				
67	4	25:17		< 2000	< 2000	< 2000	< 2000	< 2000								1958							1958				
58	4	25:26		< 2000	< 2000	< 2000	< 2000	< 2000								2051							2051				
94	5	25:39		< 2000	< 2000	< 2000	< 2000	< 2000								1335							1335				
63	4	25:44		2706	2196	2596	2592	3458		1.3	989	1247	1243	1.6		2144							2144				
61	4	25:58		< 2000	< 2000	< 2000	< 2000	< 2000								1858							1858				
74	4	26:04		< 2000	< 2000	< 2000	< 2000	< 2000								1931							1931				
98	5	26:16		< 2000	< 2000	< 2000	< 2000	< 2000								1307							1307				
102	5	26:16													1277	1247							1247				
76	4	26:19		< 2000	< 2000	< 2000	< 2000	< 2000								1833							1833				
70	4	26:26		< 2000	< 2000	< 2000	< 2000	< 2000								1736							1736				
93	5	26:26		< 2000	< 2000	< 2000	< 2000	< 2000								1208							1208				
95	5	26:33		< 2000	< 2000	< 2000	< 2000	< 2000								1458							1458				
121	5	26:34													1642	1825							1825				
66	4	26:38		< 2000	< 2000	< 2000	< 2000	< 2000								2204	83794	178074	187441	95438		1810	2204				
80	4	26:40													2124	2044							2044				
88	5	26:46		< 2000	< 2000	< 2000	< 2000	< 2000								1373							1373				
91	5	27:05		< 2000	< 2000	< 2000	< 2000	< 2000								1431							1431				
55	4	27:18	INJ	191400	199237	201880	198583	204355								2001							2001				
155	6	27:37		< 2000	< 2000	< 2000	< 2000	< 2000								1721							1721				
56	4	27:57		< 2000	< 2000	< 2000	< 2000	< 2000								2009							2009				
60	4	28:03													2039	2069							2069				
92	5	28:02		< 2000	< 2000	< 2000	< 2000	< 2000								1352							1352				
84	5	28:18		< 2000	< 2000	< 2000	< 2000	< 2000								1177							1177				
90	5	28:27														1378							1378				
89	5	28:29		< 2000	< 2000	< 2000	< 2000	< 2000								1351							1351				
101	5	28:34													1388	1437	63326	128732	145393	69428		1349	1437				
113	5	28:40		< 2000	< 2000	< 2000	< 2000	< 2000								1778							1778				
99	5	28:57		< 2000	< 2000	< 2000	< 2000	< 2000								1550							1550				
79	4	29:18		< 2000	< 2000	< 2000	< 2000	< 2000								2036							2036				

Accelerated Solvent Extract Blanks
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014
Client: SEE, LLC
MIT PRoject Number: 6931411

Recovery compound added	**100000** pg
Injection compound added	**100000** pg

Blanks - Accelerated Solvent Extracts

Recovery Cmpd	# Cl	R.T. (min)		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**	r.f. (area/pg)
				AREA COUNTS / µL INJECTED											
13C PCB 19	3	15:35				103349	102888					0.97	0.99		1070
13C PCB 52	4	21:48				113219	111404					0.97	0.98		1169
13C PCB 105	5	36:39				140492	138748					1.03	1.03		1379
13C PCB167	6	41:52				124653	120100					1.00	0.99		1249
13C PCB 194	8	55:23				72843	78785					0.91	1.00		806
									AVE frac. recov'd			0.98	1.00		
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)
d17-39	3	21:36		215123	226156	205448	213272	219523		1047	996	1096	1056	1026	2252
d22-104	5	22:33		185540	194046	186125	176376	193581		1035	990	1032	1089	992	1920
d34-55	4	27:05		191400	199237	201880	198583	204355		1046	1004	991	1008	979	2001
d40-150	6	29:27		169707	179424	169347	160085	177271		985	931	987	1044	943	1671
d52-188	7	35:20		151837	152115	149728	146545	157706		911	909	923	944	877	1383
									AVE. Calc'd Vol (µL)	1005	966	1006	1028	963	

Blanks - Accelerated Solvent Extracts — Blanks - Accelerated Solvent Extracts

Congener No.	# Cl	R.T. (min)		**1119ASIN** 1mL extr. Vol.	**1119ASYS** 1mL extr. Vol.	**1119SOL** 1mL extr. Vol.	**1119ASND** 1mL extr. Vol.	**1119ASI1** 1mL extr. Vol.	approximate	**1119ASIN** 1mL extr. Vol.	**1119ASYS** 1mL extr. Vol.	**1119SOL** 1mL extr. Vol.	**1119ASND** 1mL extr. Vol.	**1119ASI1** 1mL extr. Vol.		Accustandard
2	1										NO Handling		Weighing etc.	Reinjection	Coelution	PCB mixes
1	1			AREA COUNTS / µL INJECTED						Inj Cmpd	Ottawa Sand	Solvent	Ottawa Sand	Inj. Cmpd	AVE r.f.	r.f. (area cts/pg)
119	5	29:27		< 2000	< 2000	< 2000	< 2000	< 2000								1971
150	**6**	**29:29**	**INJ**	169707	179424	169347	160085	177271								1671
112	5	29:34		< 2000	< 2000	< 2000	< 2000	< 2000								1720
83	5	29:48		< 2000	< 2000	< 2000	< 2000	< 2000								1207
109	5	29:48													1502	1797
152	6	30:04		< 2000	< 2000	< 2000	< 2000	< 2000								1651
78	4	30:09		< 2000	< 2000	< 2000	< 2000	< 2000								2216
97	5	30:18	PRC													1162
86	5	30:20		< 2000	< 2000	< 2000	< 2000	< 2000								1210
125	5	30:24													1395	1811
117	5	30:40														1821
116	5	30:42		< 2000	< 2000	< 2000	< 2000	< 2000								1669
111	5	30:44	PRC												1834	2012
145	6	30:42		< 2000	< 2000	< 2000	< 2000	< 2000								1638
115	5	30:51		< 2000	< 2000	< 2000	< 2000	< 2000								1524
87	5	30:53													1499	1474
148	6	30:54		< 2000	< 2000	< 2000	< 2000	< 2000								1244
81	4	31:02		3628	4667	3822	3198	4125		1.8	2294	2002	1673	2.1		1965
85	5	31:14		< 2000	< 2000	< 2000	< 2000	< 2000								1739
120	5	31:14													1739	1739
136	6	31:26		< 2000	< 2000	< 2000	< 2000	< 2000								1700
154	6	31:38		< 2000	< 2000	< 2000	< 2000	< 2000								1326
110	5	31:41		< 2000	< 2000	< 2000	< 2000	< 2000								1853
77	4	31:58		< 2000	< 2000	< 2000	< 2000	< 2000								1831
82	5	32:40		< 2000	< 2000	< 2000	< 2000	< 2000								1298
151	6	32:43		< 2000	< 2000	< 2000	< 2000	< 2000								1241
135	6	33:03		< 2000	< 2000	< 2000	< 2000	< 2000								1171
144	6	33:11		< 2000	< 2000	< 2000	< 2000	< 2000								1293
147	6	33:23		< 2000	< 2000	< 2000	< 2000	< 2000								1157
124	5	33:30		< 2000	< 2000	< 2000	< 2000	< 2000								1886
108	5	33:39														1762
107	5	33:45		< 2000	< 2000	< 2000	< 2000	< 2000								1756
123	5	33:53													1668	1485
139	6	33:49		< 2000	< 2000	< 2000	< 2000	< 2000								1295
149	6	33:49													1295	1295
140	6	34:08		< 2000	< 2000	< 2000	< 2000	< 2000								1186
106	5	34:10		< 2000	< 2000	< 2000	< 2000	< 2000								1828
118	5	34:14													1797	1766
143	6	34:36		< 2000	< 2000	< 2000	< 2000	< 2000								1199
134	6	34:43													1062	925
142	6	35:01		< 2000	< 2000	< 2000	< 2000	< 2000								1142
131	6	35:09		< 2000	< 2000	< 2000	< 2000	< 2000								946
114	5	35:11		< 2000	< 2000	< 2000	< 2000	< 2000								1852
133	6	35:14		< 2000	< 2000	< 2000	< 2000	< 2000								1170
165	6	35:17													1356	1541
122	5	35:20		< 2000	< 2000	< 2000	< 2000	< 2000								1875
188	7	35:22	INJ	151837	152115	149728	146545	157706								1383
146	6	35:38		< 2000	< 2000	< 2000	< 2000	< 2000								1180

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
Blanks reflect the ASE sequential processing steps: Extraction **SOL**vent, concentrating etc; **SYS**tem processing on previously extrac
Ottawa Sa**ND** taken thru all the handling steps (weighing, transfer, REC cmpd addition, etc.) and finally, **INJ** cmpd addition to JT Ba
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

Ultra Scientific EPA Congener Calibration Std.							
50	100	100	50				
pg/µL						Accustandard	
					EPA Average	PCB mixes	
1119EPA	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
82225	159698	186977	89631		1726	1831	
81465	163852	180841	90267		1720	1766	

Accelerated Solvent Extract Blanks
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014

Client: SEE, LLC

MIT PRoject Number: 6931411

Recovery compound added	**100000** pg
Injection compound added	**100000** pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners

(once the Accustandard mixes are adjusted for varying concentrations within solutions)

Blanks reflect the ASE sequential processing steps: Extraction **SOL**vent, concentrating etc; **SYS**tem processing on previously extrac

Ottawa Sa**ND** taken thru all the handling steps (weighing, transfer, REC cmpd addition, etc.) and finally, **INJ** cmpd addition to JT Ba

Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED

A 2000 area count criteria was used as the minimum for peak reporting.

Congener response factor variations and masses of PE result in variations in the MDL.

Recovery Cmpd	# Cl	R.T. (**min**)		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**	r.f. (area/pg)
				AREA COUNTS / µL INJECTED											
13C PCB 19	3	15:35				103349	102888					0.97	0.99		1070
13C PCB 52	4	21:48				113219	111404					0.97	0.98		1169
13C PCB 105	5	36:39				140492	138748					1.03	1.03		1379
13C PCB167	6	41:52				124653	120100					1.00	0.99		1249
13C PCB 194	8	55:23				72843	78785					0.91	1.00		806
									AVE frac. recov'd			0.98	1.00		
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)
d17-39	3	21:36		215123	226156	205448	213272	219523		1047	996	1096	1056	1026	2252
d22-104	5	22:33		185540	194046	186125	176376	193581		1035	990	1032	1089	992	1920
d34-55	4	27:05		191400	199237	201880	198583	204355		1046	1004	991	1008	979	2001
d40-150	6	29:27		169707	179424	169347	160085	177271		985	931	987	1044	943	1671
d52-188	7	35:20		151837	152115	149728	146545	157706		911	909	923	944	877	1383
									AVE. Calc'd Vol (µL)	1005	966	1006	1028	963	

Congener No.	# Cl	R.T. (**min**)		Blanks - Accelerated Solvent Extracts						Blanks - Accelerated Solvent Extracts						
				1119ASIN	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		
				1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.		Accustandard
2	1										NO Handling		Weighing etc.	Reinjection	Coelution	PCB mixes
1	1			AREA COUNTS / µL INJECTED						Inj Cmpd	Ottawa Sand	Solvent	Ottawa Sand	Inj. Cmpd	AVE r.f.	r.f. (area cts/pg)
161	6	35:38		< 2000	< 2000	< 2000	< 2000	< 2000							1400	1620
184	7	36:06		< 2000	< 2000	< 2000	< 2000	< 2000								1448
153	6	36:17	PRC	< 2000	< 2000	< 2000	< 2000	< 2000								1463
132	6	36:18													1526	1590
168	6	36:25		< 2000	< 2000	< 2000	< 2000	< 2000								1212
105	5	36:39		< 2000	< 2000	< 2000	< 2000	< 2000								1771
127	5	36:50		< 2000	< 2000	< 2000	< 2000	< 2000								1867
179	7	37:28		< 2000	< 2000	< 2000	< 2000	< 2000								1410
141	6	37:31		< 2000	< 2000	< 2000	< 2000	< 2000								1115
137	6	38:02		< 2000	< 2000	< 2000	< 2000	< 2000								1237
176	7	38:13		< 2000	< 2000	< 2000	< 2000	< 2000								1445
130	6	38:17		< 2000	< 2000	< 2000	< 2000	< 2000								1154
164	6	38:41		< 2000	< 2000	< 2000	< 2000	< 2000								1448
163	6	38:43													1406	1364
138	6	38:54		< 2000	< 2000	< 2000	< 2000	< 2000								1259
160	6	38:54													1390	1522
158	6	39:02		< 2000	< 2000	< 2000	< 2000	< 2000								1534
186	7	39:03		< 2000	< 2000	< 2000	< 2000	< 2000								1410
178	7	39:29	PRC	< 2000	< 2000	< 2000	< 2000	< 2000								1038
129	6	39:33		< 2000	< 2000	< 2000	< 2000	< 2000								1177
126	5	40:00		< 2000	< 2000	< 2000	< 2000	< 2000								1691
175	7	40:04		< 2000	< 2000	< 2000	< 2000	< 2000								1069
166	6	40:11		< 2000	< 2000	< 2000	< 2000	< 2000								1620
182	7	40:23		< 2000	< 2000	< 2000	< 2000	< 2000								1006
187	7	40:23													1064	1123
159	6	40:42		< 2000	< 2000	< 2000	< 2000	< 2000								1506
183	7	40:55		< 2000	< 2000	< 2000	< 2000	< 2000								1146
162	6	41:14		< 2000	< 2000	< 2000	< 2000	< 2000								1548
128	6	41:31		< 2000	< 2000	< 2000	< 2000	< 2000								1126
167	6	41:52		< 2000	< 2000	< 2000	< 2000	< 2000								1560
185	7	42:02		< 2000	< 2000	< 2000	< 2000	< 2000								1059
174	7	42:45		< 2000	< 2000	< 2000	< 2000	< 2000								948
181	7	42:51													1009	1070
177	7	43:15		< 2000	< 2000	< 2000	< 2000	< 2000								970
202	8	43:31		cutoff switching ion groups												0
171	7	43:45		< 2000	< 2000	< 2000	< 2000	< 2000								1017
156	6	44:06		< 2000	< 2000	< 2000	< 2000	< 2000								1514
173	7	44:16		< 2000	< 2000	< 2000	< 2000	< 2000								829
201	8	44:21		< 2000	< 2000	< 2000	< 2000	< 2000								1338
157	6	44:33		< 2000	< 2000	< 2000	< 2000	< 2000								1456
204	8	44:36		< 2000	< 2000	< 2000	< 2000	< 2000								1276
192	7	44:56		< 2000	< 2000	< 2000	< 2000	< 2000								1190
172	7	45:02													1072	955
197	8	45:12		< 2000	< 2000	< 2000	< 2000	< 2000								1299
180	7	45:45		< 2000	< 2000	< 2000	< 2000	< 2000								884
193	7	45:48													1033	1182
191	7	46:13		< 2000	< 2000	< 2000	< 2000	< 2000								1226
200	8	46:50		< 2000	< 2000	< 2000	< 2000	< 2000								1300

Ultra Scientific EPA Congener Calibration Std.

	50	100	100	50		
	pg/µL					Accustandard
					EPA Average	PCB mixes
	1119EPA	**1119EPA1**	**1119EP1A**	**1119EPA2**	r.f. (area cts/pg)	r.f. (area cts/pg)
153	63706	118296	130653	66712	1274	1463
138	57051	110291	126446	57971	1167	1259
126	69002	143472	159108	79953	1501	1691
128	51337	99017	111026	52127	1042	1126
105	75769	157350	177678	83989	1636	1771
174	948					

Accelerated Solvent Extract Blanks
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014

Client: SEE, LLC

MIT PRoject Number: 6931411

Recovery compound added	**100000** pg
Injection compound added	**100000** pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners

(once the Accustandard mixes are adjusted for varying concentrations within solutions)

Blanks reflect the ASE sequential processing steps: Extraction **SOL**vent, concentrating etc; **SYS**tem processing on previously extrac

Ottawa Sa**ND** taken thru all the handling steps (weighing, transfer, REC cmpd addition, etc.) and finally, **INJ** cmpd addition to JT Ba

Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/µL] * [total Xtr. Vol. (µL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED

A 2000 area count criteria was used as the minimum for peak reporting.

Congener response factor variations and masses of PE result in variations in the MDL.

			Blanks - Accelerated Solvent Extracts						Blanks - Accelerated Solvent Extracts							
Recovery Cmpd	# Cl	R.T. (min)	**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**			
			AREA COUNTS / µL INJECTED											r.f. (area/pg)		
13C PCB 19	3	15:35			103349	102888					0.97	0.99		1070		
13C PCB 52	4	21:48			113219	111404					0.97	0.98		1169		
13C PCB 105	5	36:39			140492	138748					1.03	1.03		1379		
13C PCB167	6	41:52			124653	120100					1.00	0.99		1249		
13C PCB 194	8	55:23			72843	78785					0.91	1.00		806		
								AVE frac. recov'd			0.98	1.00				
Injection Cmpd			AREA COUNTS / µL INJECTED											r.f. (area/pg)		
d17-39	3	21:36	215123	226156	205448	213272	219523		1047	996	1096	1056	1026	2252		
d22-104	5	22:33	185540	194046	186125	176376	193581		1035	990	1032	1089	992	1920		
d34-55	4	27:05	191400	199237	201880	198583	204355		1046	1004	991	1008	979	2001		
d40-150	6	29:27	169707	179424	169347	160085	177271		985	931	987	1044	943	1671		
d52-188	7	35:20	151837	152115	149728	146545	157706		911	909	923	944	877	1383		
								AVE. Calc'd Vol (µL)	1005	966	1006	1028	963			

			Blanks - Accelerated Solvent Extracts						Blanks - Accelerated Solvent Extracts							
Congener No.	# Cl	R.T. (min)	**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**		**1119ASIN**	**1119ASYS**	**1119SOL**	**1119ASND**	**1119ASI1**			
			1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.	1mL extr. Vol.		Accustandard	
2	1									NO Handling		Weighing etc.	Reinjection	Coelution	PCB mixes	
1	1		AREA COUNTS / µL INJECTED						Inj Cmpd	Ottawa Sand	Solvent	Ottawa Sand	Inj. Cmpd	AVE r.f.	r.f. (area cts/pg)	
169	6	48:03	< 2000	< 2000	< 2000	< 2000	< 2000								1327	
170	7	48:39	< 2000	< 2000	< 2000	< 2000	< 2000								2164	
190	7	48:39												2164	2164	
198	8	49:05	< 2000	< 2000	< 2000	< 2000	< 2000								906	
199	8	49:23	< 2000	< 2000	< 2000	< 2000	< 2000								929	
203	8	50:01	< 2000	< 2000	< 2000	< 2000	< 2000								987	
196	8	50:03												967	946	
189	7	51:49	< 2000	< 2000	< 2000	< 2000	< 2000								1120	
208	9	52:52	< 2000	< 2000	< 2000	< 2000	< 2000								1122	
195	8	53:04	< 2000	< 2000	< 2000	< 2000	< 2000								907	
207	9	53:49	< 2000	< 2000	< 2000	< 2000	< 2000								1131	
194	8	55:23	< 2000	< 2000	< 2000	< 2000	< 2000								916	
205	8	55:46	< 2000	< 2000	< 2000	< 2000	< 2000								1055	
206	9	59:05	< 2000	< 2000	< 2000	< 2000	< 2000								794	
209	10	62:13	< 2000	< 2000	< 2000	< 2000	< 2000								988	
									ASE Inj cmpds	**ASE System**	**ASE Solvent**	**ASE Sand**	**ASE Inj cmpds**			
			ASE Inj cmpds	**ASE System**	**ASE Solvent**	**ASE Sand**	**ASE Inj cmpds**									
								SED dry wgt. (g)		1.0000		1.0000				
			02:39	03:50	05:00	06:10	08:35									
			20 Nov	20 Nov	20 Nov	20 Nov	20 Nov									
			Rec/Inj cmpds													
			100pg/uL													
			1119REIN	1119RIN1												
					Ave. r.f.											
13C PCB 19	3	15:35	111218	102687	1070											
13C PCB 52	4	21:48	118136	115693	1169											
13C PCB 105	5	36:39	138976	136742	1379											
13C PCB 167	6	41:52	129358	120345	1249											
13C PCB 194	8	55:23	85115	76171	806											
			08:58	12:29												
			19 Nov	19 Nov												

Ultra Scientific EPA Congener Calibration Std.									
50	100	100	50						
pg/µL							Accustandard		
					EPA Average		PCB mixes		
1119EPA	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)		r.f. (area cts/pg)		
39060	79087	88490	44064		835		2164		
41284	77239	85690	42792		828		907		
39581	74752	79037	39848		782		794		
47910	92028	96371	48464		953		988		
13:40	18:27	11:02	14:33						
19 Nov	19 Nov	20 Nov	20 Nov						

Willamette Sediments
(19 November 2014)

Lower Willamette Rivermile 11E Project — 19 November 2014
Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

				Sediment - Accelerated Solvent Extracts						Recovery compound added		100000	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners							
				Site 04		Site 01				Injection compound added		100000	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**							
		R.T.		**1119SED4**		**1119SE1A**	1119SE1B												SED extracts are not as contaminated as expected therefore							
Recovery Cmpd	# Cl	(**min**)																	Extract volumes calculated from Injection compound additions are as expected.							
				AREA COUNTS / µL INJECTED												r.f. (area/pg)										
13C PCB 19	3	15:35		96318		100412					0.94		0.97			1070										
13C PCB 52	4	21:48		104887		120717					0.94		1.06			1169										
13C PCB 105	5	36:39		131698		136367					1.00		1.02			1379			**sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]**							
13C PCB167	6	41:52		116597		121158					0.98		1.00			1249										
13C PCB 194	8	55:23		67527		73614					0.88		0.94			806										
										AVE fraction recov'd	0.95		1.00						Detection limit: ≥ 1500 pg/ g SED							
Injection Cmpd				AREA COUNTS / µL INJECTED												r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.						
d17-39	3	21:36		218042		222145					1033		1014			2252				Congener response factor variations and masses of PE result in variations in the MDL.						
d22-104	5	22:33		174252		174310					1102		1102			1920										
d34-55	4	27:05		193656		193551					1033		1034			2001										
d40-150	6	29:27		158724		164085					1053		1018			1671										
d52-188	7	35:20		136687		141544					1012		977			1383										
										AVE. Calc'd Vol (uL)	1047		1029													
				Sediment - Accelerated Solvent Extracts							Sediment - Accelerated Solvent Extracts															
				Site 04		Site 01					Site 04		Site 01						Ultra Scientific EPA Congener Calibration Std.							
		R.T.		**1119SED4**		**1119SEDA**	1119SEDB				**1119SED4**		**1119SEDA**	1119SEDB					50	100	100	50				
Congener No.	# Cl	(**min**)		1mL extr. Vol.	approximate	1mL extr. Vol.					1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard		pg/µL						Accustandard	
				AREA COUNTS / µL INJECTED							**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes							EPA Average	PCB mixes	
																AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
2	1																									
1	1																									
3	1																									
4	2	12:55		32270		2411					14316		999				1966								1966	
10	2	12:55														2473	2979								2979	
7	2	13:57		4289		< 2000					1570						2915								2915	
9	2	13:57														2997	3079								3079	
6	2	14:24		< 2000		< 2000					724	U	676	U			3029								3029	
5	2	14:42		4904		< 2000					1772		675	U			2877								2877	
8	2	14:43														3035	3194		133390	269081	280218	141485		2748	3194	
14	2	15:22		< 2000		3991					721	U	1343				3044								3044	
19	3	15:35		64955		2755					48822		1933				1459								1459	
30	3	15:59		< 2000		< 2000					1025	U	957	U			2140								2140	
11	2	16:24		< 2000		< 2000					778	U	727	U			2818								2818	
12	2	16:43		< 2000		< 2000					736	U	687	U			2980								2980	
18	3	16:45		4232		< 2000					3046						1524		69916	134538	147492	73166		1420	1524	
13	2	16:46		< 2000		< 2000					969	U	904	U			2265								2265	
17	3	16:52		42879		< 2000					31106						1512								1512	
15	2	17:07		< 2000		< 2000					720	U	673	U			3045								3045	
27	3	17:16		13677		< 2000					6934		947	U			2173								2173	
24	3	17:20														2164	2154								2154	
16	3	17:48		18995		< 2000					11672		1147	U			1287								1287	
32	3	17:50														1785	2283								2283	
34	3	18:17		< 2000		< 2000					993	U	927	U			2242								2242	
23	3	18:22														2208	2175								2175	
29	3	18:35		< 2000		< 2000					1008	U	942	U			2175								2175	
54	4	18:37	PRC	31671		1278					17754		669				1957								1957	
26	3	18:58		5634		< 2000					2985		989	U			2300								2300	
25	3	19:04														2071	1841								1841	
50	4	19:19		9068		< 2000					6381						1559								1559	
31	3	19:32		15659		< 2000					7393		882	U			2392								2392	
28	3	19:35	PRC													2323	2255		98323	198060	215261	109970		2075	2255	

Willamette Sediments
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Lower Willamette Rivermile 11E Project — 19 November 2014
Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

				Sediment - Accelerated Solvent Extracts						Recovery compound added		100000	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners						
				Site 04		Site 01				Injection compound added		100000	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**						
		R.T.		**1119SED4**		**1119SE1A**	1119SE1B												SED extracts are not as contaminated as expected therefore						
Recovery Cmpd	# Cl	(**min**)																	Extract volumes calculated from Injection compound additions are as expected.						
				AREA COUNTS / µL INJECTED												r.f. (area/pg)									
13C PCB 19	3	15:35		96318		100412					0.94		0.97			1070									
13C PCB 52	4	21:48		104887		120717					0.94		1.06			1169									
13C PCB 105	5	36:39		131698		136367					1.00		1.02			1379			**sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]**						
13C PCB167	6	41:52		116597		121158					0.98		1.00			1249									
13C PCB 194	8	55:23		67527		73614					0.88		0.94			806									
										AVE fraction recov'd	0.95		1.00						Detection limit: ≥ 1500 pg/ g SED						
Injection Cmpd				AREA COUNTS / µL INJECTED												r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.					
d17-39	3	21:36		218042		222145					1033		1014			2252				Congener response factor variations and masses of PE result in variations in the MDL.					
d22-104	5	22:33		174252		174310					1102		1102			1920									
d34-55	4	27:05		193656		193551					1033		1034			2001									
d40-150	6	29:27		158724		164085					1053		1018			1671									
d52-188	7	35:20		136687		141544					1012		977			1383									
										AVE. Calc'd Vol (uL)	1047		1029												
				Sediment - Accelerated Solvent Extracts							Sediment - Accelerated Solvent Extracts														
				Site 04		Site 01					Site 04		Site 01						Ultra Scientific EPA Congener Calibration Std.						
		R.T.		**1119SED4**		**1119SEDA**	1119SEDB				**1119SED4**		**1119SEDA**	1119SEDB					50	100	100	50			
Congener No.	# Cl	(**min**)		1mL extr. Vol.	approximate	1mL extr. Vol.					1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard		pg/µL						Accustandard
				AREA COUNTS / µL INJECTED							**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes						EPA Average		PCB mixes
																AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**	r.f. (area cts/pg)		r.f. (area cts/pg)
21	3	20:04															1769								1769
20	3	20:06		7062		3051					3640		1468				1976								1976
33	3	20:07														2128	2249								2249
53	4	20:04		50895		< 2000					36056		1323	U			1548								1548
51	4	20:25		92391		3124					64041		2022				1583								1583
22	3	20:39		< 2000		< 2000					1001	U	934	U			2192								2192
45	4	20:54		< 2000		< 2000					1544	U	1441	U			1421								1421
36	3	21:06		5041		4713					2380		2078				2323								2323
46	4	21:24		2710		< 2000					2352		1620	U			1264								1264
69	4	21:32		4851		< 2000					3387		1304	U			1571								1571
73	4	21:36		6425		< 2000					3589		1043	U			1964								1964
39	3	21:43	INJ	218042		222145											2252								2252
52	4	21:48		41706		5166					28811		3332				1588		67228	137666	149074	74358		1425	1588
43	4	21:54		< 2000		< 2000					1675	U	1564	U			1310								1310
49	4	22:06		56924		4365					37567		2690				1662								1662
48	4	22:16															1582								1582
47	4	22:18	PRC	228823		7239					143320		4233				1447								1447
75	4	22:18														1751	2225								2225
38	3	22:19		13209		< 2000					947	U	884	U			2316								2316
65	4	22:26		< 2000		< 2000					1170	U	1093	U			1875								1875
62	4	22:33		< 2000		< 2000					1112	U	1038	U			1974								1974
104	5	22:51	INJ	174252		174310											1920								1920
35	3	23:09		< 2000		< 2000					1051	U	981	U			2088								2088
44	4	23:13		1954		< 2000					1600						1340		59339	121685	129094	65564		1251	1340
59	4	23:21		< 2000		< 2000					1176	U	1098	U			1865								1865
42	4	23:28		< 2000		< 2000					1763	U	1646	U			1244								1244
37	3	23:45		< 2000		< 2000					1116	U	1042	U			1966								1966
72	4	23:58		12830		< 2000					6601		961	U			2160								2160
71	4	24:00														2132	2104								2104
41	4	24:08															1514								1514
64	4	24:11		4536		< 2000					2743		1129	U			1776								1776
68	4	24:13														1814	2152								2152
96	5	24:29		8669		< 2000					5071		1092	U			1875								1875
103	5	24:40		9024		< 2000					6304		1305	U			1570								1570
40	4	24:42		< 2000		< 2000					1949	U	1820	U			1125								1125

Willamette Sediments
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Lower Willamette Rivermile 11E Project — 19 November 2014
Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

				Sediment - Accelerated Solvent Extracts						Recovery compound added		100000	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners							
				Site 04		Site 01				Injection compound added		100000	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**							
		R.T.		**1119SED4**		**1119SE1A**	1119SE1B												SED extracts are not as contaminated as expected therefore							
Recovery Cmpd	# Cl	(**min**)																	Extract volumes calculated from Injection compound additions are as expected.							
				AREA COUNTS / µL INJECTED												r.f. (area/pg)										
13C PCB 19	3	15:35		96318		100412					0.94		0.97			1070										
13C PCB 52	4	21:48		104887		120717					0.94		1.06			1169										
13C PCB 105	5	36:39		131698		136367					1.00		1.02			1379			**sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]**							
13C PCB167	6	41:52		116597		121158					0.98		1.00			1249										
13C PCB 194	8	55:23		67527		73614					0.88		0.94			806										
										AVE fraction recov'd	0.95		1.00						Detection limit: ≥ 1500 pg/ g SED							
Injection Cmpd				AREA COUNTS / µL INJECTED												r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.						
d17-39	3	21:36		218042		222145					1033		1014			2252				Congener response factor variations and masses of PE result in variations in the MDL.						
d22-104	5	22:33		174252		174310					1102		1102			1920										
d34-55	4	27:05		193656		193551					1033		1034			2001										
d40-150	6	29:27		158724		164085					1053		1018			1671										
d52-188	7	35:20		136687		141544					1012		977			1383										
										AVE. Calc'd Vol (uL)	1047		1029													
				Sediment - Accelerated Solvent Extracts							Sediment - Accelerated Solvent Extracts															
				Site 04		Site 01					Site 04		Site 01						Ultra Scientific EPA Congener Calibration Std.							
		R.T.		**1119SED4**		**1119SEDA**	1119SEDB				**1119SED4**		**1119SEDA**	1119SEDB					50	100	100	50				
Congener No.	# Cl	(**min**)		1mL extr. Vol.	approximate	1mL extr. Vol.					1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard		pg/µL						Accustandard	
				AREA COUNTS / µL INJECTED							**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes							EPA Average	PCB mixes	
																AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
57	4	24:55		< 2000		< 2000					1040	U	971	U			2110								2110	
100	5	25:09		37689		3143					27343		2129				1512								1512	
67	4	25:17		< 2000		< 2000					1120	U	1046	U			1958								1958	
58	4	25:26		< 2000		< 2000					1070	U	999	U			2051								2051	
94	5	25:39		4787		< 2000					3933		1534	U			1335								1335	
63	4	25:44		3200		< 2000					1637		955	U			2144								2144	
61	4	25:58		< 2000		< 2000					1181	U	1102	U			1858								1858	
74	4	26:04		< 2000		< 2000					1136	U	1061	U			1931								1931	
98	5	26:16		5576		< 2000					4790		1604	U			1307								1307	
102	5	26:16														1277	1247								1247	
76	4	26:19		< 2000		< 2000					1197	U	1117	U			1833								1833	
70	4	26:26		3507		< 2000					2216		1180	U			1736								1736	
93	5	26:26		< 2000		< 2000					1816	U	1696	U			1208								1208	
95	5	26:33		31736		8202					21203		5116				1458								1458	
121	5	26:34														1642	1825								1825	
66	4	26:38		4318		< 2000					2230		964	U			2204		83794	178074	187441	95438		1810	2204	
80	4	26:40														2124	2044								2044	
88	5	26:46		< 2000		< 2000					1598	U	1492	U			1373								1373	
91	5	27:05		28648		3423					21961		2450				1431								1431	
55	4	27:18	INJ	193656		193551											2001								2001	
155	6	27:37		< 2000		< 2000					1275	U	1190	U			1721								1721	
56	4	27:57		< 2000		< 2000					1076	U	1005	U			2009								2009	
60	4	28:03														2039	2069								2069	
92	5	28:02		6306		< 2000					5116		1515	U			1352								1352	
84	5	28:18		2892		< 2000					2695		1740	U			1177								1177	
90	5	28:27		41394		9779					32703		7213				1378								1378	
89	5	28:29															1351								1351	
101	5	28:34														1388	1437		63326	128732	145393	69428		1349	1437	
113	5	28:40		< 2000		< 2000					1234	U	1152	U			1778								1778	
99	5	28:57		12471		2479					8823		1638				1550								1550	
79	4	29:18		< 2000		< 2000					1078	U	1006	U			2036								2036	
119	5	29:27		11183		4276					6222		2221	ion overlap from Inj. Cmpd. ?			1971								1971	
150	**6**	**29:29**	**INJ**	158724		164085											1671								1671	
112	5	29:34		< 2000		< 2000					1275	U	1191	U			1720								1720	
83	5	29:48		< 2000		< 2000					1818	U	1697	U			1207								1207	

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MIT PRoject Number: 6931411
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				Sediment - Accelerated Solvent Extracts					Recovery compound added		100000	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners							
				Site 04		Site 01			Injection compound added		100000	pg						(once the Accustandard mixes are adjusted for varying concentrations within solutions)							
		R.T.		1119SED4		1119SE1A	1119SE1B											SED extracts are not as contaminated as expected therefore							
Recovery Cmpd	# Cl	(min)																Extract volumes calculated from Injection compound additions are as expected.							
				AREA COUNTS / µL INJECTED											r.f. (area/pg)										
13C PCB 19	3	15:35		96318		100412				0.94		0.97			1070										
13C PCB 52	4	21:48		104887		120717				0.94		1.06			1169										
13C PCB 105	5	36:39		131698		136367				1.00		1.02			1379			**sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]**							
13C PCB167	6	41:52		116597		121158				0.98		1.00			1249										
13C PCB 194	8	55:23		67527		73614				0.88		0.94			806										
									AVE fraction recov'd	0.95		1.00						Detection limit: ≥ 1500 pg/ g SED							
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)				A 2000 area count criteria was used as the minimum for peak reporting.						
d17-39	3	21:36		218042		222145				1033		1014			2252				Congener response factor variations and masses of PE result in variations in the MDL.						
d22-104	5	22:33		174252		174310				1102		1102			1920										
d34-55	4	27:05		193656		193551				1033		1034			2001										
d40-150	6	29:27		158724		164085				1053		1018			1671										
d52-188	7	35:20		136687		141544				1012		977			1383										
									AVE. Calc'd Vol (uL)	1047		1029													
				Sediment - Accelerated Solvent Extracts						Sediment - Accelerated Solvent Extracts															
				Site 04		Site 01				Site 04		Site 01						Ultra Scientific EPA Congener Calibration Std.							
		R.T.		1119SED4		1119SEDA	1119SEDB			1119SED4		1119SEDA	1119SEDB					50	100	100	50				
Congener No.	# Cl	(min)		1mL extr. Vol.	approximate	1mL extr. Vol.				1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard		pg/µL						Accustandard	
				AREA COUNTS / µL INJECTED						**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes							EPA Average	PCB mixes	
															AVE r.f.	r.f. (area cts/pg)		**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
109	5	29:48		< 2000		< 2000				1221	U	1140	U		1502	1797								1797	
152	6	30:04		2411		< 2000				1602						1651								1651	
78	4	30:09		< 2000		< 2000				990	U	924	U			2216								2216	
97	5	30:18	PRC													1162								1162	
86	5	30:20		3686		< 2000				2899		1469	U			1210								1210	
125	5	30:24													1395	1811								1811	
117	5	30:40														1821								1821	
116	5	30:42		3457		< 2000				2067		1117	U			1669								1669	
111	5	30:44	PRC												1834	2012								2012	
145	6	30:42		< 2000		< 2000				1339	U	1251	U			1638								1638	
115	5	30:51		4104		< 2000				3003		1366	U			1524								1524	
87	5	30:53													1499	1474								1474	
148	6	30:54		< 2000		< 2000				1764	U	1647	U			1244								1244	
81	4	31:02		4878		4555				2722		2374				1965								1965	
85	5	31:14		< 2000		< 2000				1262	U	1178	U			1739								1739	
120	5	31:14													1739	1739								1739	
136	6	31:26		20789		5458				13417		3289				1700								1700	
154	6	31:38		5813		< 2000				4809						1326								1326	
110	5	31:41		18800		6329				11128		3498				1853								1853	
77	4	31:58		< 2000		< 2000				1198	U	1118	U			1831		82225	159698	186977	89631		1726	1831	
82	5	32:40		2309		< 2000				1952						1298								1298	
151	6	32:43		24670		7464				21801		6158				1241								1241	
135	6	33:03		9110		3376				8533		2952				1171								1171	
144	6	33:11		3834		< 2000				3254						1293								1293	
147	6	33:23		17571		2388				16659		2114				1157								1157	
124	5	33:30		< 2000		< 2000				1163	U	1086	U			1886								1886	
108	5	33:39														1762								1762	
107	5	33:45		4954		< 2000				3259		1228				1756								1756	
123	5	33:53													1668	1485								1485	
139	6	33:49		62584		19942				53020		15774				1295								1295	
149	6	33:49													1295	1295								1295	
140	6	34:08		< 2000		< 2000				1849	U	1727	U			1186								1186	
106	5	34:10		8251		4065				5036		2317				1828								1828	
118	5	34:14													1797	1766		81465	163852	180841	90267		1720	1766	
143	6	34:36		2843		< 2000				2027						1199								1199	

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				Sediment - Accelerated Solvent Extracts						Recovery compound added		100000	pg					Notes:	20 PCB congener analyses to affirm r.f's for all 209 congeners						
				Site 04		Site 01				Injection compound added		100000	pg						**(once the Accustandard mixes are adjusted for varying concentrations within solutions)**						
		R.T.		**1119SED4**		**1119SE1A**	1119SE1B												SED extracts are not as contaminated as expected therefore						
Recovery Cmpd	# Cl	(**min**)																	Extract volumes calculated from Injection compound additions are as expected.						
				AREA COUNTS / µL INJECTED											r.f. (area/pg)										
13C PCB 19	3	15:35		96318		100412					0.94		0.97		1070										
13C PCB 52	4	21:48		104887		120717					0.94		1.06		1169										
13C PCB 105	5	36:39		131698		136367					1.00		1.02		1379			**sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]**						
13C PCB167	6	41:52		116597		121158					0.98		1.00		1249										
13C PCB 194	8	55:23		67527		73614					0.88		0.94		806										
										AVE fraction recov'd	0.95		1.00						Detection limit:	≥ 1500 pg/ g SED					
Injection Cmpd				AREA COUNTS / µL INJECTED											r.f. (area/pg)					A 2000 area count criteria was used as the minimum for peak reporting.					
d17-39	3	21:36		218042		222145					1033		1014		2252					Congener response factor variations and masses of PE result in variations in the MDL.					
d22-104	5	22:33		174252		174310					1102		1102		1920										
d34-55	4	27:05		193656		193551					1033		1034		2001										
d40-150	6	29:27		158724		164085					1053		1018		1671										
d52-188	7	35:20		136687		141544					1012		977		1383										
										AVE. Calc'd Vol (uL)	1047		1029												
				Sediment - Accelerated Solvent Extracts							Sediment - Accelerated Solvent Extracts														
				Site 04		Site 01					Site 04		Site 01					Ultra Scientific EPA Congener Calibration Std.						
		R.T.		**1119SED4**		**1119SEDA**	1119SEDB				**1119SED4**		**1119SEDA**	1119SEDB				50	100	100	50				
Congener No.	# Cl	(**min**)		1mL extr. Vol.	approximate	1mL extr. Vol.					1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard	pg/µL						Accustandard	
				AREA COUNTS / µL INJECTED							**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes						EPA Average	PCB mixes	
																AVE r.f.	r.f. (area cts/pg)	**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
134	6	34:43		2843		< 2000					2937					1062	925							925	
142	6	35:01		2738		< 2000					2630						1142							1142	
131	6	35:09		< 2000		< 2000					2320	U	2166	U			946							946	
114	5	35:11		< 2000		< 2000					1184	U	1106	U			1852							1852	
133	6	35:14		< 2000		< 2000					1618	U	1511	U			1170							1170	
165	6	35:17														1356	1541							1541	
122	5	35:20		44078		47792					25791		26109	ion overlap from Inj. Cmpd. ?			1875							1875	
188	7	35:22	INJ	136687		141544											1383							1383	
146	6	35:38		11509		3611					9018		2642				1180							1180	
161	6	35:38														1400	1620							1620	
184	7	36:06		< 2000		< 2000					1515	U	1415	U			1448							1448	
153	6	36:17	PRC	80970		30268					58185		20308				1463	63706	118296	130653	66712		1274	1463	
132	6	36:18														1526	1590							1590	
168	6	36:25		12946		4588					11718		3877				1212							1212	
105	5	36:39		< 2000		< 2000					1239	U	1156	U			1771	75769	157350	177678	83989		1636	1771	
127	5	36:50		< 2000		< 2000					1175	U	1097	U			1867							1867	
179	7	37:28		18329		6949					14258		5047				1410							1410	
141	6	37:31		13051		5216					12842		4792				1115							1115	
137	6	38:02		< 2000		< 2000					1773	U	1655	U			1237							1237	
176	7	38:13		5278		2495					4007		1768				1445							1445	
130	6	38:17		< 2000		< 2000					1901	U	1775	U			1154							1154	
164	6	38:41		31033		11507					24212		8382				1448							1448	
163	6	38:43														1406	1364							1364	
138	6	38:54		35711		14401					28178		10609				1259	57051	110291	126446	57971		1167	1259	
160	6	38:54														1390	1522							1522	
158	6	39:02		6085		2217					4350		1480				1534							1534	
186	7	39:03		< 2000		< 2000					1556	U	1453	U			1410							1410	
178	7	39:29	PRC	6682		2770					7063		2734				1038							1038	
129	6	39:33		< 2000		< 2000					1864	U	1740	U			1177							1177	
126	5	40:00		< 2000		< 2000					1297	U	1211	U			1691	69002	143472	159108	79953		1501	1691	
175	7	40:04		4034		< 2000					4139						1069							1069	

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			Sediment - Accelerated Solvent Extracts																						
			Site 04		Site 01																				
		R.T.	**1119SED4**		**1119SE1A**	1119SE1B																			
Recovery Cmpd	# Cl	(**min**)																							
			AREA COUNTS / µL INJECTED												r.f. (area/pg)										
13C PCB 19	3	15:35	96318		100412					0.94		0.97			1070										
13C PCB 52	4	21:48	104887		120717					0.94		1.06			1169										
13C PCB 105	5	36:39	131698		136367					1.00		1.02			1379										
13C PCB167	6	41:52	116597		121158					0.98		1.00			1249										
13C PCB 194	8	55:23	67527		73614					0.88		0.94			806										
									AVE fraction recov'd	0.95		1.00													
Injection Cmpd			AREA COUNTS / µL INJECTED												r.f. (area/pg)										
d17-39	3	21:36	218042		222145					1033		1014			2252										
d22-104	5	22:33	174252		174310					1102		1102			1920										
d34-55	4	27:05	193656		193551					1033		1034			2001										
d40-150	6	29:27	158724		164085					1053		1018			1671										
d52-188	7	35:20	136687		141544					1012		977			1383										
									AVE. Calc'd Vol (uL)	1047		1029													

			Sediment - Accelerated Solvent Extracts							Sediment - Accelerated Solvent Extracts														
			Site 04		Site 01					Site 04		Site 01					Ultra Scientific EPA Congener Calibration Std.							
		R.T.	**1119SED4**		**1119SEDA**	1119SEDB				**1119SED4**		**1119SEDA**	1119SEDB				50	100	100	50				
Congener No.	# Cl	(**min**)	1mL extr. Vol.	approximate	1mL extr. Vol.					1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.			Accustandard	pg/µL						Accustandard	
			AREA COUNTS / µL INJECTED							**pg/g Sediment Recovery Corrected**					Coelution	PCB mixes						EPA Average	PCB mixes	
															AVE r.f.	r.f. (area cts/pg)	**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**		r.f. (area cts/pg)	r.f. (area cts/pg)	
166	6	40:11	< 2000		< 2000					1354	U	1264	U			1620							1620	
182	7	40:23	37990		17604					39148		16937				1006							1006	
187	7	40:23													1064	1123	48554	99134	103709	50904		1004	1123	
159	6	40:42	< 2000		< 2000					1457	U	1360	U			1506							1506	
183	7	40:55	17522		8090					16770		7229				1146							1146	
162	6	41:14	< 2000		< 2000					1418	U	1324	U			1548							1548	
128	6	41:31	4032		< 2000					3926						1126	51337	99017	111026	52127		1042	1126	
167	6	41:52	2411		< 2000					1695						1560							1560	
185	7	42:02	< 2000		< 2000					2072	U	1934	U			1059							1059	
174	7	42:45	26066		12752					28339		12944				948							948	
181	7	42:51													1009	1070							1070	
177	7	43:15	16185		7072					18296		7464				970							970	
202	8	43:31	cutoff switching ion groups													0							0	
171	7	43:45	6639		3152					7160		3174				1017							1017	
156	6	44:06	4234		< 2000					3068						1514							1514	
173	7	44:16	< 2000		< 2000					2647	U	2471	U			829							829	
201	8	44:21	5051		< 2000					4140						1338							1338	
157	6	44:33	< 2000		< 2000					1507	U	1407	U			1456							1456	
204	8	44:36	< 2000		< 2000					1719	U	1605	U			1276							1276	
192	7	44:56	4877		2375					4989		2268				1190							1190	
172	7	45:02													1072	955							955	
197	8	45:12	< 2000		< 2000					1689	U	1577	U			1299							1299	
180	7	45:45	70907		32088					75323		31825				884	46615	90657	100649	48875		956	884	
193	7	45:48													1033	1182							1182	
191	7	46:13	< 2000		< 2000					1790	U	1671	U			1226							1226	
200	8	46:50	< 2000		< 2000					1687	U	1575	U			1300							1300	
169	6	48:03	< 2000		< 2000					1653	U	1543	U			1327							1327	
170	7	48:39	33227		15087					16841		7139				2164	39060	79087	88490	44064		835	2164	
190	7	48:39													2164	2164							2164	
198	8	49:05	< 2000		< 2000					2421	U	2260	U			906							906	
199	8	49:23	13576		8680					16023		9565				929							929	
203	8	50:01	19182		10036					21764		10632				987							987	
196	8	50:03													967	946							946	

	Recovery compound added	**100000**	pg
	Injection compound added	**100000**	pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

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Client: SEE, LLC
MIT PRoject Number: 6931411
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Recovery compound added	100000 pg
Injection compound added	100000 pg

			Sediment - Accelerated Solvent Extracts					
			Site 04	Site 01				
Recovery Cmpd	# Cl	R.T. (**min**)	**1119SED4**	**1119SE1A**	1119SE1B			
			AREA COUNTS / µL INJECTED					r.f. (area/pg)
13C PCB 19	3	15:35	96318	100412		0.94	0.97	1070
13C PCB 52	4	21:48	104887	120717		0.94	1.06	1169
13C PCB 105	5	36:39	131698	136367		1.00	1.02	1379
13C PCB167	6	41:52	116597	121158		0.98	1.00	1249
13C PCB 194	8	55:23	67527	73614		0.88	0.94	806
					AVE fraction recov'd	0.95	1.00	
Injection Cmpd			AREA COUNTS / µL INJECTED					r.f. (area/pg)
d17-39	3	21:36	218042	222145		1033	1014	2252
d22-104	5	22:33	174252	174310		1102	1102	1920
d34-55	4	27:05	193656	193551		1033	1034	2001
d40-150	6	29:27	158724	164085		1053	1018	1671
d52-188	7	35:20	136687	141544		1012	977	1383
					AVE. Calc'd Vol (uL)	1047	1029	

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

			Sediment - Accelerated Solvent Extracts			Sediment - Accelerated Solvent Extracts						Ultra Scientific EPA Congener Calibration Std.					
			Site 04	Site 01		Site 04		Site 01				50	100	100	50		
Congener No.	# Cl	R.T. (**min**)	**1119SED4**	**1119SEDA**	1119SEDB	**1119SED4**		**1119SEDA**	1119SEDB		Accustandard	pg/µL					Accustandard
			1mL extr. Vol.	1mL extr. Vol.		1mL extr. Vol.	approximate	1mL extr. Vol.	1mL extr. Vol.	Coelution	PCB mixes					EPA Average	PCB mixes
			AREA COUNTS / µL INJECTED			**pg/g Sediment Recovery Corrected**				AVE r.f.	r.f. (area cts/pg)	**1119EPA**	**1119EPA1**	**1119EP1A**	**1119EPA2**	r.f. (area cts/pg)	r.f. (area cts/pg)
189	7	51:49	< 2000	< 2000		1959	U	1829	U		1120						1120
208	9	52:52	< 2000	< 2000		1955	U	1825	U		1122						1122
195	8	53:04	8923	5113		10797		5776			907	41284	77239	85690	42792	828	907
207	9	53:49	< 2000	< 2000		1939	U	1810	U		1131						1131
194	8	55:23	16235	9156		19436		10234			916						916
205	8	55:46	< 2000	< 2000		2079	U	1941	U		1055						1055
206	9	59:05	4102	2416		5669		3118			794	39581	74752	79037	39848	782	794
209	10	62:13	< 2000	< 2000		2221	U	2074	U		988	47910	92028	96371	48464	953	988
						Site 04		**Site 01 - A**	Site 01 - B								
			Site 04	**Site 01 - A**	Site 01 - B							13:40	18:27	11:02	14:33		
						SED dry wgt. (g) 1.0075		1.0079	1.0086			19 Nov	19 Nov	20 Nov	20 Nov		
		SED dry wgt. (g)	1.0075	1.0079	1.0086												

Rec/Inj cmpds			1119REIN	1119RIN1	
100pg/uL					Ave. r.f.
13C PCB 19	3	15:35	111218	102687	1070
13C PCB 52	4	21:48	118136	115693	1169
13C PCB 105	5	36:39	138976	136742	1379
13C PCB 167	6	41:52	129358	120345	1249
13C PCB 194	8	55:23	85115	76171	806
			08:58	12:29	
			19 Nov	19 Nov	

Lower Willamette Sediment
November 21, 2014

Lower Willamette Rivermile 11E Project — 19 November 2014
Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

Recovery compound added: **100000** pg
Injection compound added: **100000** pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore concentration of Site 1 extracts necessary.
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

Recovery Cmpd	# Cl	R.T. (min)	Sediment - Accelerated Solvent Extracts: Site 01 **1121SEDA**	Site 01 **1121SEDB**	r.f. (area/pg)
			AREA COUNTS / µL INJECTED		
13C PCB 19	3	15:35	406454	377413	978
13C PCB 52	4	21:48	484744	456596	1055
13C PCB 105	5	36:39	590501	560774	1251
13C PCB167	6	41:52	500999	503702	1180
13C PCB 194	8	55:23	296165	306339	762

Injection Cmpd	# Cl	R.T. (min)	Sediment - Accelerated Solvent Extracts: Site 01 **1121SEDA**	Site 01 **1121SEDB**	r.f. (area/pg)
			AREA COUNTS / µL INJECTED		
d17-39	3	21:36	945529	897118	2252
d22-104	5	22:33	738633	689870	1920
d34-55	4	27:05	845486	775742	2001
d40-150	6	29:27	689072	645637	1671
d52-188	7	35:20	612210	578522	1383

	Site 01 **1121SEDA**	Site 01 **1121SEDB**
AVE fraction recov'd	1.04	1.08
AVE. Calc'd Vol (uL)	**241**	**257**

SEDIMENT-01 A and B EXTRACTS

Congener No.	# Cl	R.T. (min)	Sediment - Accelerated Solvent Extracts: Site 01 **1121SEDA** 200µL extr. Vol.	Site 01 **1121SEDB** 200µL extr. Vol.	approximate	Sediment - Accelerated Solvent Extracts: Site 01 **1121SEDA** 200µL extr. Vol.		Site 01 **1121SEDB** 200µL extr. Vol.		Coelution	Accustandard PCB mixes r.f. (area cts/pg)
2	1										
1	1		**AREA COUNTS / µL INJECTED**			**pg/g Sediment Recovery Corrected**				AVE r.f.	
3	1										
4	2	12:55	3834	7859		356		752			1966
10	2	12:55								2473	2979
7	2	13:57	< 2000	< 2000		153	U	155	U		2915
9	2	13:57								2997	3079
6	2	14:24	< 2000	< 2000		152	U	155	U		3029
5	2	14:42	< 2000	< 2000		151	U	151	U		2877
8	2	14:43								3035	3194
14	2	15:22	13424	12318		1013		957			3044
19	3	15:35	8426	10559		1326		1712			1459
30	3	15:59	< 2000	< 2000		215	U	221			2140
11	2	16:24	< 2000	< 2000		163	U	168			2818
12	2	16:43	< 2000	< 2000		154	U	159			2980
18	3	16:45	< 2000	< 2000		301	U	310			1524
13	2	16:46	< 2000	< 2000		203	U	209			2265
17	3	16:52	3036	5171		461		809			1512
15	2	17:07	< 2000	< 2000		151	U	155	U		3045
27	3	17:16	3087	4548		328		497			2173
24	3	17:20								2164	2154
16	3	17:48	4397	6471		566		858			1287
32	3	17:50								1785	2283
34	3	18:17	< 2000	< 2000		208	U	214	U		2242
23	3	18:22								2208	2175
29	3	18:35	< 2000	< 2000		211	U	217	U		2175
54	4	18:37	PRC 3363	3299		395		399			1957
26	3	18:58	< 2000	< 2000		222	U	228	U		2300
25	3	19:04								2071	1841
50	4	19:19	< 2000	< 2000		295	U	304	U		1559
31	3	19:32	3877	< 2000		383					2392
28	3	19:35	PRC							2323	2255
21	3	20:04									1769
20	3	20:06	6005	7302		648		812			1976
33	3	20:07								2128	2249
53	4	20:04	14581	12438		2163		1900			1548
51	4	20:25	12652	10483		1836		1567			1583
22	3	20:39	< 2000	< 2000		210	U	216	U		2192
45	4	20:54	< 2000	< 2000		323	U	301	U		1421
36	3	21:06	16343	17869		1616		1820			2323
46	4	21:24	< 2000	< 2000		363	U	374	U		1264
69	4	21:32	< 2000	< 2000		292	U	301	U		1571
73	4	21:36	3855	3147		451		379			1964
39	3	21:43	INJ 945529	897118		96418		94231		DO NOT REPORT	2252
52	4	21:48	20005	16459		2894		2452			1588
43	4	21:54	< 2000	< 2000		351	U	361	U		1310
49	4	22:06	17078	13545		2360		1928			1662
48	4	22:16	27436	24071		3598		3252			1582
47	4	22:18	PRC								1447
75	4	22:18								1751	2225
38	3	22:19	< 2000	< 2000		198	U	204	U		2316
65	4	22:26	< 2000	< 2000		245	U	252	U		1875
62	4	22:33	< 2000	< 2000		233	U	240	U		1974
104	5	22:51	INJ 738633	689870		88346		84993		DO NOT REPORT	1920
35	3	23:09	< 2000	< 2000		220	U	227	U		2088
44	4	23:13	< 2000	< 2000		343	U	353	U		1340
59	4	23:21	< 2000	< 2000		246	U	254	U		1865
42	4	23:28	< 2000	< 2000		369	U	380	U		1244
37	3	23:45	< 2000	< 2000		234	U	241	U		1966

Ultra Scientific EPA Congener Calibration Std. (pg/µL): 50, 100, 200, 100

	1121EPA	**1121EPA1**	**1121EPA2**	**1121EP12**	r.f. (area cts/pg) EPA Average	r.f. (area cts/pg) Accustandard PCB mixes
4						1966
10						2979
7						2915
9						3079
6						3029
5						2877
8	135659	270796	650173	270069	2843	3194
14						3044
19						1459
30						2140
11						2818
12						2980
18	69785	134705	333946	136689	1445	1524
13						2265
17						1512
15						3045
27						2173
24						2154
16						1287
32						2283
34						2242
23						2175
29						2175
54						1957
26						2300
25						1841
50						1559
31						2392
28	101068	203608	495755	197987	2129	2255
21						1769
20						1976
33						2249
53						1548
51						1583
22						2192
45						1421
36						2323
46						1264
69						1571
73						1964
39						2252
52	69022	142857	338502	140095	1476	1588
43						1310
49						1662
48						1582
47						1447
75						2225
38						2316
65						1875
62						1974
104						1920
35						2088
44	62129	129110	302221	121518	1315	1340
59						1865
42						1244
37						1966

Sediment Concentration Comparison — pg/g Sediment Recovery Corrected

	Site 01 **1119SEDA** 1mL extr. Vol.	Site 01 **1121SEDA** 200µL extr. Vol.	Site 01 **1121SEDB** 200µL extr. Vol.
	extract analyzed twice		
	dilute	concentrated	
4	999	356	752
10			
7			
9			
6			
5			
8			
14	1343	1013	957
19	1933	1326	1712
30			
11			
12			
18			
13			
17		461	809
15			
27		328	497
24			
16		566	858
32			
34			
23			
29			
54	669	395	399
26			
25			
50			
31			
28			
21			
20		648	812
33			
53		2163	1900
51	2022	1836	1567
22			
45			
36	2078	1616	1820
46			
69			
73		451	379
39			
52	3332	2894	2452
43			
49	2690	2360	1928
48			
47		3598	3252
75			
38			
65			
62			
104			
35			
44			
59			
42			
37			

Lower Willamette Sediment
November 21, 2014

Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

Recovery compound added	100000 pg
Injection compound added	100000 pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore concentration of Site 1 extracts necessary.
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

Recovery Cmpd	# Cl	R.T. (**min**)	Sediment - Accelerated Solvent Extracts, AREA COUNTS / µL INJECTED: Site 01 **1121SEDA**	Site 01 **1121SEDB**		1121SEDA	1121SEDB	r.f. (area/pg)
13C PCB 19	3	15:35	406454	377413		1.00	0.99	978
13C PCB 52	4	21:48	484744	456596		1.11	1.11	1055
13C PCB 105	5	36:39	590501	560774		1.14	1.15	1251
13C PCB167	6	41:52	500999	503702		1.02	1.10	1180
13C PCB 194	8	55:23	296165	306339		0.93	1.03	762
					AVE fraction recov'd	1.04	1.08	

Injection Cmpd	# Cl	R.T. (min)	AREA COUNTS / µL INJECTED: 1121SEDA	1121SEDB		1121SEDA	1121SEDB	r.f. (area/pg)
d17-39	3	21:36	945529	897118		238	251	2252
d22-104	5	22:33	738633	689870		260	278	1920
d34-55	4	27:05	845486	775742		237	258	2001
d40-150	6	29:27	689072	645637		243	259	1671
d52-188	7	35:20	612210	578522		226	239	1383
					AVE. Calc'd Vol (uL)	**241**	**257**	

SEDIMENT-01 A and B EXTRACTS

Ultra Scientific EPA Congener Calibration Std. (50, 100, 200, 100 pg/µL)

Sediment Concentration Comparison

Congener No.	# Cl	R.T. (min)		Sediment - Accelerated Solvent Extracts, AREA COUNTS / µL INJECTED: Site 01 **1121SEDA** 200µL extr. Vol.	Site 01 **1121SEDB** 200µL extr. Vol.	Sediment - Accelerated Solvent Extracts, pg/g Sediment Recovery Corrected: Site 01 **1121SEDA** 200µL extr. Vol.		Site 01 **1121SEDB** 200µL extr. Vol.		approximate	Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)	**1121EPA** (50)	**1121EPA1** (100)	**1121EPA2** (200)	**1121EP12** (100)	EPA Average r.f. (area cts/pg)	Accustandard PCB mixes r.f. (area cts/pg)		pg/g Sediment Recovery Corrected: Site 01 **1119SEDA** 1mL extr. Vol. (extract analyzed twice: dilute)	Site 01 **1121SEDA** 200µL extr. Vol. (concentrated)	Site 01 **1121SEDB** 200µL extr. Vol.
2	1																		2			
1	1																		1			
3	1																		3			
72	4	23:58		5188	3935	559		437				2160						2160	72		559	437
71	4	24:00									2132	2104						2104	71			
41	4	24:08		< 2000	< 2000	253	U	261	U			1514						1514	41			
64	4	24:11										1776						1776	64			
68	4	24:13									1814	2152						2152	68			
96	5	24:29		2787	< 2000	341		224	U			1875						1875	96		341	
103	5	24:40		4521	3105	661		468				1570						1570	103		661	468
40	4	24:42		< 2000	< 2000	408	U	420	U			1125						1125	40			
57	4	24:55		< 2000	< 2000	218	U	224	U			2110						2110	57			
100	5	25:09		9412	8706	1430		1362				1512						1512	100	2129	1430	1362
67	4	25:17		< 2000	< 2000	235	U	242	U			1958						1958	67			
58	4	25:26		< 2000	< 2000	224	U	231	U			2051						2051	58			
94	5	25:39		< 2000	< 2000	344	U	354	U			1335						1335	94			
63	4	25:44		12180	10122	1305		1117				2144						2144	63		1305	1117
61	4	25:58		< 2000	< 2000	247	U	255	U			1858						1858	61			
74	4	26:04		< 2000	< 2000	238	U	245	U			1931						1931	74			
98	5	26:16		< 2000	< 2000	351	U	362	U			1307						1307	98			
102	5	26:16				368		380			1277	1247						1247	102			
76	4	26:19		< 2000	< 2000	251	U	258	U			1833						1833	76			
70	4	26:26		2977	3881	394		529				1736						1736	70		394	529
93	5	26:26		< 2000	< 2000	380	U	392	U			1208						1208	93			
95	5	26:33		26809	29175	3750		4204				1458						1458	95	5116	3750	4204
121	5	26:34									1642	1825						1825	121			
66	4	26:38		5349	< 2000	578						2204	87775	181843	451516	185279	1921	2204	66			
80	4	26:40									2124	2044						2044	80			
88	5	26:46		< 2000	< 2000	335	U	345	U			1373						1373	88			
91	5	27:05		12562	10605	2016		1753				1431						1431	91	2450	2016	1753
55	4	27:18	INJ	845486	775742	97027		91699		DO NOT REPORT		2001						2001	55			
155	6	27:37		< 2000	< 2000	267	U	275	U			1721						1721	155			
56	4	27:57		< 2000	< 2000	225	U	232	U			2009						2009	56			
60	4	28:03									2039	2069						2069	60			
92	5	28:02		5565	5271	945		922				1352						1352	92		945	922
84	5	28:18		< 2000	2711	390	U	545				1177						1177	84			545
90	5	28:27		37962	39963	6279		6809				1378						1378	90	#VALUE!	6279	6809
89	5	28:29										1351						1351	89			
101	5	28:34									1388	1437	66544	139603	331266	132108	1426	1437	101			
113	5	28:40		< 2000	< 2000	258	U	266	U			1778						1778	113			
99	5	28:57		9352	8396	1385		1281				1550						1550	99	1638	1385	1281
79	4	29:18		5140	5079	580		590				2036						2036	79		580	590
119	5	29:27		< 2000	< 2000	233	U	240	U			1971						1971	119	2221	ion overlap from Inj. Cmpd. ?	
150	**6**	**29:29**	**INJ**	689072	645637	94707		91405		DO NOT REPORT		1671						1671	**150**			
112	5	29:34		< 2000	< 2000	267	U	275	U			1720						1720	112			
83	5	29:48		< 2000	< 2000	306	U	315	U			1207						1207	83			
109	5	29:48									1502	1797						1797	109			
152	6	30:04		< 2000	< 2000	278	U	287	U			1651						1651	152			
78	4	30:09		< 2000	< 2000	207	U	214	U			2216						2216	78			
97	5	30:18	PRC	3146	2533	518		430				1162						1162	97		518	430
86	5	30:20										1210						1210	86			
125	5	30:24									1395	1811						1811	125			
117	5	30:40		< 2000	< 2000	250	U	258	U			1821						1821	117			
116	5	30:42										1669						1669	116			
111	5	30:44	PRC								1834	2012						2012	111			
145	6	30:42		< 2000	< 2000	280	U	289	U			1638						1638	145			
115	5	30:51		5451	5480	835		865				1524						1524	115		835	865
87	5	30:53									1499	1474						1474	87			
148	6	30:54		< 2000	< 2000	369	U	380	U			1244						1244	148			
81	4	31:02		20377	17967	2381		2163				1965						1965	81	2374	2381	2163
85	5	31:14		< 2000	< 2000	264	U	272	U			1739						1739	85			
120	5	31:14									1739	1739						1739	120			
136	6	31:26		21046	20573	2844		2864				1700						1700	136	3289	2844	2864

Lower Willamette Sediment
November 21, 2014

Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

Recovery compound added	100000	pg
Injection compound added	100000	pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore concentration of Site 1 extracts necessary.
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

			Sediment - Accelerated Solvent Extracts				
			Site 01	Site 01			
		R.T.	1121SEDA	1121SEDB			
Recovery Cmpd	# Cl	(min)	AREA COUNTS / µL INJECTED				r.f. (area/pg)
13C PCB 19	3	15:35	406454	377413	1.00	0.99	978
13C PCB 52	4	21:48	484744	456596	1.11	1.11	1055
13C PCB 105	5	36:39	590501	560774	1.14	1.15	1251
13C PCB167	6	41:52	500999	503702	1.02	1.10	1180
13C PCB 194	8	55:23	296165	306339	0.93	1.03	762
				AVE fraction recov'd	1.04	1.08	
Injection Cmpd			AREA COUNTS / µL INJECTED				r.f. (area/pg)
d17-39	3	21:36	945529	897118	238	251	2252
d22-104	5	22:33	738633	689870	260	278	1920
d34-55	4	27:05	845486	775742	237	258	2001
d40-150	6	29:27	689072	645637	243	259	1671
d52-188	7	35:20	612210	578522	226	239	1383
				AVE. Calc'd Vol (uL)	**241**	**257**	

SEDIMENT-01 A and B EXTRACTS

Congener No.	# Cl	R.T. (min)		Sediment - Accelerated Solvent Extracts Site 01 **1121SEDA** 200µL extr. Vol. AREA COUNTS / µL INJECTED	Site 01 **1121SEDB** 200µL extr. Vol.	approximate	Sediment - Accelerated Solvent Extracts Site 01 **1121SEDA** 200µL extr. Vol. pg/g Sediment Recovery Corrected		Site 01 **1121SEDB** 200µL extr. Vol.			Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)	Ultra Scientific EPA Congener Calibration Std. 50 pg/µL **1121EPA**	100 **1121EPA1**	200 **1121EPA2**	100 **1121EP12**	EPA Average r.f. (area cts/pg)	Accustandard PCB mixes r.f. (area cts/pg)		Sediment Concentration Comparison, pg/g Sediment Recovery Corrected: Site 01 **1119SEDA** 1mL extr. Vol. (extract analyzed twice) dilute	Site 01 **1121SEDA** 200µL extr. Vol. concentrated	Site 01 **1121SEDB** 200µL extr. Vol.	
2	1																			2				
1	1																			1				
3	1																			3				
154	6	31:38		2721	2315		471		413				1326						1326	154		471	413	
110	5	31:41		21737	23420		2694		2990				1853						1853	110	3498	2694	2990	
77	4	31:58		< 2000	< 2000		251	U	258	U			1831	79617	160957	427377	187414	1803	1831	77				
82	5	32:40		2452	4118		434		751				1298						1298	82		434	751	
151	6	32:43		28773	29860		5324		5691				1241						1241	151	6158	5324	5691	
135	6	33:03		12435	11586		2439		2340				1171						1171	135	2952	2439	2340	
144	6	33:11		5335	6456		948		1182				1293						1293	144		948	1182	
147	6	33:23		10490	6461		2082		1321				1157						1157	147	2114	2082	1321	
124	5	33:30		< 2000	< 2000		244	U	251	U			1886						1886	124				
108	5	33:39		6263	5550		863		787				1762						1762	108				
107	5	33:45											1756						1756	107				
123	5	33:53										1668	1485						1485	123				
139	6	33:49		84938	88195		15066		16114				1295						1295	139	15774	15066	16114	
149	6	33:49										1295	1295						1295	149				
140	6	34:08		< 2000	< 2000		387	U	399	U			1186						1186	140				
106	5	34:10		11546	10871		1476		1431				1828						1828	106	2317	1476	1431	
118	5	34:14										1797	1766	80808	170459	425225	178893	1809	1766	118				
143	6	34:36		2401	2718		519		606				1199						1199	143		519	606	
134	6	34:43										1062	925						925	134				
142	6	35:01		2590	2193		521		454				1142						1142	142		521	454	
131	6	35:09		< 2000	< 2000		486	U	500	U			946						946	131				
114	5	35:11		< 2000	< 2000		248	U	255	U			1852						1852	114				
133	6	35:14		< 2000	< 2000		339	U	349	U			1170						1170	133				
165	6	35:17										1356	1541						1541	165				
122	5	35:20		interference from injection cmpd			245	U	252	U			1875						1875	122	26109	ion overlap from Inj. Cmpd. ?		
188	7	35:22	INJ	612210	578522		101689		98982		DO NOT REPORT		1383						1383	188				
146	6	35:38		17509	14402		2873		2434				1180						1180	146				
161	6	35:38										1400	1620						1620	161				
184	7	36:06		4728	4607		750		753				1448						1448	184		750	753	
153	6	36:17	PRC	120947	120991		18197		18751				1463	62958	134687	324738	132644	1389	1463	153	20308	18197	18751	
132	6	36:18										1526	1590						1590	132				
168	6	36:25		21538	21488		4082		4195				1212						1212	168	3877	4082	4195	
105	5	36:39		4775	< 2000		619						1771	80226	164106	404481	161745	1721	1771	105		619		
127	5	36:50		< 2000	< 2000		246	U	253	U			1867						1867	127				
179	7	37:28		30593	25005		4983		4195				1410						1410	179	5047	4983	4195	
141	6	37:31		22292	22190		4593		4709				1115						1115	141	4792	4593	4709	
137	6	38:02		< 2000	< 2000		371	U	382	U			1237						1237	137				
176	7	38:13		9638	7552		1532		1236				1445						1445	176	1768	1532	1236	
130	6	38:17		3471	2367		691		485				1154						1154	130		691	485	
164	6	38:41		43463	39046		7100		6570				1448						1448	164	8382	7100	6570	
163	6	38:43										1406	1364						1364	163				
138	6	38:54		57439	63699		9489		10840				1259	59513	121539	294808	119315	1268	1259	138	10609	9489	10840	
160	6	38:54										1390	1522						1522	160				
158	6	39:02		8103	8640		1213		1332				1534						1534	158	1480	1213	1332	
186	7	39:03		< 2000	< 2000		326	U	336	U			1410						1410	186				
178	7	39:29	PRC	10114	8458		2238		1928				1038						1038	178	2734	2238	1928	
129	6	39:33		< 2000	< 2000		390	U	402	U			1177						1177	129				
126	5	40:00		< 2000	< 2000		272	U	280	U			1691	70102	140670	360428	161044	1555	1691	126				
175	7	40:04		< 2000	< 2000		430	U	443	U			1069						1069	175				
166	6	40:11		< 2000	< 2000		283	U	292	U			1620						1620	166				
182	7	40:23		67652	51186		14596		11376				1006						1006	182	16937	14596	11376	
187	7	40:23										1064	1123	52469	105719	259392	104535	1112	1123	187				
159	6	40:42		< 2000	< 2000		305	U	314	U			1506						1506	159				
183	7	40:55		33097	25825		6632		5331				1146						1146	183	7229	6632	5331	
162	6	41:14		< 2000	< 2000		297	U	306	U			1548						1548	162				
128	6	41:31		5813	4950		1185		1040				1126	51301	102115	256426	105214	1095	1126	128		1185	1040	
167	6	41:52		3193	3592		470		545				1560						1560	167		470	545	
185	7	42:02		6660	5426		1445		1212				1059						1059	185		1445	1212	
174	7	42:45		52874	39045		12036		9155				948						948	174	12944	12036	9155	
181	7	42:51										1009	1070						1070	181				

Lower Willamette Sediment
November 21, 2014

Client: SEE, LLC
MIT PRoject Number: 6931411
Willamette River Project

Recovery compound added	**100000** pg
Injection compound added	**100000** pg

Notes: 20 PCB congener analyses to affirm r.f's for all 209 congeners
(once the Accustandard mixes are adjusted for varying concentrations within solutions)
SED extracts are not as contaminated as expected therefore concentration of Site 1 extracts necessary.
Extract volumes calculated from Injection compound additions are as expected.

sample calculation: [area/mL] * [total Xtr. Vol. (mL)] / [congener r.f. (area/pg)] / [Ave. fraction REC] / [SED (g dry wgt.)]

Detection limit: ≥ 1500 pg/ g SED
A 2000 area count criteria was used as the minimum for peak reporting.
Congener response factor variations and masses of PE result in variations in the MDL.

Recovery Cmpd	# Cl	R.T. (**min**)	Sediment - Accelerated Solvent Extracts: Site 01 **1121SEDA** AREA COUNTS / µL INJECTED	Site 01 **1121SEDB** AREA COUNTS / µL INJECTED			r.f. (area/pg)
13C PCB 19	3	15:35	406454	377413	1.00	0.99	978
13C PCB 52	4	21:48	484744	456596	1.11	1.11	1055
13C PCB 105	5	36:39	590501	560774	1.14	1.15	1251
13C PCB167	6	41:52	500999	503702	1.02	1.10	1180
13C PCB 194	8	55:23	296165	306339	0.93	1.03	762
				AVE fraction recov'd	1.04	1.08	

Injection Cmpd	# Cl	R.T. (min)	AREA COUNTS / µL INJECTED (1121SEDA)	AREA COUNTS / µL INJECTED (1121SEDB)			r.f. (area/pg)
d17-39	3	21:36	945529	897118	238	251	2252
d22-104	5	22:33	738633	689870	260	278	1920
d34-55	4	27:05	845486	775742	237	258	2001
d40-150	6	29:27	689072	645637	243	259	1671
d52-188	7	35:20	612210	578522	226	239	1383
				AVE. Calc'd Vol (uL)	**241**	**257**	

SEDIMENT-01 A and B EXTRACTS
Sediment - Accelerated Solvent Extracts

Congener No.	# Cl	R.T. (**min**)	Site 01 **1121SEDA** 200µL extr. Vol. AREA COUNTS / µL INJECTED	Site 01 **1121SEDB** 200µL extr. Vol. AREA COUNTS / µL INJECTED	approximate	Site 01 **1121SEDA** 200µL extr. Vol. pg/g Sediment Recovery Corrected		Site 01 **1121SEDB** 200µL extr. Vol. pg/g Sediment Recovery Corrected		Coelution AVE r.f.	Accustandard PCB mixes r.f. (area cts/pg)
2	1										
1	1										
3	1										
177	7	43:15	29278	19927		6930		4858			970
202	8	43:31	cutoff switching ion groups								0
171	7	43:45	13591	10203		3069		2373			1017
156	6	44:06	7258	5611		1101		877			1514
173	7	44:16	< 2000	< 2000		554	U	571	U		829
201	8	44:21	< 2000	< 2000		343	U	354	U		1338
157	6	44:33	< 2000	< 2000		316	U	325	U		1456
204	8	44:36	< 2000	< 2000		360	U	371	U		1276
192	7	44:56	8923	5824		1911		1285			1190
172	7	45:02								1072	955
197	8	45:12	< 2000	< 2000		354	U	364	U		1299
180	7	45:45	142226	85771		31633		19650			884
193	7	45:48								1033	1182
191	7	46:13	3324	2379		623		459			1226
200	8	46:50	6724	4613		1188		839			1300
169	6	48:03	< 2000	< 2000		346	U	356	U		1327
170	7	48:39	58464	35947		6204		3929			2164
190	7	48:39								2164	2164
198	8	49:05	< 2000	< 2000		507	U	522	U		906
199	8	49:23	27259	15411		6736		3923			929
203	8	50:01	36140	18531		8585		4535			987
196	8	50:03								967	946
189	7	51:49	2946	< 2000		604					1120
208	9	52:52	< 2000	< 2000		409	U	422	U		1122
195	8	53:04	12854	7113		3256		1856			907
207	9	53:49	< 2000	< 2000		406	U	418	U		1131
194	8	55:23	32157	15528		8060		4009			916
205	8	55:46	< 2000	< 2000		435	U	448	U		1055
206	9	59:05	5689	< 2000		1646					794
209	10	62:13	< 2000	< 2000							988
						Site 01 - A		**Site 01 - B**			
			Site 01 - A	**Site 01 - B**							
					SED dry wgt. (g)	1.0079		1.0086			
		SED dry wgt. (g)	1.0079	1.0086							

Ultra Scientific EPA Congener Calibration Std.

Congener No.	50 pg/µL **1121EPA**	100 pg/µL **1121EPA1**	200 pg/µL **1121EPA2**	100 pg/µL **1121EP12**	EPA Average r.f. (area cts/pg)	Accustandard PCB mixes r.f. (area cts/pg)	
2							
1							
3							
177						970	
202						0	
171						1017	
156						1514	
173						829	
201						1338	
157						1456	
204						1276	
192						1190	
172						955	
197						1299	
180	45541	100538	240697	102450	1036	884	
193						1182	
191						1226	
200						1300	
169						1327	
170	41402	83592	209445	85457	891	2164	
190						2164	
198						906	
199						929	
203						987	
196						946	
189						1120	
208						1122	
195	41231	85240	205267	81523	880	907	
207						1131	
194						916	
205						1055	
206	40056	85520	202759	81174	870	794	
209	6869	12772	31705	13798	140	988	Ion drift/bad tune
	16:28	17:39	18:49	00:40			
	21 Nov	21 Nov	21 Nov	22 Nov			

Sediment Concentration Comparison

	Site 01 **1119SEDA** 1mL extr. Vol.	Site 01 **1121SEDA** 200µL extr. Vol.	Site 01 **1121SEDB** 200µL extr. Vol.
	pg/g Sediment Recovery Corrected		
2			
1	extract analyzed twice		
3	dilute	concentrated	
177	7464	6930	4858
202		cutoff switching ion groups	
171	3174	3069	2373
156		1101	877
173			
201			
157			
204			
192	2268	1911	1285
172			
197			
180	31825	31633	19650
193			
191		623	459
200		1188	839
169			
170		6204	3929
190			
198			
199	9565	6736	3923
203	10632	8585	4535
196			
189		604	
208			
195	5776	3256	1856
207			
194	10234	8060	4009
205			
206	3118	1646	
209			

21Nov2014
Losing MS sensitivity
Corresponds to start of Ion grouping #3

Rec/Inj cmpds			11211REIN	
100pg/uL				Ave. r.f.
13C PCB 19	3	15:35	97846	978
13C PCB 52	4	21:48	105517	1055
13C PCB 105	5	36:39	125091	1251
13C PCB 167	6	41:52	117995	1180
13C PCB 194	8	55:23	76229	762
			15:18	
			21 Nov	

GC/MS Analysis Sequence
(19 November 2014)

Lower Willamette RM11 East Project									19 November 2014							
Client:	SEE, LLC															
MIT Project Number: 6931411																
	Spreadsheet Guide:		Polyethylene measures for stations PW001 and PW004.													
Run time	**MIT data file**					Notes:	19 Nov 2014 - Analyzing diluted PE extracts, rerunning the 5 Accustandard PCB									
							mixtures and analyzing Sediment extracts and blanks.									
07:48	1119HEX	JT Baker Ultra hexane					Confirming single point r.f's with the 20 compound PCB standard at 2 different concentrations.									
08:58	1119REIN	Recovery/Injection cmpds		100ng/mL			Analyzing 13C Recovery compounds and rare PCB congener Injection compounds for extract calculations.									
10:08	1119WW04	**PE Site 4, WW**		dilute												
11:19	1119WP04	**PE Site 4, WP**		dilute												
12:29	1119RIN2	Recovery/Injection cmpds		100ng/mL												
13:39	1119EPA	Ultra Sci. EPA Cal cmpds		50 ng/mL												
14:50	1119HEX1	JT Baker Ultra hexane														
16:00	1119WW01	**PE Site 1, WW**		dilute												
17:11	1119WP01	**PE Site 1, WP**		dilute												
18:27	1119EPA1	Ultra Sci. EPA Cal cmpds		100 ng/mL												
19:37	1119PCB1	Accustandard PCB Mix #1		200 ng/mL												
20:48	1119PCB2	Accustandard PCB Mix #2		200 ng/mL												
21:58	1119PCB3	Accustandard PCB Mix #3		200 ng/mL												
23:08	1119PCB4	Accustandard PCB Mix #4		200 ng/mL												
00:19	1119PCB5	Accustandard PCB Mix #5		200 ng/mL												
01:29	1119HEX2	JT Baker Ultra hexane														
02:39	1119ASIN	Inj. Std. ASE Sediment extr.		100 ng/mL												
03:50	1119ASYS	ASE System blank														
05:00	1119ASOL	ASE Solvent blank														
06:10	1119ASND	ASE Ottawa Sand blank														
07:21	1119SEDA	**Willamette Sediment Site 1**		1mL extr.vol.	rerun concentrated											
08:35	1119ASI1	Inj. Std. ASE Sediment extr.		100 ng/mL												
09:52	1119SED4	**Willamette Sediment Site 4**														
11:02	1119EP1A	Ultra Sci. EPA Cal cmpds		100 ng/mL												
12:21	1119SEDA	**Willamette Sediment Site 1A**		0.2mL extr.vol.												
13:23	1119SEDB	**Willamette Sediment Site 1B**		0.2mL extr.vol.												
14:34	1119EPA2	Ultra Sci. EPA Cal cmpds		50 ng/mL												
15:44	1119HEX3	JT Baker Ultra hexane														

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
2	1							1	**r.f. (area cts/pg)**			
1	1							1				
3	1			1								
4	2	12:55						196638	1966			
10	2	12:55		297876					2979			
7	2	13:57			291480				2915			
9	2	13:57		307934					3079			
6	2	14:24		302896					3029			
5	2	14:42			287673				2877			Method 8082
8	2	14:43		319393					3194	Ultra Sci. EPA calibration cmpd		
14	2	15:22		304402					3044			
19	3	15:35						145941	1459			
30	3	15:59		213980					2140			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
11	2	16:24		281847					2818			
12	2	16:43			298034				2980			
18	3	16:45			152412				1524	Ultra Sci. EPA calibration cmpd		Method 8082
13	2	16:46				226517			2265			
17	3	16:52				151211			1512			
15	2	17:07						304549	3045			
27	3	17:16		217276					2173			
24	3	17:20			215438				2154			
16	3	17:48						128689	1287			
32	3	17:50		228332					2283			
34	3	18:17		224172					2242			
23	3	18:22			217521				2175			
29	3	18:35				217541			2175			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
54	4	18:37	PRC					391352	1957			
26	3	18:58		230000					2300			
25	3	19:04					184137		1841			
50	4	19:19		311758					1559			
31	3	19:32		239240					2392			Method 8082
28	3	19:35	PRC		225456				2255	Ultra Sci. EPA calibration cmpd		
21	3	20:04					176925		1769			
20	3	20:06				197624			1976			
33	3	20:07		224874					2249			
53	4	20:04			309674				1548			
51	4	20:25			316506				1583			
22	3	20:39			219231				2192			
45	4	20:54		284211					1421			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
36	3	21:06		232305					2323			
46	4	21:24				252807			1264			
69	4	21:32					314202		1571			
73	4	21:36			392767				1964			
39	3	21:43	INJ		225227				2252			
52	4	21:48		317576					1588	Ultra Sci. EPA calibration cmpd		Method 8082
43	4	21:54						261958	1310			
49	4	22:06		332427					1662			
48	4	22:16			316474				1582			
47	4	22:18	PRC				289375		1447			
75	4	22:18		444961					2225			
38	3	22:19		231606					2316			
65	4	22:26				374940			1875			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
62	4	22:33			394743				1974			
104	5	22:51	INJ					384041	1920			
35	3	23:09		208783					2088			
44	4	23:13						268004	1340	Ultra Sci. EPA calibration cmpd		Method 8082
59	4	23:21				373009			1865			
42	4	23:28					248869		1244			
37	3	23:45						196642	1966			
72	4	23:58		432078					2160			
71	4	24:00			420717				2104			
41	4	24:08		302804					1514			
64	4	24:11					355223		1776			
68	4	24:13			430376				2152			
96	5	24:29		375072					1875			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
103	5	24:40		314023					1570			
40	4	24:42				225087			1125			
57	4	24:55		422065					2110			
100	5	25:09			302402				1512			
67	4	25:17				391634			1958			
58	4	25:26			410213				2051			
94	5	25:39			267045				1335			
63	4	25:44		428837					2144			
61	4	25:58			371601				1858			
74	4	26:04						386196	1931			
98	5	26:16						261445	1307			
102	5	26:16					249331		1247			
76	4	26:19				366684			1833			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
70	4	26:26					347143		1736			
93	5	26:26				241564			1208			
95	5	26:33		291660					1458			
121	5	26:34			365091				1825			
66	4	26:38		440835					2204	Ultra Sci. EPA calibration cmpd		Method 8082
80	4	26:40				408813			2044			
88	5	26:46		274612					1373			
91	5	27:05			286189				1431			
55	4	27:18	INJ		400267				2001			
155	6	27:37						344234	1721			
56	4	27:57						401742	2009			
60	4	28:03			413718				2069			
92	5	28:02		270441					1352			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
84	5	28:18				235466			1177			
90	5	28:27			275595				1378			
89	5	28:29		270110					1351			
101	5	28:34				287371			1437	Ultra Sci. EPA calibration cmpd		Method 8082
113	5	28:40		355658					1778			
99	5	28:57			310083				1550			
79	4	29:18		407126					2036			
119	5	29:27		394293					1971			
150	**6**	**29:29**	**INJ**		334207				1671			
112	5	29:34				344035			1720			
83	5	29:48		241397					1207			
109	5	29:48			359301				1797			
152	6	30:04		330190					1651			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
78	4	30:09		443224					2216			
97	5	30:18	PRC				232481		1162			
86	5	30:20				242087			1210			
125	5	30:24						362291	1811			
117	5	30:40			364265				1821			
116	5	30:42				333852			1669			
111	5	30:44	PRC		402374				2012			
145	6	30:42			327565				1638			
115	5	30:51					304752		1524			
87	5	30:53		294878					1474			Method 8082
148	6	30:54		248773					1244			
81	4	31:02		393092					1965			
85	5	31:14		695461					1739			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
120	5	31:14		[illegible]					1739			
136	6	31:26		339919					1700			
154	6	31:38				265177			1326			
110	5	31:41						370625	1853			Method 8082
77	4	31:58						366274	1831	Ultra Sci. EPA calibration cmpd		
82	5	32:40		259545					1298			
151	6	32:43		248261					1241			Method 8082
135	6	33:03			234226				1171			
144	6	33:11		258511					1293			
147	6	33:23				231394			1157			
124	5	33:30		377119					1886			
108	5	33:39			352377				1762			
107	5	33:45				351159			1756			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
123	5	33:53					297075		1485			
139	6	33:49			517916				1295			
149	6	33:49							1295			
140	6	34:08				237260			1186			
106	5	34:10		365611					1828			
118	5	34:14			353229				1766	Ultra Sci. EPA calibration cmpd		
143	6	34:36		239816					1199			
134	6	34:43					184902		925			
142	6	35:01		228400					1142			
131	6	35:09					189116		946			
114	5	35:11			370487				1852			
133	6	35:14		234069					1170			
165	6	35:17			308243				1541			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
122	5	35:20		374935					1875			
188	7	35:22	INJ					276542	1383			
146	6	35:38				235978			1180			
161	6	35:38		323969					1620			
184	7	36:06			289538				1448			
153	6	36:17	PRC	292561					1463	Ultra Sci. EPA calibration cmpd		Method 8082
132	6	36:18			318027				1590			
168	6	36:25			242378				1212			
105	5	36:39		354237					1771	Ultra Sci. EPA calibration cmpd		
127	5	36:50		373442					1867			
179	7	37:28		282025					1410			
141	6	37:31				222955			1115			Method 8082
137	6	38:02			247496				1237			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
176	7	38:13		288995					1445			
130	6	38:17		230855					1154			
164	6	38:41				289657			1448			
163	6	38:43					272720		1364			
138	6	38:54						251709	1259	Ultra Sci. EPA calibration cmpd		Method 8082
160	6	38:54			304370				1522			
158	6	39:02				306899			1534			
186	7	39:03			281939				1410			
178	7	39:29	PRC	207547					1038			
129	6	39:33		235385					1177			
126	5	40:00						338240	1691	Ultra Sci. EPA calibration cmpd		
175	7	40:04		213825					1069			
166	6	40:11		324085					1620			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
182	7	40:23				201293			1006			
187	7	40:23			224503				1123	Ultra Sci. EPA calibration cmpd		Method 8082
159	6	40:42		301189					1506			
183	7	40:55		229219					1146			Method 8082
162	6	41:14			309501				1548			
128	6	41:31			225292				1126	Ultra Sci. EPA calibration cmpd		
167	6	41:52		311974					1560			
185	7	42:02			211779				1059			
174	7	42:45				189664			948			
181	7	42:51			213912				1070			
177	7	43:15		194072					970			
202	8	43:31						cut off	0			
171	7	43:45		203416					1017			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
156	6	44:06		302776					1514			
173	7	44:16				165759			829			
201	8	44:21		401450					1338			
157	6	44:33			291172				1456			
204	8	44:36		382907					1276			
192	7	44:56			237954				1190			
172	7	45:02		190946					955			
197	8	45:12			389615				1299			
180	7	45:45					176727		884	Ultra Sci. EPA calibration cmpd		Method 8082
193	7	45:48				236318			1182			
191	7	46:13		245163					1226			
200	8	46:50		390089					1300			
169	6	48:03						265448	1327			

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
170	7	48:39		865696					2164	Ultra Sci. EPA calibration cmpd		Method 8082
190	7	48:39							2164			
198	8	49:05		271842					906			
199	8	49:23			278820				929			
203	8	50:01			296215				987			
196	8	50:03		283854					946			
189	7	51:49						223957	1120			
208	9	52:52						336684	1122			
195	8	53:04		271971					907	Ultra Sci. EPA calibration cmpd		
207	9	53:49		339406					1131			
194	8	55:23		274881					916			
205	8	55:46						316645	1055			
206	9	59:05						238099	794	Ultra Sci. EPA calibration cmpd		Method 8082

Comprehensive PCB mixtures Standards Quantification
(19 November 2014)

Lower Willamette RM11 East Project										19 November 2014		
Client:	SEE, LLC											
MIT Project Number:	6931411											
	Spreadsheet Gu	Polyethylene measures for stations PW001 and PW004.										
	# Cl	R.T. (**min**)										
Recovery Cmpd						Notes:	19 Nov 2014 - GCMS runs to determine individual congener response factors.					
						Accustandard PCB mixtures						
13C PCB 19	3	15:35				Method 1668 congener set of 209 chlorinated congeners by HRGC/HRMS						
13C PCB 52	4	21:48				Mix #1 P.N.	M-1668A-1-0.01-X		83 congeners			
13C PCB 105	5	36:39				Mix #2 P.N.	M-1668A-2-0.01-X		54 congeners			
13C PCB167	6	41:52				Mix #3 P.N.	M-1668A-3-0.01-X		29 congeners			
13C PCB 194	8	55:23				Mix #4 P.N.	M-1668A-4-0.01-X		15 congeners			
						Mix #5 P.N.	M-1668A-5-0.01-X		28 congeners			
Injection Cmpd												
d17-39	3	21:36				**Ultra Scientific**						
d22-104	5	22:33				EPA PCB congener calibration check solution						
d34-55	4	27:05				P.N.	RPC-EPA2		20 congeners			
d40-150	6	29:27										
d52-188	7	35:20				Method 8082 PCB Congeners Mixture						
						P.N.	RPCM-8082		19 congeners			
				200 ng/mL						Accustandard mixture concentrations		
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5			pg/µL injected	
				1119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5		**100**	**200**	**300**
Congener No.	# Cl	R.T. (**min**)		**AREA COUNTS / µL INJECTED**					Accustandard PCB mixes			
209	10	62:13						296354	988	Ultra Sci. EPA calibration cmpd		
				119PCB1	1119PCB2	1119PCB3	1119PCB4	1119PCB5				
				PCB mix #1	PCB mix #2	PCB mix #3	PCB mix #4	PCB mix #5				
		congener count		81	53	29	15	27				
				2 coelutions	1 coelution			1 missed ion				
				PCB 85,120	PCB 138,149			PCB 202				
				PCB 170,190								

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness
1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution			
	2	3	1		0			1			
	1	2	1		0.00			5			
	3	4	1		0.00			5			
1	4	2,2'	2	12:55	12.92	0.438	coelutes #10	5			
1	10	2,6	2	12:55	12.92	0.438	coelutes #4	1			
2	7	2,4	2	13:57	13.95	0.473	coelutes #9	2			
2	9	2,5	2	13:57	13.95	0.473	coelutes #7	1			
3	6	2,3'	2	14:24	14.40	0.488		1			
4	5	2,3	2	14:42	14.70	0.499	coelutes #8	2	confirmed r.t.		Method 8082
4	8	2,4'	2	14:43	14.72	0.499	coelutes #5	1	confirmed r.t.	EPA 20	
4	14	3,5	2	15:22	15.37	0.521		1			
5	19	2,2',6	3	15:35	15.58	0.529		5	confirmed r.t.	13C labelled cmpd	
5	30	2,4,6	3	15:59	15.98	0.542		1			
5	11	3,3'	2	16:24	16.40	0.556		1			
5	12	3,4	2	16:43	16.72	0.567		2			
6	18	2,2',5	3	16:45	16.75	0.568		2	confirmed r.t.	EPA 20	Method 8082
5	13	3,4'	2	16:46	16.77	0.569		3			
6	17	2,2',4	3	16:52	16.87	0.572		3			
6	15	4,4'	2	17:07	17.12	0.581		5			
7	27	2,3',6	3	17:16	17.27	0.586	coelutes #24	1			
7	24	2,3,6	3	17:20	17.33	0.588	coelutes #27	2			
8	16	2,2',3	3	17:48	17.80	0.604		5			
8	32	2,4',6	3	17:50	17.83	0.605		1			
9	34	2',3,5	3	18:17	18.28	0.620	coelutes #23	1			
8	23	2,3,5	3	18:22	18.37	0.623	coelutes #34	2			
10	29	2,4,5	3	18:35	18.58	0.630		3			
9	54	2,2',6,6'	4	18:37	18.62	0.631		5			
11	26	2,3',5	3	18:58	18.97	0.643	coelutes #25	1			
12	25	2,3',4	3	19:04	19.07	0.647	coelutes #26	4			
13	50	2,2',4,6	4	19:19	19.32	0.655		1			
13	31	2,4',5	3	19:32	19.53	0.663	coelutes #28	1	confirmed r.t.		Method 8082
13	28	2,4,4'	3	19:35	19.58	0.664	coelutes #31	2	confirmed r.t.	EPA 20	
14	21	2,3,4	3	20:04	20.07	0.681		4			
14	53	2,2',5,6'	4	20:04	20.07	0.681		2			
14	20	2,3,3'	3	20:06	20.10	0.682	coelutes #33	3			
14	33	2',3,4	3	20:07	20.12	0.682	coelutes #20	1			
15	51	2,2',4,6'	4	20:25	20.42	0.692		2			
15	22	2,3,4'	3	20:39	20.65	0.700		2			
16	45	2,2',3,6	4	20:54	20.90	0.709		1			
15	36	3,3',5	3	21:06	21.10	0.716		1			
17	46	2,2',3,6'	4	21:24	21.40	0.726		3			
18	69	2,3',4,6	4	21:32	21.53	0.730		4			
19	73	2,3',5',6	4	21:36	21.60	0.733		2			
17	39	3,4',5	3	21:43	21.72	0.737		2	confirmed r.t.	Injection cmpd	
19	52	2,2',5,5'	4	21:48	21.80	0.739	coelutes #43	1	confirmed r.t.	EPA 20	Method 8082
20	43	2,2',3,5	4	21:54	21.90	0.743	coelutes #52	5			
20	49	2,2',4,5'	4	22:06	22.10	0.750		1			
21	48	2,2',4,5	4	22:16	22.27	0.755	coelutes #75,47	2			
21	47	2,2',4,4'	4	22:18	22.30	0.756	coelutes #75,48	4			
21	75	2,4,4',6	4	22:18	22.30	0.756	coelutes #48,47	1			
20	38	3,4,5	3	22:19	22.32	0.757		1			
21	65	2,3,5,6	4	22:26	22.43	0.761		3			
21	62	2,3,4,6	4	22:33	22.55	0.765		2			
22	104	2,2',4,6,6'	5	22:51	22.85	0.775		5	confirmed r.t.	Injection cmpd	
22	35	3,3',4	3	23:09	23.15	0.785		1			
23	44	2,2',3,5'	4	23:13	23.22	0.787		5	confirmed r.t.	EPA 20	Method 8082
24	59	2,3,3',6	4	23:21	23.35	0.792		3			
24	42	2,2',3,4'	4	23:28	23.47	0.796		4			
24	37	3,4,4'	3	23:45	23.75	0.806		5			
24	72	2,3',5,5'	4	23:58	23.97	0.813	coelutes #71,41	1			
24	71	2,3',4',6	4	24:00	24.00	0.814	coelutes #72,41	2			
25	41	2,2',3,4	4	24:08	24.13	0.819	coelutes #71,72	1			
25	64	2,3,4',6	4	24:11	24.18	0.820	coelutes #68	4			
25	68	2,3',4,5'	4	24:13	24.22	0.821	coelutes #64	2			
26	96	2,2',3,6,6'	5	24:29	24.48	0.830		1			
27	103	2,2',4,5',6	5	24:40	24.67	0.837		1			
27	40	2,2',3,3'	4	24:42	24.70	0.838		3			
27	57	2,3,3',5	4	24:55	24.92	0.845		1			
28	100	2,2',4,4',6	5	25:09	25.15	0.853		2			
28	67	2,3',4,5	4	25:17	25.28	0.858		3			
28	58	2,3,3',5'	4	25:26	25.43	0.863		2			
30	94	2,2',3,5,6'	5	25:39	25.65	0.870		2			
29	63	2,3,4',5	4	25:44	25.73	0.873		1			
30	61	2,3,4,5	4	25:58	25.97	0.881		2			
30	74	2,4,4',5	4	26:04	26.07	0.884		5			
31	98	2,2',3',4,6	5	26:16	26.27	0.891		5			
31	102	2,2',4,5,6'	5	26:16	23.47	0.796		4			
31	76	2',3,4,5	4	26:19	26.32	0.893		3			
31	70	2,3',4',5	4	26:26	26.43	0.897		4			
32	93	2,2',3,5,6	5	26:26	26.43	0.897		3			
32	95	2,2',3,5',6	5	26:33	26.55	0.901	coelutes #121	1			
33	121	2,3',4,5',6	5	26:34	26.57	0.901	coelutes #95	2			
32	66	2,3',4,4'	4	26:38	26.63	0.903		1	confirmed r.t.	EPA 20	Method 8082
32	80	3,3',5,5'	4	26:40	26.67	0.904		3			
33	88	2,2',3,4,6	5	26:46	26.77	0.908		1			
34	91	2,2',3,4',6	5	27:05	27.08	0.919		2			
34	55	2,3,3',4	4	27:18	27.30	0.926		2	confirmed r.t.	Injection cmpd	
35	155	2,2',4,4',6,6'	6	27:37	27.62	0.937		5			
35	56	2,3,3',4'	4	27:57	27.95	0.948	coelutes #60	5			
36	92	2,2',3,5,5'	5	28:02	28.03	0.951		1			

Accustandard PCB mixtures
Method 1668 congener set of 209 chlorinated congeners by HRG(
Mix #1 P.N. M-1668A-1-0.01-X 83 congeners
Mix #2 P.N. M-1668A-2-0.01-X 54 congeners
Mix #3 P.N. M-1668A-3-0.01-X 29 congeners
Mix #4 P.N. M-1668A-4-0.01-X 15 congeners
Mix #5 P.N. M-1668A-5-0.01-X 28 congeners

Ultra Scientific
EPA PCB congener calibration check solution
P.N. RPC-EPA2 20 congeners

Method 8082 PCB Congeners Mixture
P.N. RPCM-8082 19 congeners

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness
1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution				**Accustandard PCB mixtures**
35	60	2,3,4,4'	4	28:03	28.05	0.951	coelutes #56	2				
37	84	2,2',3,3',6	5	28:18	28.30	0.960		3				
38	90	2,2',3,4',5	5	28:27	28.45	0.965	coelutes #90	2				
37	89	2,2',3,4,6'	5	28:29	28.48	0.966	coelutes #90	1				
38	101	2,2',4,5,5'	5	28:34	28.57	0.969		3	confirmed r.t.	EPA 20	Method 8082	
38	113	2,3,3',5',6	5	28:40	28.67	0.972		1				
39	99	2,2',4,4',5	5	28:57	28.95	0.982		2				
39	79	3,3',4,5'	4	29:18	29.30	0.994		1				
40	119	2,3',4,4',6	5	29:27	29.45	0.999		1				
40	**150**	**2,2',3,4',6,6'**	**6**	**29:29**	**29.48**	**1.000**		2	confirmed r.t.	Injection cmpd		
40	112	2,3,3',5,6	5	29:34	29.57	1.003		3				
41	83	2,2',3,3',5	5	29:48	29.80	1.011	coelutes #109	1				
41	109	2,3,3',4,6	5	29:48	29.80	1.011	coelutes #83	2				
41	152	2,2',3,5,6,6'	6	30:04	30.07	1.020		1				
41	78	3,3',4,5	4	30:09	30.15	1.023		1				
42	97	2,2',3',4,5	5	30:18	30.30	1.028	coelutes #86	4				
42	86	2,2',3,4,5	5	30:20	30.33	1.029	coelutes #97	3				
42	125	2',3,4,5,6'	5	30:24	30.40	1.031		5				
42	117	2,3,4',5,6	5	30:40	30.67	1.040	coelutes #116,111	2				
42	145	2,2',3,4,6,6'	6	30:42	30.70	1.041		2				
42	116	2,3,4,5,6	5	30:42	30.70	1.041	coelutes #117,111	3				
43	111	2,3,3',5,5'	5	30:44	30.73	1.042	coelutes #116,117	2				
43	115	2,3,4,4',6	5	30:51	30.85	1.046	coelutes #87	4				
43	87	2,2',3,4,5'	5	30:53	30.88	1.047	coelutes #115	1	confirmed r.t.		Method 8082	
44	148	2,2',3,4',5,6'	6	30:54	30.90	1.048		1				
42	81	3,4,4',5	4	31:02	31.03	1.053		1				
44	85	2,2',3,4,4'	5	31:14	31.23	1.059		1				
45	120	2,3',4,5,5'	5	31:14	31.23	1.059		1				
45	136	2,2',3,3',6,6'	6	31:26	31.43	1.066		1				
47	154	2,2',4,4',5,6'	6	31:38	31.63	1.073		3				
46	110	2,3,3',4',6	5	31:41	31.68	1.075		5	confirmed r.t.		Method 8082	
46	77	3,3',4,4'	4	31:58	31.97	1.084		5	confirmed r.t.	EPA 20		
47	82	2,2',3,3',4	5	32:40	32.67	1.108		1				
47	151	2,2',3,5,5',6	6	32:43	32.72	1.110		1	confirmed r.t.		Method 8082	
48	135	2,2',3,3',5,6'	6	33:03	33.05	1.121		2				
48	144	2,2',3,4,5',6	6	33:11	33.18	1.125		1				
48	147	2,2',3,4',5,6	6	33:23	33.38	1.132		3				
48	124	2',3,4,5,5'	5	33:30	33.50	1.136		1				
49	108	2,3,3',4,5'	5	33:39	33.65	1.141		2				
49	107	2,3,3',4',5	5	33:45	33.75	1.145		3				
50	139	2,2',3,4,4',6	6	33:49	33.82	1.147	coelutes #149	2				
50	149	2,2',3,4',5',6	6	33:49	33.82	1.147	coelutes #139	2				
50	123	2',3,4,4',5	5	33:53	33.88	1.149		4				
50	140	2,2',3,4,4',6'	6	34:08	34.13	1.158		3				
50	106	2,3,3',4,5	5	34:10	34.17	1.159		1				
50	118	2,3',4,4',5	5	34:14	34.23	1.161		2				
51	143	2,2',3,4,5,6'	6	34:36	34.60	1.174		1	confirmed r.t.	EPA 20		
51	134	2,2',3,3',5,6	6	34:43	34.72	1.178		4				
52	142	2,2',3,4,5,6	6	35:01	35.02	1.188		1				
52	131	2,2',3,3',4,6	6	35:09	35.15	1.192		4				
52	114	2,3,4,4',5	5	35:11	35.18	1.193		2				
52	133	2,2',3,3',5,5'	6	35:14	35.23	1.195		1				
52	165	2,3,3',5,5',6	6	35:17	35.28	1.197		2				
52	122	2',3,3',4,5	5	35:20	35.33	1.198		1				
52	188	2,2',3,4',5,6,6'	7	35:22	35.37	1.200		5	confirmed r.t.	Injection cmpd		
53	146	2,2',3,4',5,5'	6	35:38	35.63	1.209	coelutes #161	3				
53	161	2,3,3',4,5',6	6	35:38	35.63	1.209	coelutes #146	1				
53	184	2,2',3,4,4',6,6'	7	36:06	36.10	1.224		2				
54	153	2,2',4,4',5,5'	6	36:17	36.28	1.231	coelutes #132	1	confirmed r.t.	EPA 20	Method 8082	
54	132	2,2',3,3',4,6'	6	36:18	36.30	1.231	coelutes #153	2				
54	168	2,3',4,4',5',6	6	36:25	36.42	1.235		2				
54	105	2,3,3',4,4'	5	36:39	36.65	1.243		1	confirmed r.t.	EPA 20		
54	127	3,3',4,5,5'	5	36:50	36.83	1.249		1				
55	179	2,2',3,3',5,6,6'	7	37:28	37.47	1.271		1				
55	141	2,2',3,4,5,5'	6	37:31	37.52	1.272		3	confirmed r.t.		Method 8082	
57	137	2,2',3,4,4',5	6	38:02	38.03	1.290		2				
57	176	2,2',3,3',4,6,6'	7	38:13	38.22	1.296		1				
56	130	2,2',3,3',4,5'	6	38:17	38.28	1.298		1				
58	164	2,3,3',4',5',6	6	38:41	38.68	1.312	coelutes #163	3				
58	163	2,3,3',4',5,6	6	38:43	38.72	1.313	coelutes #164	4				
58	138	2,2',3,4,4',5'	6	38:54	38.90	1.319		5	confirmed r.t.	EPA 20	Method 8082	
58	160	2,3,3',4,5,6	6	38:54	38.90	1.319		2				
58	158	2,3,3',4,4',6	6	39:02	39.03	1.324		3				
58	186	2,2',3,4,5,6,6'	7	39:03	39.05	1.324		2				
59	178	2,2',3,3',5,5',6	7	39:29	39.48	1.339		1				
59	129	2,2',3,3',4,5	6	39:33	39.55	1.341		1				
59	126	3,3',4,4',5	5	40:00	40.00	1.357		5	confirmed r.t.	EPA 20		
60	175	2,2',3,3',4,5',6	7	40:04	40.07	1.359		1				
59	166	2,3,4,4',5,6	6	40:11	40.18	1.363		1				
61	182	2,2',3,4,4',5,6'	7	40:23	40.38	1.370	coelutes #187	3				
61	187	2,2',3,4',5,5',6	7	40:23	40.38	1.370	coelutes #182	2	confirmed r.t.	EPA 20	Method 8082	
61	159	2,3,3',4,5,5'	6	40:42	40.70	1.380		1				
62	183	2,2',3,4,4',5',6	7	40:55	40.92	1.388		1	confirmed r.t.		Method 8082	
62	162	2,3,3',4',5,5'	6	41:14	41.23	1.399		2				
63	128	2,2',3,3',4,4'	6	41:31	41.52	1.408		2	confirmed r.t.	EPA 20		
64	167	2,3',4,4',5,5'	6	41:52	41.87	1.420		1	confirmed r.t.	13C labelled cmpd		
65	185	2,2',3,4,5,5',6	7	42:02	42.03	1.426		2				
66	174	2,2',3,3',4,5,6'	7	42:45	42.75	1.450		3				
66	181	2,2',3,4,4',5,6	7	42:51	42.85	1.453		2				
67	177	2,2',3,3',4',5,6	7	43:15	43.25	1.467		1				

Compound Standard by Elution Time
(November 16, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.
Willamette River Project

16 November 2014

Recovery Cmpd	# Cl	R.T. (**min**)
13C PCB 19	3	15:35
13C PCB 52	4	21:48
13C PCB 105	5	36:39
13C PCB167	6	41:52
13C PCB 194	8	55:23
Injection Cmpd		
d17-39	3	3,4',5
d22-104	5	2,2',4,6,6'
d34-55	4	2,3,3',4
d40-150	6	2,2',3,4',6,6'
d52-188	7	2,2',3,4',5,6,6'

2Cl - 10Cl Congener PCB List

J&W Scientific DB-5MS, 60m length, 0.25µm film thickness

1mL/min column flow rate
Pulse pressure, splitless injection (1min)

Domain	Congener No.	Structure	# Cl	R.T. (**min**)	R.T. (**min**)	r.r.t. (min)	Notes	Solution				**Accustandard PCB mixtures**
68	202	2,2',3,3',5,5',6,6'	8	43:31	43.52	1.476		5				
68	171	2,2',3,3',4,4',6	7	43:45	43.75	1.484		1				
68	156	2,3,3',4,4',5	6	44:06	44.10	1.496		1				
69	173	2,2',3,3',4,5,6	7	44:16	44.27	1.501		3				
69	201	2,2',3,3',4,5',6,6'	8	44:21	44.35	1.504		1				
69	157	2,3,3',4,4',5'	6	44:33	44.55	1.511		2				
69	204	2,2',3,4,4',5,6,6'	8	44:36	44.60	1.513		1				
70	192	2,3,3',4,5,5',6	7	44:56	44.93	1.524		2				
70	172	2,2',3,3',4,5,5'	7	45:02	45.03	1.527		1				
71	197	2,2',3,3',4,4',6,6'	8	45:12	45.20	1.533		2				
72	180	2,2',3,4,4',5,5'	7	45:45	45.75	1.552	coelutes #193	4	confirmed r.t.	EPA 20	Method 8082	
73	193	2,3,3',4',5,5',6	7	45:48	45.80	1.553	coelutes #180	3				
74	191	2,3,3',4,4',5',6	7	46:13	46.22	1.568		1				
75	200	2,2',3,3',4,5,6,6'	8	46:50	46.83	1.588		1				
76	169	3,3',4,4',5,5'	6	48:03	48.05	1.630		5				
77	170	2,2',3,3',4,4',5	7	48:39	48.65	1.650	coelutes #190	1	confirmed r.t.	EPA 20	Method 8082	
77	190	2,3,3',4,4',5,6	7	48:39	48.65	1.650	coelutes #170	1				
78	198	2,2',3,3',4,5,5',6	8	49:05	49.08	1.665		1				
79	199	2,2',3,3',4,5,5',6'	8	49:23	49.38	1.675		2				
80	203	2,2',3,4,4',5,5',6	8	50:01	50.02	1.696	coelutes #196	2				
80	196	2,2',3,3',4,4',5,6'	8	50:03	50.05	1.698	coelutes #203	1				
81	189	2,3,3',4,4',5,5'	7	51:49	51.82	1.757		5				
82	208	2,2',3,3',4,5,5',6,6'	9	52:52	52.87	1.793		5				
82	195	2,2',3,3',4,4',5,6	8	53:04	53.07	1.800		1	confirmed r.t.	EPA 20		
83	207	2,2',3,3',4,4',5,6,6'	9	53:49	53.82	1.825		1				
84	194	2,2',3,3',4,4',5,5'	8	55:23	55.38	1.878		1	confirmed r.t.	13C labelled cmpd		
85	205	2,3,3',4,4',5,5',6	8	55:46	55.77	1.891		5				
86	206	2,2',3,3',4,4',5,5',6	9	59:05	59.08	2.004		5	confirmed r.t.	EPA 20	Method 8082	
87	209	2,2',3,3',4,4',5,5',6,6'	10	62:13	62.22	2.110		5	confirmed r.t.	EPA 20		

Compound Standard by Solution
(November 15, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

15 November 2014

Accustandard PCB congener Identification mixtures

SOLUTION #1

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
	2	3	1		0		1
1	10	2,6	2	12:55	12.92	coelutes #4	1
2	9	2,5	2	13:57	13.95	coelutes #7	1
3	6	2,3'	2	14:24	14.40		1
4	8	2,4'	2	14:43	14.72	coelutes #5	1
4	14	3,5	2	15:22	15.37		1
5	11	3,3'	2	16:24	16.40		1
5	30	2,4,6	3	15:59	15.98		1
7	27	2,3',6	3	17:16	17.27	coelutes #24	1
8	32	2,4',6	3	17:50	17.83		1
9	34	2',3,5	3	18:17	18.28	coelutes #23	1
11	26	2,3',5	3	18:58	18.97	coelutes #25	1
13	31	2,4',5	3	19:32	19.53	coelutes #28	1
13	50	2,2',4,6	4	19:19	19.32		1
14	33	2',3,4	3	20:07	20.12	coelutes #20	1
15	36	3,3',5	3	21:06	21.10		1
16	45	2,2',3,6	4	20:54	20.90		1
19	52	2,2',5,5'	4	21:48	21.80	coelutes #43	1
20	38	3,4,5	3	22:19	22.32		1
20	49	2,2',4,5'	4	22:06	22.10		1
21	75	2,4,4',6	4	22:18	22.30	coelutes #48,47	1
22	35	3,3',4	3	23:09	23.15		1
24	72	2,3',5,5'	4	23:58	23.97	coelutes #71,41	
25	41	2,2',3,4	4	24:08	24.13	coelutes #71,72	1
26	96	2,2',3,6,6'	5	24:29	24.48		1
27	103	2,2',4,5',6	5	24:40	24.67		
27	57	2,3,3',5	4	24:55	24.92		
29	63	2,3,4',5	4	25:44	25.73		1
32	66	2,3',4,4'	4	26:38	26.63		1
32	95	2,2',3,5',6	5	26:33	26.55	coelutes #121	1
33	88	2,2',3,4,6	5	26:46	26.77		1
36	92	2,2',3,5,5'	5	28:02	28.03		1
37	89	2,2',3,4,6'	5	28:29	28.48	coelutes #90	
38	113	2,3,3',5',6	5	28:40	28.67		
39	79	3,3',4,5'	4	29:18	29.30		
40	119	2,3',4,4',6	5	29:27	29.45		1
41	152	2,2',3,5,6,6'	6	30:04	30.07		
41	78	3,3',4,5	4	30:09	30.15		
41	83	2,2',3,3',5	5	29:48	29.80	coelutes #109	1
72	81	3,4,4',5	4	31:02	31.03		
43	87	2,2',3,4,5'	5	30:53	30.88		1
44	85	2,2',3,4,4'	5	31:14	31.23		1
44	148	2,2',3,4',5,6'	6	30:54	30.90		
45	136	2,2',3,3',6,6'	6	31:26	31.43		1
45	120	2,3',4,5,5'	5	31:14	31.23		
47	82	2,2',3,3',4	5	32:40	32.67		1
47	151	2,2',3,5,5',6	6	32:43	32.72		1
48	144	2,2',3,4,5',6	6	33:11	33.18		
48	124	2',3,4,5,5'	5	33:30	33.50		
50	106	2,3,3',4,5	5	34:10	34.17		
51	143	2,2',3,4,5,6'	6	34:36	34.60		1
52	122	2',3,3',4,5	5	35:20	35.33		1
52	142	2,2',3,4,5,6	6	35:01	35.02		
52	133	2,2',3,3',5,5'	6	35:14	35.23		

SOLUTION #2

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
2	7	2,4	2	13:57	13.95	coelutes #9	2
4	5	2,3	2	14:42	14.70	coelutes #8	2
5	12	3,4	2	16:43	16.72		
6	18	2,2',5	3	16:45	16.75		2
7	24	2,3,6	3	17:20	17.33	coelutes #27	2
8	23	2,3,5	3	18:22	18.37	coelutes #34	
13	28	2,4,4'	3	19:35	19.58	coelutes #31	2
14	53	2,2',5,6'	4	20:04	20.07		2
15	51	2,2',4,6'	4	20:25	20.42		2
15	22	2,3,4'	3	20:39	20.65		2
17	39	3,4',5	3	21:43	21.72		2
19	73	2,3',5',6	4	21:36	21.60		
21	48	2,2',4,5	4	22:16	22.27	coelutes #75,47	2
21	62	2,3,4,6	4	22:33	22.55		
24	71	2,3',4',6	4	24:00	24.00	coelutes #72,41	
25	68	2,3',4,5'	4	24:13	24.22	coelutes #64	
28	58	2,3,3',5'	4	25:26	25.43		
28	100	2,2',4,4',6	5	25:09	25.15		2
30	61	2,3,4,5	4	25:58	25.97		
30	94	2,2',3,5,6'	5	25:39	25.65		
33	121	2,3',4,5',6	5	26:34	26.57	coelutes #95	
34	91	2,2',3,4',6	5	27:05	27.08		2
34	55	2,3,3',4	4	27:18	27.30		2
35	60	2,3,4,4'	4	28:03	28.05	coelutes #56	2
38	90	2,2',3,4',5	5	28:27	28.45	coelutes #90	2
39	99	2,2',4,4',5	5	28:57	28.95		2
40	150	2,2',3,4',6,6'	6	29:29	29.48		2
41	109	2,3,3',4,6	5	29:48	29.80	coelutes #83	
42	117	2,3,4',5,6	5	30:40	30.67	coelutes #116,111	
42	145	2,2',3,4,6,6'	6	30:42	30.70		
43	111	2,3,3',5,5'	5	30:44	30.73	coelutes #116,117	
48	135	2,2',3,3',5,6'	6	33:03	33.05		2
49	108	2,3,3',4,5'	5	33:39	33.65		
50	149	2,2',3,4',5',6	6	33:49	33.82	coelutes #139	
50	139	2,2',3,4,4',6	6	33:49	33.82	coelutes #149	
50	118	2,3',4,4',5	5	34:14	34.23		2
52	114	2,3,4,4',5	5	35:11	35.18		
52	165	2,3,3',5,5',6	6	35:17	35.28		
53	184	2,2',3,4,4',6,6'	7	36:06	36.10		
54	132	2,2',3,3',4,6'	6	36:18	36.30	coelutes #153	
54	168	2,3',4,4',5',6	6	36:25	36.42		2
57	137	2,2',3,4,4',5	6	38:02	38.03		2
58	160	2,3,3',4,5,6	6	38:54	38.90		2
58	186	2,2',3,4,5,6,6'	7	39:03	39.05		
61	187	2,2',3,4',5,5',6	7	40:23	40.38	coelutes #182	2
62	162	2,3,3',4',5,5'	6	41:14	41.23		
63	128	2,2',3,3',4,4'	6	41:31	41.52		2
65	185	2,2',3,4,5,5',6	7	42:02	42.03		2
66	181	2,2',3,4,4',5,6	7	42:51	42.85		
69	157	2,3,3',4,4',5'	6	44:33	44.55		2
70	192	2,3,3',4,5,5',6	7	44:56	44.93		
71	197	2,2',3,3',4,4',6,6'	8	45:12	45.20		2
79	199	2,2',3,3',4,5,5',6'	8	49:23	49.38		2
80	203	2,2',3,4,4',5,5',6	8	50:01	50.02	coelutes #196	2

Compound Standard by Solution
(November 15, 2014)

Lower Willamette RM11 East Project
Client: SEE, LLC
MIT Project Number: 6931411
Spreadsheet Guide: Polyethylene measures for stations PW001 and PW004.

15 November 2014

Accustandard PCB congener Identification mixtures

SOLUTION #3

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
5	13	3,4'	2	16:46	16.77		
6	17	2,2',4	3	16:52	16.87		3
10	29	2,4,5	3	18:35	18.58		3
14	20	2,3,3'	3	20:06	20.10	coelutes #33	3
17	46	2,2',3,6'	4	21:24	21.40		3
21	65	2,3,5,6	4	22:26	22.43		
24	59	2,3,3',6	4	23:21	23.35		3
27	40	2,2',3,3'	4	24:42	24.70		3
28	67	2,3',4,5	4	25:17	25.28		3
31	76	2',3,4,5	4	26:19	26.32		
32	93	2,2',3,5,6	5	26:26	26.43		
32	80	3,3',5,5'	4	26:40	26.67		
37	84	2,2',3,3',6	5	28:18	28.30		3
38	101	2,2',4,5,5'	5	28:34	28.57		3
40	112	2,3,3',5,6	5	29:34	29.57		
42	86	2,2',3,4,5	5	30:20	30.33	coelutes #97	
42	116	2,3,4,5,6	5	30:42	30.70	coelutes #117,111	
47	154	2,2',4,4',5,6'	6	31:38	31.63		
48	147	2,2',3,4',5,6	6	33:23	33.38		
49	107	2,3,3',4',5	5	33:45	33.75		3
50	140	2,2',3,4,4',6'	6	34:08	34.13		
53	146	2,2',3,4',5,5'	6	35:38	35.63	coelutes #161	3
55	141	2,2',3,4,5,5'	6	37:31	37.52		3
58	164	2,3,3',4',5',6	6	38:41	38.68	coelutes #163	
58	158	2,3,3',4,4',6	6	39:02	39.03		3
61	182	2,2',3,4,4',5,6'	7	40:23	40.38	coelutes #187	
66	174	2,2',3,3',4,5,6'	7	42:45	42.75		3
69	173	2,2',3,3',4,5,6	7	44:16	44.27		3
73	193	2,3,3',4',5,5',6	7	45:48	45.80	coelutes #180	3

SOLUTION #4

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
12	25	2,3',4	3	19:04	19.07	coelutes #26	4
14	21	2,3,4	3	20:04	20.07		
18	69	2,3',4,6	4	21:32	21.53		4
21	47	2,2',4,4'	4	22:18	22.30	coelutes #75,48	4
24	42	2,2',3,4'	4	23:28	23.47		4
25	64	2,3,4',6	4	24:11	24.18	coelutes #68	4
31	102	2,2',4,5,6'	5	26:16	26.27		4
31	70	2,3',4',5	4	26:26	26.43		
42	97	2,2',3',4,5	5	30:18	30.30	coelutes #86	4
43	115	2,3,4,4',6	5	30:51	30.85	coelutes #87	4
50	123	2',3,4,4',5	5	33:53	33.88		4
51	134	2,2',3,3',5,6	6	34:43	34.72		4
52	131	2,2',3,3',4,6	6	35:09	35.15		4
58	163	2,3,3',4',5,6	6	38:43	38.72	coelutes #164	
72	180	2,2',3,4,4',5,5'	7	45:45	45.75	coelutes #193	4

SOLUTION #5

Domain	Congener No.	Structure	# Cl		R.T. (**min**)	Notes	Solution
	1	2	1				
	3	4	1				
1	4	2,2'	2	12:55	12.92	coelutes #10	5
5	19	2,2',6	3	15:35	15.58		5
6	15	4,4'	2	17:07	17.12		5
8	16	2,2',3	3	17:48	17.80		5
9	54	2,2',6,6'	4	18:37	18.62		
20	43	2,2',3,5	4	21:54	21.90	coelutes #52	
22	104	2,2',4,6,6'	5	22:51	22.85		5
23	44	2,2',3,5'	4	23:13	23.22		5
24	37	3,4,4'	3	23:45	23.75		5
30	74	2,4,4',5	4	26:04	26.07		5
31	98	2,2',3',4,6	5	26:16	26.27		
35	56	2,3,3',4'	4	27:57	27.95	coelutes #60	5
35	155	2,2',4,4',6,6'	6	27:37	27.62		
42	125	2',3,4,5,6'	5	30:24	30.40		
46	110	2,3,3',4',6	5	31:41	31.68		5
46	77	3,3',4,4'	4	31:58	31.97		5
52	188	2,2',3,4',5,6,6'	7	35:22	35.37		5
58	138	2,2',3,4,4',5'	6	38:54	38.90		5
59	126	3,3',4,4',5	5	40:00	40.00		5
68	202	2,2',3,3',5,5',6,6'	8	43:31	43.52		5
76	169	3,3',4,4',5,5'	6	48:03	48.05		5
81	189	2,3,3',4,4',5,5'	7	51:49	51.82		5
82	208	2,2',3,3',4,5,5',6,6'	9	52:52	52.87		5
85	205	2,3,3',4,4',5,5',6	8	55:46	55.77		5
86	206	2,2',3,3',4,4',5,5',6	9	59:05	59.08		5
87	209	2,2',3,3',4,4',5,5',6,6'	10	62:13	62.22		5

MIT: Organic Carbon and Black Carbon Measures 20 March 2015

Client:

MIT Project Number: 6931411

Willamette Sediment Samples

Sites 01 and 04

These samples have very low carbon content (<1%) consistent with sandy sediments.
The ratios of TOC : BC are consistent with areas we have analyzed previously.

OC = Total Organic carbon
BC = CTO 375 °C treated

		% N	% C	% H
PW001 OC Site 1	Average =	0.0341	0.3961	0.3332
	Std Dev =	0.0298	0.1789	0.0484
	% error =	87.5	45.2	14.5
PW001 **BC** Site 1	Average =	0.0055	**0.0320**	0.1637
	Std Dev =	0.0028	0.0061	0.0140
	% error =	49.9	19.2	8.6

Note: **Site 1 Sediment TOC is ~ 0.4% with a significant degree of variability due to the very low areas associated with 10-20mg samples.**

Site 1 Sediment BC is ~ 0.03%

		% N	% C	% H
PW004 OC Site 4	Average =	0.0346	0.6411	0.3642
	Std Dev =	0.0113	0.2518	0.0560
	% error =	32.6	39.3	15.4
PW004 **BC** Site 4	Average =	0.0069	**0.0306**	0.1803
	Std Dev =	0.0018	0.0052	0.0338
	% error =	26.4	17.0	18.8

Note: **Site 4 Sediment TOC is ~ 0.6% with a relatively high degree of variability due to the very low areas associated with 10-20mg samples.**

Site 4 Sediment BC is ~ 0.03%

[Data]
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Name	Date	Time	Weight	Calculated CHN %			N Factor	C Factor	H Factor	Abs N	Abs C	Abs H	Area N	Area C	Area	Comp Err	C/N	Oxygen Setting
				% N	**% C**	% H												
Blank O2=3 (150sec)	20.03.15	9:11	100	0.0011	0.0009	0.0048	1	1	1	0.001133	0.000926	0.004806	28	17	270	NuCuHu	0.818	3
Acetanilide	20.03.15	10:09	8.14	10.36	71.09	6.71	0.9225	0.9246	0.9088	0.914117	6.258881	0.600988	31724	150807	52068		6.862	1
Acetanilide	20.03.15	10:25	8.13	10.36	71.09	6.71	0.9455	0.9536	0.9014	0.890824	6.060579	0.605203	30915	146093	52438		6.862	1
Acetanilide	20.03.15	10:40	7.15	10.36	71.09	6.71	0.9605	0.9670	0.9039	0.7712	5.256631	0.530744	26746	126948	45903		6.862	1
Blank O2=3 (150sec)	20.03.15	10:48	100	0.0019	0.2161	0.0057	0.9428	0.9484	0.9047	0.002023	0.227814	0.006301	50	5171	354	NuHu	113.294	3
Blank O2=3 (150sec)	20.03.15	10:56	100	0.0000	0.0608	0.0035	0.9428	0.9484	0.9047	0	0.064125	0.003827	0	1177	215	CuHu	0.000	3
Blank O2=3 (150sec)	20.03.15	11:04	100	0.0000	0.0325	0.0022	0.9428	0.9484	0.9047	0	0.034269	0.002421	0	629	136	CuHu	0.000	3
Blank O2=3 (150sec)	20.03.15	11:12	100	0.0000	0.0231	0.0014	0.9428	0.9484	0.9047	0	0.024408	0.001513	0	448	85	CuHu	0.000	3
Blank O2=1 (90sec)	20.03.15	11:20	100	0.0000	0.0181	0.0010	0.9428	0.9484	0.9047	0.00004	0.019069	0.001104	1	350	62	NuCuHu	474.148	1
Blank O2=1 (90sec)	20.03.15	11:31	100	0.0009	0.0234	0.0011	0.9428	0.9484	0.9047	0.00093	0.024626	0.001193	23	452	67	NuCuHu	26.623	1
Acetanilide Unknown	20.03.15	11:43	7.92	*10.61*	*73.56*	*6.35*	0.9428	0.9484	0.9047	0.891284	6.142971	0.555758	30931	148052	48098		6.933	1
Blank O2=1 (90sec)	20.03.15	11:50	100	0	0	0.008132	0.9428	0.9484	0.9047	0	0	0.008988	0	0	505	Hu	0.000	1
Blank O2=1 (90sec)	20.03.15	11:58	100	0.0000	0.0002	0.0031	0.9428	0.9484	0.9047	0.00004	0.000218	0.003382	1	4	190	NuCuHu	5.419	1
Blank O2=1 (90sec)	20.03.15	12:06	100	0.0003	0.0003	0.0017	0.9428	0.9484	0.9047	0.000364	0.000327	0.001887	9	6	106	NuCuHu	0.903	1
Blank O2=1 (90sec)	20.03.15	12:14	100	0.0002	0.0002	0.0011	0.9428	0.9484	0.9047	0.000202	0.000163	0.001193	5	3	67	NuCuHu	0.813	1
Blank O2=1 (90sec)	20.03.15	12:22	100	0.0003	0.0001	0.0008	0.9428	0.9484	0.9047	0.000324	0.000054	0.000837	8	1	47	NuCuHu	0.169	1
Blank O2=1 (90sec)	20.03.15	12:31	100	0.0002	0.0001	0.0005	0.9428	0.9484	0.9047	0.000243	0.000054	0.000605	6	1	34	NuCuHu	0.226	1
PW001 **BC**	20.03.15	12:39	10.78	0.0103	**0.0422**	0.1592	0.9428	0.9484	0.9047	0.001173	0.004794	0.018963	29	88	1079	NuCu	4.111	1
PW001 **BC**	20.03.15	12:47	11.95	0.0051	**0.0290**	0.1707	0.9428	0.9484	0.9047	0.000647	0.00365	0.022544	16	67	1392	NuCu	5.673	1
PW001 **BC**	20.03.15	12:55	20.12	0.0046	**0.0313**	0.1431	0.9428	0.9484	0.9047	0.000971	0.006647	0.031834	24	122	2204	NuCu	6.886	1
PW001 **BC**	20.03.15	13:03	10.16	0.0030	**0.0259**	0.1809	0.9428	0.9484	0.9047	0.000324	0.002779	0.020313	8	51	1197	NuCu	8.636	1
PW001 **BC**	20.03.15	13:11	13.67	0.0047	**0.0314**	0.1646	0.9428	0.9484	0.9047	0.000688	0.004522	0.024867	17	83	1595	NuCu	6.614	1
Tin Capsule Blk	20.03.15	13:19	30.77	0.0000	0.0000	0.0088	0.9428	0.9484	0.9047	0	0	0.00299	0	0	168	Hu	0.000	1
PW001 OC	20.03.15	13:27	12.77	0.0355	0.2954	0.3385	0.9428	0.9484	0.9047	0.004814	0.039772	0.047781	119	730	3598	NuCu	8.310	1
PW001 OC	20.03.15	13:36	19.35	0.0179	0.2283	0.2813	0.9428	0.9484	0.9047	0.003681	0.046582	0.060157	91	855	4680	NuCu	12.728	1
PW001 OC	20.03.15	13:44	18.09	0.0854	0.6910	0.3926	0.9428	0.9484	0.9047	0.016384	0.131802	0.078501	433	2792	6284		8.092	1
PW001 OC	20.03.15	13:52	22.33	0.0164	0.3481	0.2879	0.9428	0.9484	0.9047	0.003883	0.081966	0.071068	96	1556	5634	Nu	21.231	1
PW001 OC	20.03.15	14:00	11.51	0.0152	0.4179	0.3656	0.9428	0.9484	0.9047	0.001861	0.050722	0.046511	46	931	3487	NuCu	27.418	1
Blank O2=1 (90sec)	20.03.15	14:08	100	0.0000	0.0000	0.0036	0.9428	0.9484	0.9047	0	0	0.003969	0	0	223	Hu	0.000	1
Acetanilide Unknown	20.03.15	14:21	4.51	*10.76*	*73.53*	*6.47*	0.9428	0.9484	0.9047	0.514548	3.496773	0.322466	17749	84809	27640		6.836	1
Blank O2=3 (150sec)	20.03.15	14:28	100	0.0000	0.0000	0.0053	0.9428	0.9484	0.9047	0	0	0.005909	0	0	332	Hu	0.000	3
Blank O2=3 (150sec)	20.03.15	14:36	100	0.0000	0.0000	0.0018	0.9428	0.9484	0.9047	0	0	0.002029	0	0	114	Hu	0.000	3
Blank O2=3 (150sec)	20.03.15	14:44	100	0.0000	0.0002	0.0010	0.9428	0.9484	0.9047	0.00004	0.000163	0.00105	1	3	59	NuCuHu	4.064	3
Blank O2=3 (150sec)	20.03.15	14:52	100	0.0000	0.0001	0.0005	0.9428	0.9484	0.9047	0	0.000054	0.000605	0	1	34	CuHu	0.000	3
Blank O2=3 (150sec)	20.03.15	15:00	100	0.0001	0.0001	0.0004	0.9428	0.9484	0.9047	0.000081	0.000109	0.000409	2	2	23	NuCuHu	1.355	3
Blank O2=1 (90sec)	20.03.15	15:08	100	0.0001	0.0001	0.0003	0.9428	0.9484	0.9047	0.000121	0.000054	0.000285	3	1	16	NuCuHu	0.452	1
PW004 **BC**	20.03.15	15:17	13.63	0.0098	**0.0227**	0.1390	0.9428	0.9484	0.9047	0.001416	0.003269	0.020943	35	60	1252	NuCu	2.322	1
PW004 **BC**	20.03.15	15:25	11.82	0.0061	**0.0354**	0.1768	0.9428	0.9484	0.9047	0.000769	0.004413	0.023105	19	81	1441	NuCu	5.775	1
PW004 **BC**	20.03.15	15:33	11.11	0.0072	**0.0335**	0.2129	0.9428	0.9484	0.9047	0.00085	0.003923	0.026148	21	72	1707	NuCu	4.645	1
PW004 **BC**	20.03.15	15:41	8.47	0.0063	**0.0336**	0.2158	0.9428	0.9484	0.9047	0.000566	0.002996	0.020199	14	55	1187	NuCu	5.322	1
PW004 **BC**	20.03.15	15:49	13.86	0.0050	**0.0280**	0.1571	0.9428	0.9484	0.9047	0.000728	0.004086	0.024066	18	75	1525	NuCu	5.645	1
Blank O2=1 (90sec)	20.03.15	15:57	100	0.0000	0.0004	0.0028	0.9428	0.9484	0.9047	0	0.000381	0.003061	0	7	172	CuHu	0.000	1
Tin Capsule Blk	20.03.15	16:05	30.41	0.0006	0.0063	0.0027	0.9428	0.9484	0.9047	0.000202	0.002016	0.000908	5	37	51	NuCuHu	10.025	1
PW004 OC	20.03.15	16:13	8.95	0.0516	0.5617	0.3849	0.9428	0.9484	0.9047	0.004895	0.053011	0.038081	121	973	2750	NuCu	10.894	1
PW004 OC	20.03.15	16:21	8.98	0.0251	0.6335	0.3206	0.9428	0.9484	0.9047	0.002387	0.059984	0.031823	59	1101	2203	NuCu	25.280	1
PW004 OC	20.03.15	16:30	14.62	0.0271	0.3941	0.3118	0.9428	0.9484	0.9047	0.004207	0.060747	0.050389	104	1115	3826	NuCu	14.524	1
PW004 OC	20.03.15	16:38	11.35	0.0407	1.0636	0.4500	0.9428	0.9484	0.9047	0.004895	0.127285	0.056451	121	2680	4356	Nu	26.157	1
PW004 OC	20.03.15	16:46	14.32	0.0285	0.5527	0.3535	0.9428	0.9484	0.9047	0.004328	0.083458	0.05596	107	1593	4313	Nu	19.395	1
Blank O2=1 (90sec)	20.03.15	16:54	100	0.0000	0.0002	0.0036	0.9428	0.9484	0.9047	0	0.000218	0.003951	0	4	222	CuHu	0.000	1
Acetanilide Unknown	20.03.15	17:09	10.21	*10.62*	*72.62*	*6.60*	0.9428	0.9484	0.9047	1.149712	7.818086	0.74463	39844	187772	64683		6.840	1
Blank O2=1 (90sec)	20.03.15	17:16	100	0.0000	0.0537	0.0047	0.9428	0.9484	0.9047	0	0.056606	0.005215	0	1039	293	CuHu	0.000	1
Name	Date	Time	Weight	% N	% C	% H	N Factor	C Factor	H Factor	Abs N	Abs C	Abs H	Area N	Area C	Area	Comp Err	C/N	Oxygen Setting

Appendix J

Analytical Results and Data Reduction of Field Splits

Table J-1
Analytical Results and Data Reduction of Bulk Sediment Field Duplicates

Analyte	Sample ID	RM11E-PW004-SED		
	Unit	Parent	Duplicate	Average
Conventionals				
Total solids	percent	70.8	78	74.4 T
Total organic carbon	percent	1.26	1.06	1.16 T
Black carbon	percent	0.16 U	0.17 U	0.16 UT
Grain Size				
Clay	percent	1.6	1.49	1.55 T
Silt	percent	3.85	4.17	4.01 T
Very fine sand	percent	9.03	8.43	8.73 T
Fine sand	percent	30.68	31.41	31.05 T
Medium sand	percent	26.55	27.89	27.22 T
Coarse sand	percent	7.85	7.65	7.75 T
Very coarse sand	percent	3.04	3.54	3.29 T
Gravel	percent	22.27	14.34	18.31 T
Aroclors				
Aroclor 1016	µg/kg	49 U	38 U	38 UT
Aroclor 1221	µg/kg	21 U	15 U	15 UT
Aroclor 1232	µg/kg	480 U	55 U	55 UT
Aroclor 1242	µg/kg	120 U	97 U	97 UT
Aroclor 1248	µg/kg	380 U	280 U	280 UT
Aroclor 1254	µg/kg	120 U	44 U	44 UT
Aroclor 1260	µg/kg	1600	920	1600 T
RI Calc Total PCB Aroclors	µg/kg	1600 T	920 T	1260 T
FS Calc Total PCB Aroclors	µg/kg	2190 T	1180 T	1520 T
PCB Congeners				
PCB 1	µg/kg	0.173	0.182	0.178 T
PCB 2	µg/kg	0.0143 U	0.025 U	0.0143 UT
PCB 3	µg/kg	0.0323 J	0.0432 J	0.0378 JT
PCB 4	µg/kg	31.4	29.6	30.5 T
PCB 5	µg/kg	0.0683 U	0.0679 U	0.0679 UT
PCB 6	µg/kg	0.329	0.296	0.313 T
PCB 7	µg/kg	0.0631 U	0.164	0.164 T
PCB 8	µg/kg	0.583	0.879	0.731 T
PCB 9	µg/kg	0.0692 U	0.0687 U	0.0687 UT
PCB 10	µg/kg	0.451	0.15 U	0.451 T
PCB 11	µg/kg	0.862	1.41	1.14 T
PCBs 12 + 13	µg/kg	0.0691 U	0.0687 U	0.0687 UT
PCB 14	µg/kg	0.0698 U	0.0694 U	0.0694 UT
PCB 15	µg/kg	0.306	0.136	0.221 T
PCB 16	µg/kg	0.0665 U	0.257 J	0.257 JT
PCB 17	µg/kg	37.1	50.5	43.8 T
PCB 18	µg/kg	0.0414 U	0.0239 U	0.0239 UT
PCB 19	µg/kg	95.9 J	116 J	106 JT
PCBs 20 + 28	µg/kg	12.2	12.4	12.3 T
PCBs 21 + 33	µg/kg	3.38 J	4.25	3.82 JT
PCB 22	µg/kg	0.232 U	0.138	0.138 T
PCB 23	µg/kg	0.221 U	0.0437 U	0.0437 UT
PCB 24	µg/kg	0.0388 U	0.0224 U	0.0224 UT
PCB 25	µg/kg	1.62	1.07	1.35 T
PCBs 26 + 29	µg/kg	2.56	1.71	2.14 T
PCB 27	µg/kg	8.24	10.9	9.57 T
PCB 30	µg/kg	4.68	4.03	4.36 T
PCB 31	µg/kg	2.85	2.41	2.63 T
PCB 32	µg/kg	12.8	13.4	13.1 T
PCB 34	µg/kg	0.255 U	0.0503 U	0.0503 UT
PCB 35	µg/kg	0.249 U	0.0493 U	0.0493 UT
PCB 36	µg/kg	0.23 U	1.15	1.15 T
PCB 37	µg/kg	0.276 U	0.117	0.117 T
PCB 38	µg/kg	0.256 U	0.0506 U	0.0506 UT
PCB 39	µg/kg	0.218 U	0.043 U	0.043 UT
PCBs 40 + 71	µg/kg	15.1	9.88	12.5 T
PCB 41	µg/kg	0.0657 U	0.0319 U	0.0319 UT
PCB 42	µg/kg	2.28	1.11	1.7 T
PCBs 43 + 73	µg/kg	0.0457 U	0.0222 U	0.0222 UT
PCBs 44 + 47 + 65	µg/kg	148	141	145 T
PCBs 45 + 51	µg/kg	110	102	106 T
PCB 46	µg/kg	5.13	1.79	3.46 T
PCB 48	µg/kg	0.0506 U	0.0246 U	0.0246 UT

Table J-1
Analytical Results and Data Reduction of Bulk Sediment Field Duplicates

Analyte	Sample ID	RM11E-PW004-SED		
	Unit	Parent	Duplicate	Average
PCB 49	µg/kg	91.1	48.2	69.7 T
PCBs 50 + 53	µg/kg	105	50.3	77.7 T
PCB 52	µg/kg	117	41	79 T
PCB 54	µg/kg	24.5	27.7	26.1 T
PCB 55	µg/kg	0.0583 U	0.0283 U	0.0283 UT
PCB 56	µg/kg	0.239	0.202	0.221 T
PCB 57	µg/kg	0.0431 U	0.0209 U	0.0209 UT
PCB 58	µg/kg	0.0413 U	0.02 U	0.02 UT
PCBs 59 + 62 + 75	µg/kg	3.54	3.62	3.58 T
PCB 60	µg/kg	0.0431 U	0.0422 U	0.0422 UT
PCB 61	µg/kg	0.0446 U	0.0217 U	0.0217 UT
PCB 63	µg/kg	0.0426 U	0.22	0.22 T
PCB 64	µg/kg	0.957	0.696	0.827 T
PCB 66	µg/kg	3.04	3.2	3.1 T
PCB 67	µg/kg	0.0377 U	0.0183 U	0.0183 UT
PCB 68	µg/kg	0.59 J	0.78	0.69 JT
PCB 69	µg/kg	0.0316 U	0.0154 U	0.0154 UT
PCBs 70 + 74 + 76	µg/kg	2.71	2.37	2.54 T
PCB 72	µg/kg	0.0393 U	0.198 J	0.198 JT
PCB 77	µg/kg	0.048 J	0.112 J	0.08 JT
PCB 78	µg/kg	0.0462 U	0.0452 U	0.0452 UT
PCB 79	µg/kg	0.0409 U	0.04 U	0.04 UT
PCB 80	µg/kg	0.038 U	0.0372 U	0.0372 UT
PCB 81	µg/kg	0.0475 U	0.0846 J	0.0846 JT
PCB 82	µg/kg	0.12 U	0.116 U	0.116 UT
PCBs 83 + 99	µg/kg	8.32	13.5	10.91 T
PCB 84	µg/kg	1.72 J	1.32	1.52 JT
PCB 85	µg/kg	1.65 J	0.0969 U	1.65 JT
PCBs 86 + 87 + 97 + 109 + 119 + 125	µg/kg	6.78	9.34	8.03 T
PCB 88	µg/kg	0.034 U	0.0276 U	0.0276 UT
PCB 89	µg/kg	0.102 U	0.0982 U	0.0982 UT
PCBs 90 + 101 + 113	µg/kg	15.5	21.5	18.5 T
PCB 91	µg/kg	20.4	23.8	22.1 T
PCB 92	µg/kg	4.06	5.31	4.69 T
PCB 93	µg/kg	0.0343 U	0.0278 U	0.0278 UT
PCB 94	µg/kg	2.4	2.94	2.67 T
PCBs 95 + 100	µg/kg	32	33.5	33 T
PCB 96	µg/kg	6.25	3.71	4.98 T
PCBs 98 + 102	µg/kg	1.74	2.19	1.97 T
PCB 103	µg/kg	6.04	5.37	5.71 T
PCB 104	µg/kg	3.05	3.22	3.14 T
PCB 105	µg/kg	0.536 J	0.48 J	0.51 JT
PCB 106	µg/kg	0.117 U	0.0212 U	0.0212 UT
PCB 107	µg/kg	0.557	0.919	0.738 T
PCBs 108 + 124	µg/kg	0.11 U	0.0593 J	0.0593 JT
PCBs 110 + 115	µg/kg	5.01	5.92	5.47 T
PCB 111	µg/kg	0.0653 U	0.139	0.139 T
PCB 112	µg/kg	0.069 U	0.0665 U	0.0665 UT
PCB 114	µg/kg	0.103 U	0.109	0.109 T
PCBs 116 + 117	µg/kg	1.82	2.67	2.25 T
PCB 118	µg/kg	1.99	2.27	2.13 T
PCB 120	µg/kg	0.0653 U	0.369	0.369 T
PCB 121	µg/kg	0.696	0.888	0.792 T
PCB 122	µg/kg	0.13 U	0.0549 J	0.0549 JT
PCB 123	µg/kg	0.101 U	0.0211 U	0.0211 UT
PCB 126	µg/kg	0.316 J	0.729 J	0.523 JT
PCB 127	µg/kg	0.118 U	0.0229 J	0.0229 JT
PCB 128	µg/kg	0.565	0.831	0.698 T
PCBs 129 + 138 + 163	µg/kg	20	24.7	22 T
PCB 130	µg/kg	0.365	0.587	0.476 T
PCB 131	µg/kg	0.0422 U	0.213 U	0.0422 UT
PCB 132	µg/kg	3.57	4.53	4.05 T
PCB 133	µg/kg	1.42	2.3	1.9 T
PCB 134	µg/kg	0.555	1.13	0.843 T
PCBs 135 + 154	µg/kg	3.51 J	6.7	5.1 JT
PCB 136	µg/kg	5.82	6.99	6.41 T
PCB 137	µg/kg	0.258 J	0.572	0.415 JT

Table J-1
Analytical Results and Data Reduction of Bulk Sediment Field Duplicates

Analyte	Sample ID	RM11E-PW004-SED		
	Unit	Parent	Duplicate	Average
PCBs 139 + 140	µg/kg	0.0431 U	0.56	0.56 T
PCB 141	µg/kg	2.12	3.86	2.99 T
PCB 142	µg/kg	0.0503 U	0.254 U	0.0503 UT
PCB 143	µg/kg	0.0481 U	0.243 U	0.0481 UT
PCB 144	µg/kg	0.293 J	0.68 J	0.5 JT
PCB 145	µg/kg	0.0295 U	0.017 U	0.017 UT
PCB 146	µg/kg	4.92	6.34	5.63 T
PCBs 147 + 149	µg/kg	27.3	47.7	37.5 T
PCB 148	µg/kg	0.562 J	0.876	0.719 JT
PCB 150	µg/kg	1.53 J	2.46	1.2 JT
PCB 151	µg/kg	7.59	11.3	9.45 T
PCB 152	µg/kg	0.0328 U	1.72	1.72 T
PCBs 153 + 168	µg/kg	17.4	26.1	21.8 T
PCB 155	µg/kg	0.3 J	0.89 J	0.6 JT
PCBs 156 + 157	µg/kg	0.736	0.937	0.837 T
PCB 158	µg/kg	0.76	1.26	1.01 T
PCB 159	µg/kg	0.196 J	0.443	0.32 JT
PCB 160	µg/kg	0.0203 U	0.103 U	0.0203 UT
PCB 161	µg/kg	0.0348 U	0.175 U	0.0348 UT
PCB 162	µg/kg	0.114 U	0.0655 U	0.0655 UT
PCB 164	µg/kg	0.822	1.45	1.14 T
PCB 165	µg/kg	0.2 J	0.552 J	0.4 JT
PCB 166	µg/kg	0.0363 U	0.183 U	0.0363 UT
PCB 167	µg/kg	0.259	0.44	0.35 T
PCB 169	µg/kg	0.177 J	0.428 J	0.303 JT
PCB 170	µg/kg	9.33	14	12 T
PCBs 171 + 173	µg/kg	2.74	5.05	3.9 T
PCB 172	µg/kg	1.77	3.01	2.39 T
PCB 174	µg/kg	8.25	16.1	12.2 T
PCB 175	µg/kg	0.228 J	0.463	0.346 JT
PCB 176	µg/kg	0.927	2.03	1.48 T
PCB 177	µg/kg	6.8	10.2	8.5 T
PCB 178	µg/kg	2.85	4.92	3.89 T
PCB 179	µg/kg	4.67	10.3	7.49 T
PCBs 180 + 193	µg/kg	20.6	34.2	27.4 T
PCB 181	µg/kg	0.0498 U	0.163 J	0.163 JT
PCB 182	µg/kg	0.0385 U	0.0312 U	0.0312 UT
PCB 183	µg/kg	5.8	12.8	9.3 T
PCB 184	µg/kg	0.0251 U	0.0377 J	0.0377 JT
PCB 185	µg/kg	1.15	2.02	1.59 T
PCB 186	µg/kg	0.0278 U	0.0225 U	0.0225 UT
PCB 187	µg/kg	12.4	19.8	16.1 T
PCB 188	µg/kg	0.598	1.63	1.11 T
PCB 189	µg/kg	0.263	0.367	0.315 T
PCB 190	µg/kg	2.22	3.22	2.72 T
PCB 191	µg/kg	0.414	0.63	0.52 T
PCB 192	µg/kg	0.0438 U	0.0742 U	0.0438 UT
PCB 194	µg/kg	6.53	9.3	7.9 T
PCB 195	µg/kg	2.7	3.77	3.2 T
PCB 196	µg/kg	3.63	5.42	4.53 T
PCB 197	µg/kg	0.263	0.504	0.389 T
PCBs 198 + 199	µg/kg	5.97	9.24	7.61 T
PCB 200	µg/kg	0.709	1.23	0.97 T
PCB 201	µg/kg	0.769	1.52	1.14 T
PCB 202	µg/kg	1.24	2.55	1.9 T
PCB 203	µg/kg	3.42	5.56	4.49 T
PCB 204	µg/kg	0.0303 U	0.0273 U	0.0273 UT
PCB 205	µg/kg	0.324	0.473	0.399 T
PCB 206	µg/kg	1.94	2.67	2.31 T
PCB 207	µg/kg	0.259 J	0.364	0.312 JT
PCB 208	µg/kg	0.33	0.474	0.4 T
PCB 209	µg/kg	0.147	0.129 J	0.138 JT
RI Calc Total PCB Congeners	µg/kg	1180 JT	1170 JT	1180 JT
FS Calc Total PCB Congeners	µg/kg	1180 JT	1170 JT	1180 JT

Table J-1
Analytical Results and Data Reduction of Bulk Sediment Field Duplicates

Analyte	Sample ID	RM11E-PW004-SED		
	Unit	Parent	Duplicate	Average
PCB Congeners Homologs				
MonoCBTOT	µg/kg	0.206	0.225	0.216 T
DiCBTOT	µg/kg	34	32.5	33 T
TriCBTOT	µg/kg	181	218	200 T
TetraCBTOT	µg/kg	629	435	532 T
PentaCBTOT	µg/kg	121	140	131 T
HexaCBTOT	µg/kg	101	156	129 T
HeptaCBTOT	µg/kg	81	141	111 T
OctaCBTOT	µg/kg	25.6	39.6	32.6 T
NonaCBTOT	µg/kg	2.52	3.51	3.02 T

Notes:

All sample results are reported on a dry-weight basis.

RI Calc = This result was calculated using the Remedial Investigation (RI) data rules for the Portland Harbor as described in Section 7.3 of the Final Supplemental Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GSI and DOF, 2013).

FS Calc = This result was calculated using the Feasibility Study (FS) data rules for the Portland Harbor, which are consistent with the risk assessment and background data set data rules, as described in Section 7.3 of the Final Supplemental RI/FS Work Plan (GSI and DOF, 2013).

Definition of data qualifiers:

U = The material was analyzed for, but was not detected. The associated numerical value is the method detection limit (MDL).

J = The associated numerical value is an estimated quantity.

T = The associated numerical value was mathematically derived (e.g., from summing multiple analyte results such as Aroclors, or calculating the average of multiple results for a single analyte).

Table J-2
ALS PCB Congener Splits in Sediment-Exposed and Surface Water Exposed Polyethylene

Analyte	Station ID	RM11E-PW004		RM11E-PW004	
	Exposure Matrix	Porewater		Surface Water	
	Sample ID	Parent	Duplicate	Parent	Duplicate
	Units	RM11E-PWP004B	RM11E-PWP504	RM11E-PWW004B	RM11E-PWW504
PCB Congeners					
PCB 1	µg/kg	3.06	3.31	0.265 U	0.566 U
PCB 2	µg/kg	0.205 U	0.224 U	0.339 U	0.6 U
PCB 3	µg/kg	0.209 U	0.222 U	0.357 U	0.579 U
PCB 4	µg/kg	314	394	2.11	2.27 J
PCB 5	µg/kg	0.102 U	0.0927 U	0.142 U	0.287 U
PCB 6	µg/kg	2.72	2.92	0.132 U	0.281 U
PCB 7	µg/kg	0.907 J	1.06 J	0.12 U	0.262 U
PCB 8	µg/kg	9.77	11.1	0.121 U	0.268 U
PCB 9	µg/kg	1.15 J	1.09 J	0.141 U	0.278 U
PCB 10	µg/kg	17.6	14	0.0974 U	0.222 U
PCB 11	µg/kg	2.49 J	0.957 J	0.696 J	1.04 J
PCBs 12 + 13	µg/kg	0.712 J	0.916 J	0.131 U	0.267 U
PCB 14	µg/kg	0.0976 U	0.0906 U	0.136 U	0.281 U
PCB 15	µg/kg	6.02	5.78	0.392 J	0.27 U
PCB 16	µg/kg	1.74 J	1.82 J	0.661 U	1.4 U
PCB 17	µg/kg	145	137	4.57	4.65
PCB 18	µg/kg	1.95 J	--	0.412 U	--
PCBs 18 + 30	µg/kg	--	20.9	--	0.981 U
PCB 19	µg/kg	601	653	8.52	9.31
PCBs 20 + 28[‡]	µg/kg	443	437	5.89	10.9
PCBs 21 + 33	µg/kg	9.07	6	0.509 U	0.905 U
PCB 22	µg/kg	0.84 U	0.921 J	0.591 U	0.972 U
PCB 23	µg/kg	0.773 U	0.373 U	0.544 U	1.02 U
PCB 24	µg/kg	0.27 U	0.313 U	0.366 U	0.833 U
PCB 25	µg/kg	3.45	7.78	0.432 U	0.75 U
PCBs 26 + 29	µg/kg	4.36	4.43 J	0.587 U	1.02 U
PCB 27	µg/kg	48	39.6	1.39 J	0.837 U
PCB 30	µg/kg	23.4	--	0.94 J	--
PCB 31	µg/kg	9.89	10.3	0.532 U	0.949 U
PCB 32	µg/kg	65.9	62.4	2.15	2.18 J
PCB 34	µg/kg	0.911 U	0.384 U	0.641 U	1.05 U
PCB 35	µg/kg	0.861 U	0.378 U	0.606 U	1.03 U
PCB 36	µg/kg	0.775 U	0.334 U	0.545 U	0.906 U
PCB 37	µg/kg	1.08 U	0.403 U	0.756 U	1.08 U
PCB 38	µg/kg	0.884 U	0.376 U	0.622 U	1.03 U
PCB 39	µg/kg	0.733 U	0.324 U	0.515 U	0.88 U
PCBs 40 + 71	µg/kg	34.5	32.2	3.62 J	3.95 J
PCB 41	µg/kg	0.575 U	0.168 U	0.562 U	0.364 U
PCB 42	µg/kg	5.63 J	5.58 J	1.01 J	0.958 J
PCBs 43 + 73	µg/kg	0.406 U	0.13 U	0.397 U	1.48 J
PCBs 44 + 47 + 65[‡]	µg/kg	718	710	88.4	90.7
PCBs 45 + 51	µg/kg	215	231	18.6	17.4
PCB 46	µg/kg	10.5	9.59	0.902 J	0.385 U
PCB 48	µg/kg	2.54 J	1.87 J	0.419 U	0.432 J
PCB 49	µg/kg	182	--	24.3	--
PCBs 49 + 69	µg/kg	--	153	--	18.9 J
PCBs 50 + 53	µg/kg	244	225	16.3	14.9 J
PCB 52	µg/kg	224	177	25.8	20.2
PCB 54[‡]	µg/kg	387	451	6.35	9.29
PCB 55	µg/kg	0.379 U	0.103 U	0.37 U	0.223 U
PCB 56	µg/kg	1.97 J	1.24 J	0.375 J	0.621 U
PCB 57	µg/kg	0.376 U	0.112 U	0.368 U	0.242 U
PCB 58	µg/kg	5.78	0.508 J	1.02 J	0.217 U
PCBs 59 + 62 + 75	µg/kg	9.99 J	9.63 J	2 J	1.79 J
PCB 60	µg/kg	0.224 U	0.376 J	0.21 U	0.602 U
PCB 61	µg/kg	0.353 U	0.107 U	0.345 U	0.23 U
PCB 63	µg/kg	0.341 U	0.108 U	0.334 U	0.233 U
PCB 64	µg/kg	3.49	3.59 J	0.645 J	0.899 J
PCB 66	µg/kg	10.5	9.09	2.65 J	2.52 J
PCB 67	µg/kg	0.326 U	0.103 U	0.319 U	0.221 U
PCB 68	µg/kg	1.44 J	1.92 J	0.307 U	0.716 J
PCB 69	µg/kg	2.8 J	--	0.276 U	--
PCBs 70 + 74 + 76	µg/kg	13.8	12.7 J	4.01 J	3.69 J
PCB 72	µg/kg	0.34 U	0.107 U	0.332 U	0.23 U
PCB 77	µg/kg	0.36 J	6.5	0.268 U	6.4 J
PCB 78	µg/kg	0.242 U	0.212 U	0.227 U	0.632 U
PCB 79	µg/kg	13.1	13	5.4	6.19 J
PCB 80	µg/kg	0.514 J	0.561 J	0.195 J	0.557 U

Table J-2
ALS PCB Congener Splits in Sediment-Exposed and Surface Water Exposed Polyethylene

Analyte	Station ID	RM11E-PW004		RM11E-PW004	
	Exposure Matrix	Porewater		Surface Water	
	Sample ID	Parent	Duplicate	Parent	Duplicate
	Units	RM11E-PWP004B	RM11E-PWP504	RM11E-PWW004B	RM11E-PWW504
PCB 81	µg/kg	0.29 U	0.226 U	0.265 U	0.661 U
PCB 82	µg/kg	1.44 U	0.313 U	1.61 U	0.592 U
PCBs 83 + 99	µg/kg	41.3	41	10.7	9.36 J
PCB 84	µg/kg	15.8	14.5	2.66 J	2.27 J
PCB 85	µg/kg	0.68 U	--	0.758 U	--
PCBs 85 + 116 + 117	µg/kg	--	3.39 J	--	0.42 U
PCBs 86 + 87 + 97 + 109 + 119 +125[‡]	µg/kg	549	562	231	245
PCB 88	µg/kg	0.348 U	0.244 U	0.659 U	0.609 U
PCB 89	µg/kg	0.922 U	0.247 U	1.03 U	0.616 U
PCBs 90 + 101 + 113	µg/kg	150	141	31.7	31.5 J
PCB 91	µg/kg	55.8	62.3	12.1	11
PCB 92	µg/kg	28	25.6	6.21	6.19 J
PCB 93	µg/kg	0.367 U	--	0.695 U	--
PCBs 93 + 100	µg/kg	--	31.4	--	8.71 J
PCB 94	µg/kg	12.1	10.7	2.17 J	2.86 J
PCB 95	µg/kg	--	380	--	58
PCBs 95 + 100	µg/kg	224	--	38.1	--
PCB 96	µg/kg	14.6	14.7	1.89 J	1.98 J
PCBs 98 + 102	µg/kg	11.8 J	10.8 J	2.04 J	2.1 J
PCB 103	µg/kg	20.7	21.8	5.15	4.71 J
PCB 104	µg/kg	4.36	5.78	1.14 J	1.08 J
PCB 105	µg/kg	3.73	3.74	1.85 J	1.98 J
PCB 106	µg/kg	1.26 U	0.457 U	1.01 U	0.436 U
PCB 107	µg/kg	1.12 U	1.9 J	0.886 U	0.724 J
PCBs 108 + 124	µg/kg	1.17 U	0.437 U	0.93 U	0.417 U
PCBs 110 + 115	µg/kg	59.6	53.4	11.6	13.3 J
PCB 111[‡]	µg/kg	529	685	530	711
PCB 112	µg/kg	0.549 J	0.211 U	0.517 U	0.4 U
PCB 114	µg/kg	1.37 U	0.427 U	1.05 U	0.418 U
PCBs 117 + 116	µg/kg	2.84 J	--	0.547 U	--
PCB 118	µg/kg	21	15.6	6.72	5.65
PCB 120	µg/kg	0.488 J	0.191 U	0.484 U	0.362 U
PCB 121	µg/kg	0.385 U	0.192 U	0.429 U	0.363 U
PCB 122	µg/kg	1.38 U	0.48 U	1.1 U	0.458 U
PCB 123	µg/kg	1.32 U	0.44 U	1.05 U	0.415 U
PCB 126	µg/kg	1.34 U	0.421 U	1.03 U	0.422 U
PCB 127	µg/kg	1.21 U	0.432 U	0.963 U	0.413 U
PCB 128	µg/kg	5.03 J	--	0.659 U	--
PCBs 128 + 166	µg/kg	--	5.39 J	--	0.352 U
PCBs 129 + 138 + 163	µg/kg	136	117	41.7	34.1 J
PCB 130	µg/kg	1.81 U	3.84 J	0.757 U	0.466 U
PCB 131	µg/kg	1.34 U	0.231 U	0.559 U	0.361 U
PCB 132	µg/kg	41.1	36.7	10	10.4
PCB 133	µg/kg	4.07	5.09 J	0.698 U	0.446 U
PCB 134	µg/kg	5.97 J	5.24 J	0.533 U	0.36 U
PCBs 135 + 151	µg/kg	--	99.1	--	27.1
PCBs 135 + 154	µg/kg	23.8	--	6.89 J	--
PCB 136	µg/kg	52.2	47.1	11.5	11.1
PCB 137	µg/kg	1.45 U	0.249 U	0.607 U	0.389 U
PCBs 139 + 140	µg/kg	1.42 U	0.251 U	0.593 U	0.393 U
PCB 141	µg/kg	31.5	26.5	10	8 J
PCB 142	µg/kg	1.83 U	0.297 U	0.768 U	0.464 U
PCB 143	µg/kg	1.92 U	0.308 U	0.806 U	0.482 U
PCB 144	µg/kg	11	17.5	2.45 J	5.14 J
PCB 145	µg/kg	0.119 U	0.078 U	0.174 U	0.102 U
PCB 146	µg/kg	22.1	27.4	7.39	7.07 J
PCBs 147 + 149	µg/kg	178	133	44.3	40.6
PCB 148	µg/kg	1.79 J	2.41 J	0.388 J	0.597 J
PCB 150	µg/kg	3.96	3.92 J	1.01 J	1.11 J
PCB 151	µg/kg	92.8	--	22.5	--
PCB 152	µg/kg	0.143 U	2.02 J	0.209 U	0.515 J
PCBs 153 + 168[‡]	µg/kg	735	751	943	978
PCB 154	µg/kg	--	9.25 J	--	1.31 J
PCB 155	µg/kg	0.364 J	0.506 J	0.174 U	0.108 U
PCBs 156 + 157	µg/kg	4.69	4.15 J	1.67 J	1.47 J
PCB 158	µg/kg	25.7	24.7	33.3	35.6
PCB 159	µg/kg	0.894 J	1.28 J	0.531 U	0.332 U
PCB 160	µg/kg	0.698 U	0.138 U	0.293 U	0.216 U
PCB 161	µg/kg	1.15 U	0.204 U	0.481 U	0.318 U

Table J-2
ALS PCB Congener Splits in Sediment-Exposed and Surface Water Exposed Polyethylene

Analyte	Station ID	RM11E-PW004		RM11E-PW004	
	Exposure Matrix	Porewater		Surface Water	
	Sample ID	Parent	Duplicate	Parent	Duplicate
	Units	RM11E-PWP004B	RM11E-PWP504	RM11E-PWW004B	RM11E-PWW504
PCB 162	µg/kg	0.456 U	0.654 J	0.504 U	0.306 U
PCB 164	µg/kg	8.11	7.95	0.505 U	0.318 U
PCB 165	µg/kg	1.16 U	0.202 U	0.484 U	0.316 U
PCB 166	µg/kg	1.2 U	--	0.501 U	--
PCB 167	µg/kg	1.92 J	1.73 J	0.531 J	0.686 J
PCB 169	µg/kg	0.395 U	0.189 U	0.431 U	0.268 U
PCB 170	µg/kg	20.7	26.4	8.45	6.33 J
PCBs 171 + 173	µg/kg	7.53	9.65 J	2.52 J	2.08 J
PCB 172	µg/kg	3.76	5.34 J	1.33 J	1.22 J
PCB 174	µg/kg	32	36.1	9.28	8.84 J
PCB 175	µg/kg	1.95 J	2.01 J	1.86 J	1.86 J
PCB 176	µg/kg	4.46	5.23 J	0.275 U	0.195 U
PCB 177	µg/kg	17.9	21.6	6.52	5.67 J
PCB 178‡	µg/kg	555	583	997	1060
PCB 179	µg/kg	20.5	23.4	5.85	5.14 J
PCBs 180 + 193	µg/kg	42.6	57.1	15.2	13.3 J
PCB 181	µg/kg	0.502 U	0.192 U	0.646 U	0.289 U
PCB 182	µg/kg	0.19 J	0.0771 U	0.352 U	0.237 U
PCB 183	µg/kg	16.9	15.8	5.46 J	5.67 J
PCB 184	µg/kg	0.115 U	0.0554 U	0.236 U	0.17 U
PCB 185	µg/kg	3.32 J	3.69 J	1.33 J	0.897 J
PCB 186	µg/kg	0.126 U	0.0587 U	0.257 U	0.18 U
PCB 187	µg/kg	36.2	49.2	11.6	11.4
PCB 188	µg/kg	0.159 U	0.0804 U	0.328 U	0.232 U
PCB 189	µg/kg	0.665 J	0.136 U	0.487 U	0.222 U
PCB 190	µg/kg	4.61	5.33 J	1.92 J	1.24 J
PCB 191	µg/kg	0.864 J	1.16 J	0.555 U	0.348 J
PCB 192	µg/kg	0.423 U	0.161 U	0.545 U	0.243 U
PCB 194	µg/kg	4.81	7.51	2.12 J	1.84 J
PCB 195	µg/kg	2.53 J	3.62 J	0.917 J	0.762 J
PCB 196	µg/kg	3.72	4.52 J	1.76 J	1.16 J
PCB 197	µg/kg	0.272 J	0.435 J	0.371 U	0.139 U
PCBs 198 + 199	µg/kg	6.61	9.25 J	3.28 J	2.4 J
PCB 200	µg/kg	0.941 J	1.45 J	0.413 U	0.311 J
PCB 201	µg/kg	0.855 J	1.37 J	0.396 U	0.25 J
PCB 202	µg/kg	1.73 J	2.28	0.8 J	0.897 J
PCB 203	µg/kg	3.04 J	5.08 J	1.54 J	1.01 J
PCB 204	µg/kg	0.186 U	0.0721 U	0.41 U	0.154 U
PCB 205	µg/kg	0.315 J	0.52 J	0.508 U	0.227 J
PCB 206	µg/kg	0.549 J	0.863 J	0.703 J	1.49 U
PCB 207	µg/kg	0.217 U	0.188 U	0.373 U	0.571 U
PCB 208	µg/kg	0.19 U	0.233 J	0.338 U	0.547 U
PCB 209	µg/kg	0.244 J	0.0928 U	1.26 J	0.272 U
Total PCBs					
Total PCBs (RI Calculation)[1]	µg/kg	3810 JT	3990 JT	538 JT	539 JT

Notes:

‡ performance reference compound

Field duplicate samples RM11E-PWW504 and RM11E-PWP504 were analyzed in a separate batch from corresponding parent samples. Occasionally, co-eluting congeners were reported by the lab in field duplicate samples that were reported as individual congeners in parent samples. To avoid double counting parent samples were carried forward for mapping and evaluation purposes.

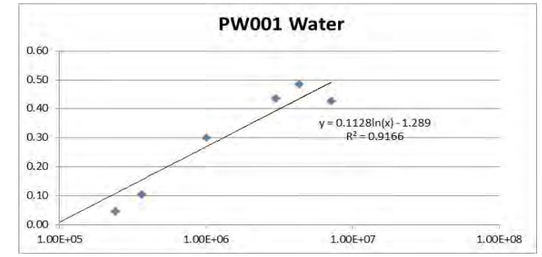
[1] Performance reference compounds excluded from RI calculation sum.

Appendix K

MIT Surface Water and Porewater Estimations

Station PW001. MIT results

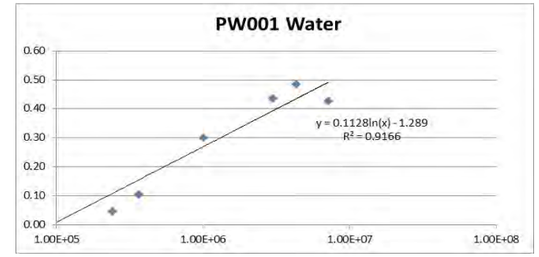
Performance Reference Compounds				PW001 Sediment				PW001 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	**16100**	**8899**	**0.55**	**0.45**	16100	758	0.05	0.95	PCB 28
PCB 54	4	4.92	8.38E+04	**13500**	**4741**	**0.35**	**0.65**	13500	585	0.04	0.96	PCB 54
PCB 47	4	5.56	3.66E+05	**15100**	**9367**	**0.62**	**0.38**	15100	1602	0.11	0.89	PCB 47
PCB 97	5	6.00	1.01E+06	**17700**	**13550**	**0.77**	**0.23**	17700	5310	0.30	0.70	PCB 97
PCB 111	5	6.47	2.97E+06	22600	16545	0.73	0.27	22600	9872	0.44	0.56	PCB 111
PCB 153	6	6.63	4.30E+06	20000	15608	0.78	0.22	20000	9693	0.48	0.52	PCB 153
PCB 178	7	6.85	7.13E+06	18500	12489	0.68	0.32	18500	7878	0.43	0.57	PCB 178



Analytes and Partitioning Coefficients					PW001 Sediment Column								PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibrium		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	from PRC Calculator				PE Concentration ÷ (1-% PRC Remaining)				=0.1128*LN(10^logKpew)-1.289 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
1	1	1	4.46	4.17	0.90								0.01	0.99						
2	2	1	4.69	4.40	0.86								0.01	0.99						
3	3	1	4.76	4.47	0.86								0.01	0.99						
4	4+10	2	4.65	4.36	0.86		54.5		63.2		2.74		0.01	0.99						
5	5+8	2	5.02	4.74	0.73		11.0		15.0		0.28		0.01	0.99						
6	6	2	5.06	4.77	0.74		2.4		3.2		0.05		0.01	0.99						
7	7+9	2	5.07	4.78	0.72		2.1		2.9		0.05		0.01	0.99						
11	11	2	5.28	4.99	0.67								0.01	0.99						
12	12	2	5.22	4.93	0.69								0.01	0.99						
13	13	2	5.29	5.00	0.66								0.01	0.99						
14	14	2	5.28	4.99	0.67								0.01	0.99						
15	15	2	5.30	5.01	0.66		22.6		34.4		0.33		0.01	0.99	7.93		8.0		0.0780	
16	16+32	3	5.32	5.04	0.60		25.5		42.3		0.39		0.02	0.98	1.65		1.7		0.0155	
17	17	3	5.25	4.96	0.66		30.3		46.1		0.50		0.01	0.99	3.74		3.8		0.0412	
18	18	3	5.24	4.95	0.66		18.2		27.5		0.31		0.01	0.99						
19	19	3	5.02	4.73	0.74		167.4		226.9		4.20		0.01	0.99	4.70		4.7		0.0878	
20	20+21+33	3	5.56	5.27	0.51		35.8		70.2		0.37		0.08	0.92						
22	22	3	5.58	5.29	0.53								0.09	0.91						
23	23 + 34	3	5.62	5.33	0.49								0.10	0.90						
24	24+27	3	5.40	5.11	0.58		18.8		32.6		0.25		0.04	0.96						
25	25+26	3	5.67	5.38	0.46		44.8		96.3		0.40		0.11	0.89	44.57		50.0		0.2092	
28	28+31	3	5.67	5.38	0.46								0.11	0.89						
29	29	3	5.60	5.31	0.52								0.09	0.91						
30	30	3	5.44	5.15	0.58		24.4		41.8		0.29		0.05	0.95	1.98		2.1		0.0147	
35	35	3	5.82	5.53	0.43								0.15	0.85						
36	36	3	5.88	5.59	0.40		1.6		3.9		0.01		0.16	0.84						
37	37	3	5.83	5.54	0.42		5.8		13.6		0.04		0.15	0.85						
38	38	3	5.76	5.47	0.45								0.13	0.87						
40	40	4	5.66	5.37	0.47		4.4		9.2		0.04		0.11	0.89						
41	41+64+68	4	6.03	5.74	0.31		7.4		23.6		0.04		0.20	0.80	2.93		3.7		0.0067	
42	42	4	5.76	5.47	0.43		13.5		31.1		0.10		0.13	0.87	3.32		3.8		0.0129	
43	43	4	5.75	5.46	0.44								0.13	0.87						
44	44	4	5.75	5.46	0.44		21.2		48.3		0.17		0.13	0.87	5.22		6.0		0.0207	
45	45	4	5.53	5.24	0.53		2.0		3.9		0.02		0.07	0.93						
46	46	4	5.53	5.24	0.53		5.4		10.3		0.06		0.07	0.93						
47	47+48+75	4	5.91	5.62	0.36								0.17	0.83						
49	49	4	5.85	5.56	0.40		166.1		415.5		1.14		0.16	0.84	27.29		32.3		0.0884	
50	50	4	5.63	5.34	0.49		9.3		19.0		0.09		0.10	0.90	1.24		1.4		0.0062	
51	51	4	5.63	5.34	0.49		63.9		131.3		0.60		0.10	0.90	8.49		9.4		0.0428	
52	52	4	5.84	5.55	0.40		101.3		251.1		0.70		0.15	0.85						
53	53	4	5.62	5.33	0.49		126.2		257.2		1.19		0.10	0.90	7.56		8.4		0.0389	
54	54	4	5.21	4.92	0.65								0.01	0.99						
56	56+60	4	6.11	5.82	0.29		23.6		82.7		0.12		0.22	0.78	6.88		8.9		0.0133	
57	57	4	6.17	5.88	0.29		10.6		37.0		0.05		0.24	0.76	5.17		6.8		0.0089	
58	58	4	6.17	5.88	0.29		1.9		6.7		0.01		0.24	0.76	1.37		1.8		0.0024	
59	59	4	5.95	5.66	0.36								0.18	0.82						
61	61	4	6.04	5.75	0.33								0.21	0.79						
62	62	4	5.89	5.60	0.38								0.17	0.83						
63	63	4	6.17	5.88	0.29								0.24	0.76						

Station PW001. MIT results

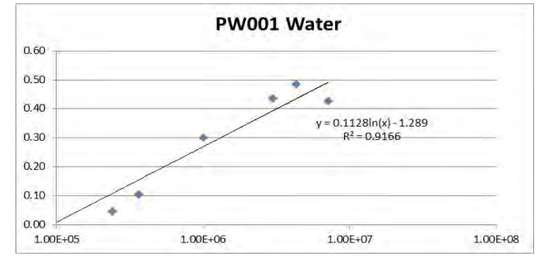
Performance Reference Compounds				PW001 Sediment				PW001 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	**16100**	**8899**	**0.55**	**0.45**	16100	758	0.05	0.95	PCB 28
PCB 54	4	4.92	8.38E+04	**13500**	**4741**	**0.35**	**0.65**	13500	585	0.04	0.96	PCB 54
PCB 47	4	5.56	3.66E+05	**15100**	**9367**	**0.62**	**0.38**	15100	1602	0.11	0.89	PCB 47
PCB 97	5	6.00	1.01E+06	**17700**	**13550**	**0.77**	**0.23**	17700	5310	0.30	0.70	PCB 97
PCB 111	5	6.47	2.97E+06	22600	16545	0.73	0.27	22600	9872	0.44	0.56	PCB 111
PCB 153	6	6.63	4.30E+06	20000	15608	0.78	0.22	20000	9693	0.48	0.52	PCB 153
PCB 178	7	6.85	7.13E+06	18500	12489	0.68	0.32	18500	7878	0.43	0.57	PCB 178



Analytes and Partitioning Coefficients					PW001 Sediment Column								PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	from PRC Calculator				PE Concentration ÷ (1-% PRC Remaining)				=0.1128*LN(10^logKpew)-1.289 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
65	65	4	5.86	5.57	0.40								0.16	0.84						
66	66+80	4	6.36	6.08	0.33		10.7		32.8		0.03		0.29	0.71	7.12		10.0		0.0084	
67	67	4	6.20	5.91	0.28		5.4		19.7		0.02		0.25	0.75	2.42		3.2		0.0039	
69	69+73 [1]	4	6.04	5.75	0.33		2.0		6.0		0.01		0.21	0.79						
70	70	4	6.20	5.91	0.28		8.2		29.5		0.04		0.25	0.75	2.10		2.8		0.0034	
71	71+72	4	6.14	5.86	0.27		16.4		60.5		0.08		0.23	0.77	4.59		6.0		0.0083	
73	73	4	6.04	5.75	0.33		7.1		21.5		0.04		0.21	0.79						
74	74	4	6.20	5.91	0.28		2.1		7.7		0.01		0.25	0.75						
76	76	4	6.13	5.84	0.30								0.23	0.77						
77	77	4	6.36	6.07	0.23								0.29	0.71						
78	78	4	6.35	6.06	0.23								0.29	0.71						
79	79	4	6.42	6.13	0.21								0.30	0.70						
81	81	4	6.36	6.07	0.23								0.29	0.71						
82	82	5	6.20	5.91	0.26		7.5		28.4		0.03		0.25	0.75						
83	83+109	5	6.38	6.10	0.19		1.6		8.3		0.01		0.29	0.71						
84	84	5	6.04	5.75	0.32		10.5		33.3		0.06		0.21	0.79	2.81		3.5		0.0062	
85	85+120	5	6.61	6.32	0.24								0.35	0.65						
86	86+**97**+125	5	6.36	6.07	0.20								0.29	0.71						
87	87+115	5	6.40	6.11	0.19								0.30	0.70						
88	88	5	6.07	5.78	0.31								0.21	0.79						
89	89+90+101	5	6.29	6.00	0.22		114.2		515.5		0.51		0.27	0.73	32.09		44.0		0.0436	
91	91	5	6.13	5.84	0.22		25.4		116.1		0.17		0.23	0.77	6.70		8.7		0.0125	
92	92	5	6.35	6.06	0.29		18.1		63.4		0.05		0.29	0.71	5.06		7.1		0.0061	
93	93	5	6.04	5.75	0.22								0.21	0.79						
94	94	5	6.13	5.84	0.32		6.1		19.5		0.03		0.23	0.77						
95	95+121	5	6.46	6.17	0.29		86.5		302.7		0.21		0.31	0.69	14.07		20.5		0.0139	
96	96	5	5.71	5.42	0.18		11.7		65.3		0.25		0.12	0.88	2.30		2.6		0.0099	
98	98+102	5	6.15	5.86	0.26		8.4		32.1		0.04		0.23	0.77	2.04		2.7		0.0037	
99	99	5	6.39	6.10	0.21		27.4		129.8		0.10		0.30	0.70	12.94		18.4		0.0145	
100	100	5	6.23	5.94	0.26		12.2		47.7		0.05		0.25	0.75	4.63		6.2		0.0071	
103	103	5	6.22	5.93	0.26		10.0		38.8		0.05		0.25	0.75	3.26		4.4		0.0051	
105	105	5	6.65	6.36	0.15		4.8		31.7		0.01		0.36	0.64						
106	106+118	5	6.69	6.41	0.13		26.1		200.5		0.08		0.37	0.63	12.38		19.8		0.0078	
107	107+108+123	5	6.72	6.43	0.13		7.3		57.5		0.02		0.38	0.62	3.32		5.4		0.0020	
110	110	5	6.48	6.19	0.19		60.6		321.2		0.21		0.32	0.68	11.50		16.9		0.0108	
111	**111**+116+117	5	6.56	6.27	0.16								0.34	0.66						
112	112	5	6.48	6.19	0.20								0.32	0.68						
113	113	5	6.54	6.25	0.17								0.34	0.66						
114	114	5	6.65	6.36	0.15								0.36	0.64						
119	119	5	6.58	6.29	0.17		5.3		31.8		0.02		0.35	0.65	2.37		3.6		0.0018	
122	122	5	6.64	6.35	0.15		4.6		30.2		0.01		0.36	0.64	8.33		13.0		0.0058	
124	124	5	6.73	6.44	0.14								0.38	0.62	1.91		3.1		0.0011	
126	126	5	6.89	6.60	0.11		10.1		92.2		0.02		0.43	0.57	9.35		16.3		0.0041	
127	127	5	6.95	6.66	0.10								0.44	0.56						
128	128	6	6.74	6.45	0.13		7.8		60.7		0.02		0.39	0.61	1.61		2.6		0.0009	
129	129	6	6.73	6.44	0.13								0.38	0.62						
130	130	6	6.80	6.51	0.12		3.9		32.5		0.01		0.40	0.60						
131	131	6	6.58	6.29	0.16								0.35	0.65						
132	132+**153**	6	6.78	6.50	0.11								0.40	0.60						

Station PW001. MIT results

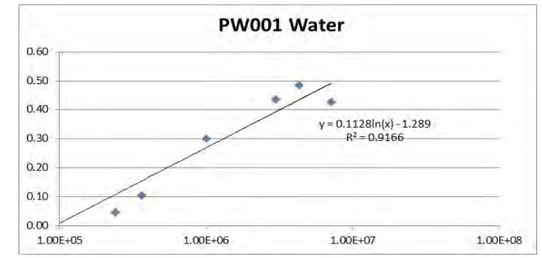
Performance Reference Compounds				PW001 Sediment				PW001 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	**16100**	**8899**	**0.55**	**0.45**	16100	758	0.05	0.95	PCB 28
PCB 54	4	4.92	8.38E+04	**13500**	**4741**	**0.35**	**0.65**	13500	585	0.04	0.96	PCB 54
PCB 47	4	5.56	3.66E+05	**15100**	**9367**	**0.62**	**0.38**	15100	1602	0.11	0.89	PCB 47
PCB 97	5	6.00	1.01E+06	**17700**	**13550**	**0.77**	**0.23**	17700	5310	0.30	0.70	PCB 97
PCB 111	5	6.47	2.97E+06	22600	16545	0.73	0.27	22600	9872	0.44	0.56	PCB 111
PCB 153	6	6.63	4.30E+06	20000	15608	0.78	0.22	20000	9693	0.48	0.52	PCB 153
PCB 178	7	6.85	7.13E+06	18500	12489	0.68	0.32	18500	7878	0.43	0.57	PCB 178



Analytes and Partitioning Coefficients					PW001 Sediment Column								PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	from PRC Calculator				PE Concentration ÷ (1-% PRC Remaining)				=0.1128*LN(10^logKpew)-1.289 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
133	133 + 165	6	6.97	6.68	0.06		3.4		56.3		0.01		0.45	0.55	3.21		5.8		0.0012	
134	134+143	6	6.58	6.29	0.17		7.6		45.8		0.02		0.34	0.66	2.67		4.1		0.0021	
135	135	6	6.64	6.35	0.15		35.0		238.0		0.11		0.36	0.64	16.45		25.7		0.0114	
137	137	6	6.83	6.54	0.11								0.41	0.59						
138	138+160	6	6.88	6.60	0.10		61.3		637.4		0.16		0.42	0.58	10.95		19.0		0.0048	
139	139+149	6	6.67	6.38	0.13		121.5		930.6		0.39		0.37	0.63	22.72		36.0		0.0149	
140	140	6	6.67	6.38	0.14								0.37	0.63						
141	141	6	6.82	6.53	0.12		30.0		259.3		0.08		0.41	0.59	6.22		10.5		0.0031	
142	142	6	6.51	6.22	0.17		22.5		129.7		0.08		0.33	0.67	18.93		28.1		0.0168	
144	144	6	6.67	6.38	0.14		9.6		67.8		0.03		0.37	0.63	1.32		2.1		0.0009	
145	145	6	6.25	5.96	0.08								0.26	0.74						
146	146+161	6	7.00	6.71	0.11		21.4		203.9		0.04		0.45	0.55	8.56		15.7		0.0031	
147	147	6	6.64	6.35	0.15		5.5		37.3		0.02		0.36	0.64	2.00		3.1		0.0014	
148	148	6	6.73	6.44	0.13								0.38	0.62						
151	151	6	6.64	6.35	0.15		55.0		374.5		0.17		0.36	0.64	11.84		18.5		0.0082	
152	152	6	6.22	5.93	0.25								0.25	0.75						
154	154	6	6.76	6.47	0.13		2.2		17.9		0.01		0.39	0.61						
155	155	6	6.41	6.12	0.20								0.30	0.70						
156	156	6	7.18	6.89	0.07		4.9		70.6		0.01		0.50	0.50						
157	157	6	7.18	6.89	0.07								0.50	0.50						
158	158	6	7.02	6.73	0.09		9.5		108.0		0.02		0.46	0.54						
159	159	6	7.24	6.95	0.06								0.52	0.48						
162	162	6	7.24	6.95	0.06								0.52	0.48						
163	163+164	6	7.01	6.72	0.07		41.0		607.7		0.12		0.46	0.54	4.57		8.4		0.0016	
166	166	6	6.93	6.64	0.10								0.44	0.56						
167	167	6	7.27	6.98	0.06		2.5		40.4		0.00		0.52	0.48						
168	168	6	7.11	6.82	0.08		32.6		421.8		0.06		0.48	0.52						
169	169	6	7.42	7.13	0.05								0.56	0.44						
170	170+190	7	7.38	7.09	0.05		14.7		284.0		0.02		0.55	0.45	4.99		11.1		0.0009	
171	171	7	7.11	6.82	0.07		7.1		94.5		0.01		0.48	0.52						
172	172+192	7	7.44	7.15	0.04		3.5		81.6		0.01		0.57	0.43						
173	173	7	7.02	6.73	0.08								0.46	0.54						
174	174+181	7	7.11	6.82	0.07		25.8		375.9		0.06		0.48	0.52	5.68		11.0		0.0017	
175	175	7	7.17	6.88	0.07		24.9		363.6		0.05		0.50	0.50	19.04		38.0		0.0050	
176	176	7	6.76	6.47	0.12		4.1		34.0		0.01		0.39	0.61						
177	177	7	7.08	6.79	0.08		15.9		203.6		0.03		0.48	0.52	3.75		7.1		0.0012	
178	178	7	7.14	6.853	0.07								0.49	0.51						
179	179	7	6.73	6.44	0.13		14.7		116.1		0.04		0.38	0.62	3.24		5.3		0.0019	
180	180+193	7	7.45	7.16	0.04		38.7		923.4		0.06		0.57	0.43	8.30		19.3		0.0013	
182	182+187	7	7.19	6.90	0.06		35.3		576.0		0.07		0.50	0.50	8.69		17.5		0.0022	
183	183	7	7.20	6.91	0.07		15.0		228.4		0.03		0.51	0.49	4.60		9.3		0.0011	
184	184	7	6.85	6.56	0.11								0.42	0.58						
185	185	7	7.11	6.82	0.07		4.4		59.5		0.01		0.48	0.52						
186	186	7	6.69	6.40	0.13								0.37	0.63						
189	189	7	7.71	7.42	0.03								0.64	0.36						
191	191	7	7.55	7.26	0.04								0.60	0.40						
194	194	8	7.80	7.51	0.03		4.6		175.3		0.01		0.66	0.34						
195	195	8	7.56	7.27	0.04		2.9		77.6		0.00		0.60	0.40						
196	196+203	8	7.65	7.36	0.03		6.1		203.7		0.01		0.62	0.38	3.72		9.9		0.0004	

Station PW001. MIT results

Performance Reference Compounds				PW001 Sediment				PW001 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	**16100**	**8899**	**0.55**	**0.45**	16100	758	0.05	0.95	PCB 28
PCB 54	4	4.92	8.38E+04	**13500**	**4741**	**0.35**	**0.65**	13500	585	0.04	0.96	PCB 54
PCB 47	4	5.56	3.66E+05	**15100**	**9367**	**0.62**	**0.38**	15100	1602	0.11	0.89	PCB 47
PCB 97	5	6.00	1.01E+06	**17700**	**13550**	**0.77**	**0.23**	17700	5310	0.30	0.70	PCB 97
PCB 111	5	6.47	2.97E+06	22600	16545	0.73	0.27	22600	9872	0.44	0.56	PCB 111
PCB 153	6	6.63	4.30E+06	20000	15608	0.78	0.22	20000	9693	0.48	0.52	PCB 153
PCB 178	7	6.85	7.13E+06	18500	12489	0.68	0.32	18500	7878	0.43	0.57	PCB 178

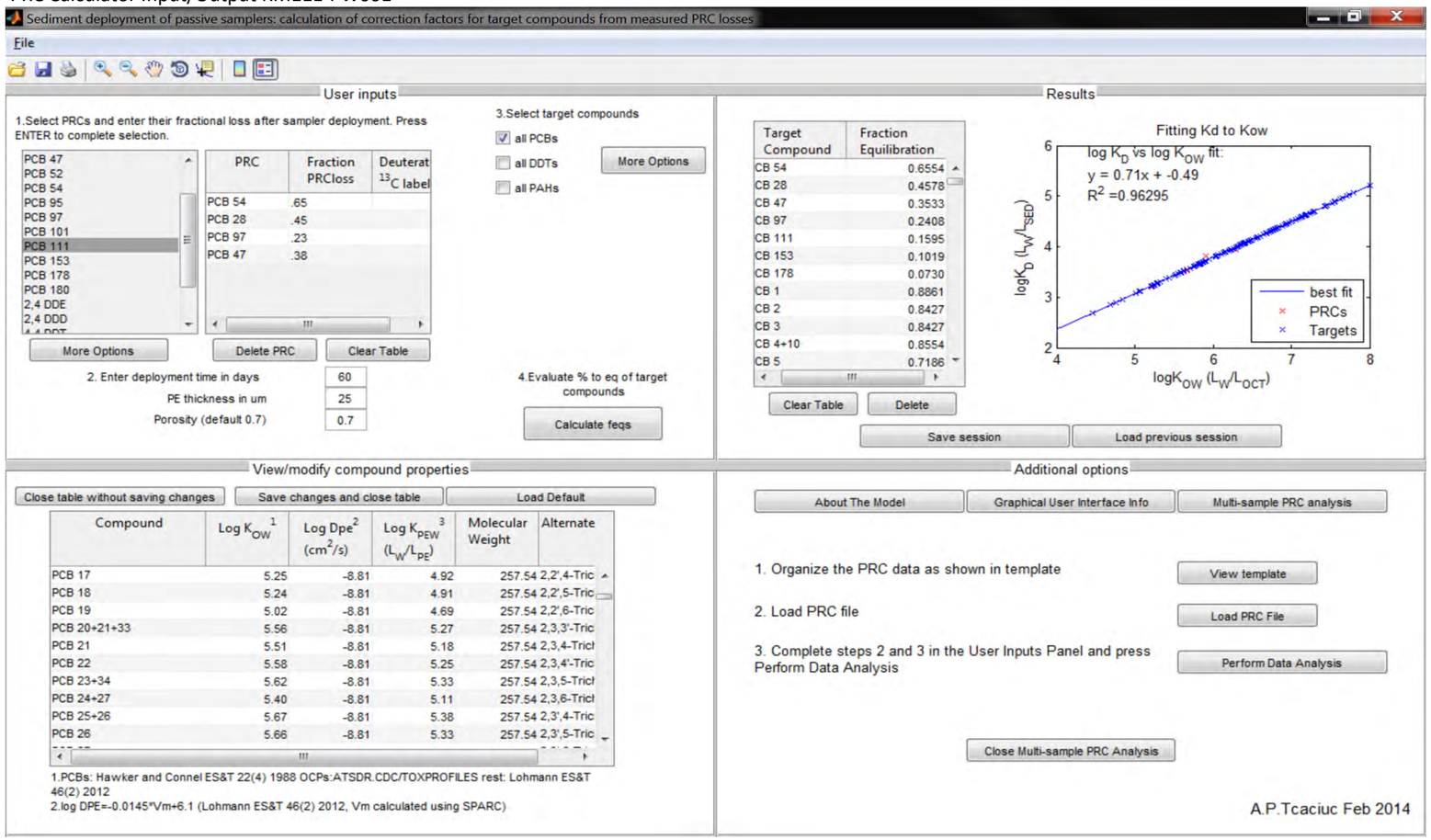


Analytes and Partitioning Coefficients					PW001 Sediment Column								PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibrium		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	from PRC Calculator				PE Concentration ÷ (1-% PRC Remaining)				=0.1128*LN(10^logKpew)-1.289 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
197	197	8	7.30	7.01	0.05								0.53	0.47						
198	198	8	7.62	7.33	0.03		4.2		122.7		0.01		0.62	0.38	2.92		7.6		0.0004	
199	199	8	7.20	6.91	0.06		5.0		80.2		0.01		0.51	0.49	2.72		5.5		0.0007	
200	200	8	7.27	6.98	0.06								0.52	0.48						
201	201	8	7.62	7.33	0.03		1.5		42.4		0.00		0.62	0.38						
202	202	8	7.24	6.95	0.06								0.52	0.48						
204	204	8	7.30	7.01	0.05								0.53	0.47						
205	205	8	8.00	7.71	0.02								0.71	0.29						
206	206	9	8.09	7.80	0.02								0.74	0.26						
207	207	9	7.74	7.45	0.03								0.65	0.35						
208	208	9	7.71	7.42	0.03								0.64	0.36						
209	209	10	8.18	7.89	0.01								0.76	0.24						
	Performance Reference Compounds						2268.23			**Sum Congeners**	18.64	ng/L							0.96	ng/L

PRCs not included in porewater calculations

PCBs 29, 38 and 129 were flagged by MIT due to interference with those values from PRCs 28 and 54. Those were then not used in the PW001 calculations.

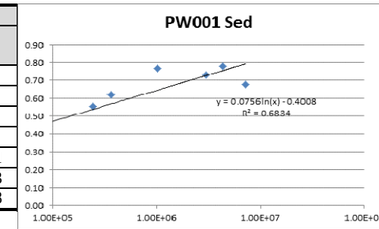
PRC Calculator Input/Output RM11E-PW001

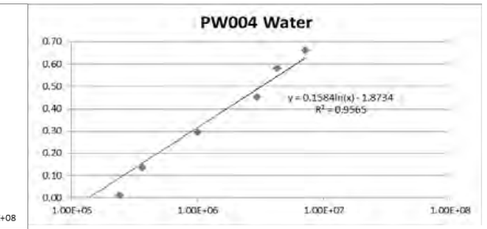


Station PW004 MIT Results

Performance Reference Compounds				PW004 Sediment				PW004 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	613	271	0.44	0.56	613	6	0.01	0.99	PCB 28
PCB 54	4	4.92	8.38E+04	548	230	0.42	0.58	548	5	0.01	0.99	PCB 54
PCB 47	4	5.56	3.66E+05	557	503	0.90	0.10	557	76	0.14	0.86	PCB 47
PCB 97	5	6.00	1.01E+06	690	402	0.58	0.42	690	203	0.29	0.71	PCB 97
PCB 111	5	6.47	2.97E+06	810	467	0.58	0.42	810	367	0.45	0.55	PCB 111
PCB 153	6	6.63	4.30E+06	776	550	0.71	0.29	776	451	0.58	0.42	PCB 153
PCB 178	7	6.85	7.13E+06	732	363	0.50	0.50	732	485	0.66	0.34	PCB 178

Bolded values used in PRC Correction Calculator



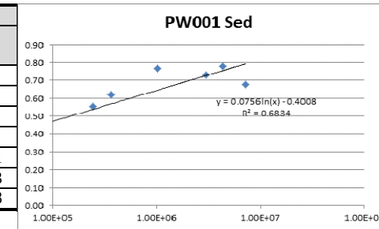


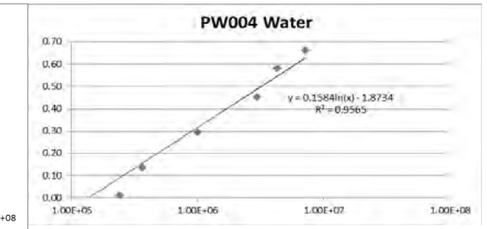
Analytes and Partitioning Coefficients					PW004 Sediment Column								PW004 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	PRC Calculator results = Regression Line Results				PE Concentration ÷ (1-% PRC Remaining)				=0.1584*LN(10^logKpew)-1.834 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
1	1	1	4.46	4.17	0.29	0.71							0.01	0.99						
2	2	1	4.69	4.40	0.32	0.68							0.01	0.99						
3	3	1	4.76	4.47	0.33	0.67							0.01	0.99						
4	4+10	2	4.65	4.36	0.32	0.68	146.5		214.0		9.28		0.01	0.99	35.39		35.7		0.66	
5	5+8	2	5.02	4.74	0.37	0.63	16.2		25.8		0.47		0.01	0.99	0.28		0.3		0.00	
6	6	2	5.06	4.77	0.38	0.62	5.4		8.7		0.15		0.01	0.99	0.07		0.1		0.00	
7	7+9	2	5.07	4.78	0.38	0.62	3.8		6.2		0.10		0.01	0.99	0.22		0.2		0.00	
11	11	2	5.28	4.99	0.41	0.59							0.01	0.99	1.07		1.1		0.01	
12	12	2	5.22	4.93	0.40	0.60	32.0		53.6		0.63		0.01	0.99						
13	13	2	5.29	5.00	0.41	0.59							0.01	0.99						
14	14	2	5.28	4.99	0.41	0.59							0.01	0.99	0.53		0.5		0.01	
15	15	2	5.30	5.01	0.41	0.59	12.8		21.8		0.21		0.01	0.99	0.00		0.0		0.00	
16	16+32	3	5.32	5.04	0.42	0.58	78.0		133.9		1.24		0.01	0.99	2.00		2.0		0.02	
17	17	3	5.25	4.96	0.41	0.59	121.6		204.8		2.23		0.01	0.99	2.86		2.9		0.032	
18	18	3	5.24	4.95	0.40	0.60	24.2		40.6		0.45		0.01	0.99	0.59		0.6		0.01	
19	19	3	5.02	4.73	0.37	0.63	350.3		557.4		10.31		-0.15	1.15	5.24		4.6		0.02	
20	20+21+33	3	5.56	5.27	0.45	0.55	16.9		31.0		0.16		0.05	0.95						
22	22	3	5.58	5.29	0.46	0.54	1.8		3.3		0.02		0.06	0.94						
23	23 + 34	3	5.62	5.33	0.46	0.54							0.07	0.93						
24	24+27	3	5.40	5.11	0.43	0.57	35.9		62.9		0.49		-0.01	1.01	1.00		1.0		0.00	
25	25+26	3	5.67	5.38	0.47	0.53	7.9		14.9		0.06		0.09	0.91	0.40		0.4		0.00	
28	**28**+31	3	5.67	5.38	0.47	0.53							0.09	0.91						
29	29	3	5.60	5.31	0.46	0.54	9.5		17.6		0.09		0.06	0.94						
30	30	3	5.44	5.15	0.44	0.56	1.8		3.3		0.02		0.01	0.99						
35	35	3	5.82	5.53	0.49	0.51							0.14	0.86						
36	36	3	5.88	5.59	0.50	0.50							0.17	0.83	0.64		0.8		0.00	
37	37	3	5.83	5.54	0.49	0.51	1.7		3.4		0.01		0.15	0.85	0.00		0.0		0.00	
38	38	3	5.76	5.47	0.48	0.52	27.6		53.5		0.18		0.12	0.88	3.46		3.9		0.02	
40	40	4	5.66	5.37	0.47	0.53	3.0		5.6		0.02		0.09	0.91	0.18		0.2		0.00	
41	41+64+68	4	6.03	5.74	0.52	0.48	8.8		18.4		0.03		0.22	0.78	1.26		1.6		0.01	
42	42	4	5.76	5.47	0.48	0.52	8.6		16.6		0.06		0.12	0.88	0.68		0.8		0.00	
43	43	4	5.75	5.46	0.48	0.52							0.12	0.88						
44	44	4	5.75	5.46	0.48	0.52	20.1		38.8		0.13		0.12	0.88	1.68		1.9		0.01	
45	45	4	5.53	5.24	0.45	0.55	2.5		4.5		0.03		0.04	0.96						
46	46	4	5.53	5.24	0.45	0.55	11.7		21.2		0.12		0.04	0.96	0.39		0.4		0.00	
47	**47**+48+75	4	5.91	5.62	0.51	0.49							0.18	0.82						
49	49	4	5.85	5.56	0.50	0.50	155.3		309.0		0.85		0.16	0.84	12.53		14.8		0.067	
50	50	4	5.63	5.34	0.46	0.54	11.5		21.5		0.10		0.08	0.92	1.00		1.1		0.00	
51	51	4	5.63	5.34	0.46	0.54	170.0		317.1		1.44		0.08	0.92	9.20		10.0		0.028	
52	52	4	5.84	5.55	0.50	0.50	143.6		284.8		0.80		0.15	0.85	10.89		12.8		0.060	
53	53	4	5.62	5.33	0.46	0.54	189.2		351.9		1.63		0.07	0.93	7.49		8.1		0.096	
54	54	4	5.21	4.92	0.40	0.60							-0.08	1.08						
56	56+60	4	6.11	5.82	0.54	0.46	4.6		9.9		0.01		0.25	0.75	0.60		0.8		0.00	
57	57	4	6.17	5.88	0.55	0.45	0.6		1.4		0.00		0.27	0.73	0.16		0.2		0.00	
58	58	4	6.17	5.88	0.55	0.45							0.27	0.73						
59	59	4	5.95	5.66	0.51	0.49							0.19	0.81						
61	61	4	6.04	5.75	0.53	0.47							0.22	0.78						
62	62	4	5.89	5.60	0.50	0.50							0.17	0.83						
63	63	4	6.17	5.88	0.55	0.45	1.3		2.9		0.00		0.27	0.73	0.48		0.7		0.00	

Station PW004 MIT Results

Performance Reference Compounds				PW004 Sediment				PW004 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	613	271	0.44	0.56	613	6	0.01	0.99	PCB 28
PCB 54	4	4.92	8.38E+04	548	230	0.42	0.58	548	5	0.01	0.99	PCB 54
PCB 47	4	5.56	3.66E+05	557	503	0.90	0.10	557	76	0.14	0.86	PCB 47
PCB 97	5	6.00	1.01E+06	690	402	0.58	0.42	690	203	0.29	0.71	PCB 97
PCB 111	5	6.47	2.97E+06	810	467	0.58	0.42	810	367	0.45	0.55	PCB 111
PCB 153	6	6.63	4.30E+06	776	550	0.71	0.29	776	451	0.58	0.42	PCB 153
PCB 178	7	6.85	7.13E+06	732	363	0.50	0.50	732	485	0.66	0.34	PCB 178

Bolded values used in PRC Correction Calculator



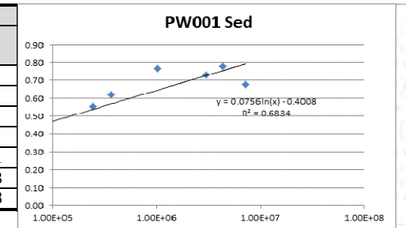


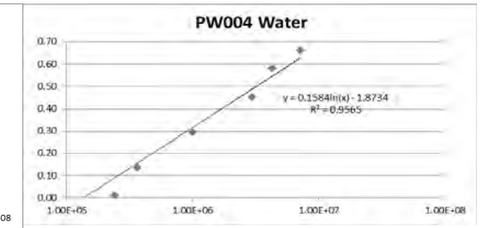
Analytes and Partitioning Coefficients					PW004 Sediment Column								PW004 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	PRC Calculator results = Regression Line Results				PE Concentration ÷ (1-% PRC Remaining)				=0.1584*LN(10^logKpew)-1.834 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
65	65	4	5.86	5.57	0.50	0.50							0.16	0.84						
66	66+80	4	6.36	6.08	0.57	0.43	9.5		22.3		0.02		0.34	0.66	2.24		3.4		0.00	
67	67	4	6.20	5.91	0.55	0.45	0.5		1.0		0.00		0.28	0.72	0.11		0.2		0.00	
69	69	4	6.04	5.75	0.53	0.47	14.0		29.6		0.05		0.22	0.78						
70	70	4	6.20	5.91	0.55	0.45	12.6		28.1		0.03		0.28	0.72	1.85		2.6		0.00	
71	71+72	4	6.14	5.86	0.54	0.46	28.6		62.5		0.09		0.26	0.74	2.21		3.0		0.01	
73	73	4	6.04	5.75	0.53	0.47							0.22	0.78	0.97		1.3		0.00	
74	74	4	6.20	5.91	0.55	0.45	3.1		6.8		0.01		0.28	0.72	0.80		1.1		0.00	
76	76	4	6.13	5.84	0.54	0.46	0.5		1.1		0.00		0.26	0.74						
77	77	4	6.36	6.07	0.57	0.43	0.4		0.9		0.00		0.34	0.66	0.17		0.3		0.00	
78	78	4	6.35	6.06	0.57	0.43							0.34	0.66						
79	79	4	6.42	6.13	0.58	0.42							0.36	0.64						
81	81	4	6.36	6.07	0.57	0.43	0.4		1.0		0.00		0.34	0.66	0.73		1.1		0.00	
82	82	5	6.20	5.91	0.55	0.45	7.5		16.7		0.02		0.28	0.72	1.26		1.8		0.00	
83	83+109	5	6.38	6.10	0.58	0.42	1.6		3.8		0.00		0.35	0.65	0.33		0.5		0.00	
84	84	5	6.04	5.75	0.53	0.47	15.2		32.1		0.06		0.22	0.78	1.66		2.1		0.00	
85	85+120	5	6.61	6.32	0.61	0.39	2.5		6.6		0.00		0.43	0.57	1.07		1.9		0.00	
86	86+**97**+125	5	6.36	6.07	0.57	0.43							0.34	0.66						
87	87+115	5	6.40	6.11	0.58	0.42							0.36	0.64						
88	88	5	6.07	5.78	0.53	0.47	22.1		47.1		0.08		0.24	0.76						
89	89+90+101	5	6.29	6.00	0.56	0.44	166.2		381.4		0.38		0.32	0.68	20.20		29.6		0.042	
91	91	5	6.13	5.84	0.54	0.46	55.6		120.7		0.17		0.26	0.74	7.85		10.6		0.009	
92	92	5	6.35	6.06	0.57	0.43	26.5		62.2		0.05		0.34	0.66	4.20		6.3		0.01	
93	93	5	6.04	5.75	0.53	0.47							0.22	0.78						
94	94	5	6.13	5.84	0.54	0.46	12.0		26.1		0.04		0.26	0.74	1.52		2.0		0.00	
95	95+121	5	6.46	6.17	0.59	0.41	161.3		392.7		0.27		0.38	0.62	14.28		22.9		0.086	
96	96	5	5.71	5.42	0.48	0.52	14.8		28.2		0.11		0.10	0.90	1.20		1.3		0.00	
98	98+102	5	6.15	5.86	0.54	0.46	12.5		27.2		0.04		0.26	0.74	1.65		2.2		0.00	
99	99	5	6.39	6.10	0.58	0.42	28.9		68.7		0.05		0.35	0.65	6.63		10.2		0.012	
100	100	5	6.23	5.94	0.55	0.45	32.6		73.4		0.08		0.29	0.71	5.40		7.7		0.009	
103	103	5	6.22	5.93	0.55	0.45	14.3		32.0		0.04		0.29	0.71	3.31		4.7		0.00	
105	105	5	6.65	6.36	0.62	0.38	4.2		11.0		0.00		0.45	0.55	1.22		2.2		0.00	
106	106+118	5	6.69	6.41	0.63	0.37	21.5		57.2		0.02		0.46	0.54	5.68		10.6		0.004	
107	107+108+123	5	6.72	6.43	0.63	0.37	8.9		23.9		0.01		0.47	0.53	1.58		3.0		0.00	
110	110	5	6.48	6.19	0.59	0.41	74.8		183.8		0.12		0.39	0.61	9.50		15.5		0.008	
111	**111**+116+117	5	6.56	6.27	0.60	0.40							0.41	0.59						
112	112	5	6.48	6.19	0.59	0.41							0.39	0.61						
113	113	5	6.54	6.25	0.60	0.40							0.41	0.59						
114	114	5	6.65	6.36	0.62	0.38							0.45	0.55						
119	119	5	6.58	6.29	0.61	0.39	9.9		25.2		0.01		0.42	0.58	2.10		3.6		0.00	
122	122	5	6.64	6.35	0.62	0.38	3.9		10.3		0.00		0.44	0.56	7.52		13.5		0.00	
124	124	5	6.73	6.44	0.63	0.37	0.6		1.7		0.00		0.48	0.52						
126	126	5	6.89	6.60	0.65	0.35							0.53	0.47						
127	127	5	6.95	6.66	0.66	0.34							0.56	0.44						
128	128	6	6.74	6.45	0.63	0.37	8.0		21.7		0.01		0.48	0.52	1.27		2.4		0.00	
129	129	6	6.73	6.44	0.63	0.37	31.3		84.8		0.03		0.48	0.52	40.91		78.2		0.02	
130	130	6	6.80	6.51	0.64	0.36	4.0		11.2		0.00		0.50	0.50	0.75		1.5		0.00	
131	131	6	6.58	6.29	0.61	0.39	1.0		2.6		0.00		0.42	0.58						
132	132+**153**	6	6.78	6.50	0.64	0.36							0.50	0.50						

Station PW004 MIT Results

Performance Reference Compounds				PW004 Sediment				PW004 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	613	271	0.44	0.56	613	6	0.01	0.99	PCB 28
PCB 54	4	4.92	8.38E+04	548	230	0.42	0.58	548	5	0.01	0.99	PCB 54
PCB 47	4	5.56	3.66E+05	557	503	0.90	0.10	557	76	0.14	0.86	PCB 47
PCB 97	5	6.00	1.01E+06	690	402	0.58	0.42	690	203	0.29	0.71	PCB 97
PCB 111	5	6.47	2.97E+06	810	467	0.58	0.42	810	367	0.45	0.55	PCB 111
PCB 153	6	6.63	4.30E+06	776	550	0.71	0.29	776	451	0.58	0.42	PCB 153
PCB 178	7	6.85	7.13E+06	732	363	0.50	0.50	732	485	0.66	0.34	PCB 178

Bolded values used in PRC Correction Calculator



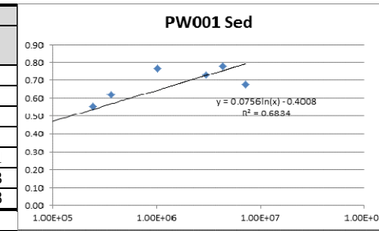


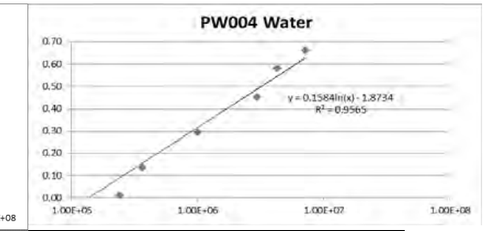
Analytes and Partitioning Coefficients					PW004 Sediment Column								PW004 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	PRC Calculator results = Regression Line Results				PE Concentration ÷ (1-% PRC Remaining)				=0.1584*LN(10^logKpew)-1.834 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
133	133 + 165	6	6.97	6.68	0.67	0.33	0.9		2.7		0.00		0.56	0.44	0.26		0.6		0.00	
134	134+143	6	6.58	6.29	0.61	0.39	8.9		22.5		0.01		0.42	0.58	1.34		2.3		0.00	
135	135	6	6.64	6.35	0.62	0.38	30.5		79.5		0.04		0.44	0.56	5.01		9.0		0.01	
136	136	6	6.22	5.93	0.55	0.45	49.0		109.8		0.13		0.29	0.71	6.32		8.9		0.00	
137	137	6	6.83	6.54	0.65	0.35	1.1		3.0		0.00		0.51	0.49	0.30		0.6		0.00	
138	138+160	6	6.88	6.60	0.65	0.35	72.6		209.9		0.05		0.53	0.47	10.14		21.7		0.01	
139	139+149	6	6.67	6.38	0.62	0.38	177.9		470.1		0.19		0.45	0.55	22.46		41.2		0.02	
140	140	6	6.67	6.38	0.62	0.38	1.0		2.6		0.00		0.45	0.55	0.25		0.5		0.00	
141	141	6	6.82	6.53	0.64	0.36	37.0		104.1		0.03		0.51	0.49	4.71		9.6		0.01	
142	142	6	6.51	6.22	0.60	0.40	4.1		10.3		0.01		0.40	0.60	1.51		2.5		0.00	
144	144	6	6.67	6.38	0.62	0.38	10.8		28.6		0.01		0.45	0.55	1.45		2.7		0.00	
145	145	6	6.25	5.96	0.56	0.44							0.30	0.70						
146	146+161	6	7.00	6.71	0.67	0.33	20.3		61.6		1.21E-02		0.57	0.43	3.73		8.7		0.004	
147	147	6	6.64	6.35	0.62	0.38	14.1		36.8		1.63E-02		0.44	0.56	2.36		4.3		0.00	
148	148	6	6.73	6.44	0.63	0.37	1.9		5.1		1.85E-03		0.48	0.52	0.60		1.1		0.00	
151	151	6	6.64	6.35	0.62	0.38	71.4		186.5		8.27E-02		0.44	0.56	9.99		18.0		0.021	
152	152	6	6.22	5.93	0.55	0.45	1.8		3.9		4.60E-03		0.29	0.71	0.32		0.5		0.00	
154	154	6	6.76	6.47	0.64	0.36	4.6		12.5		4.22E-03		0.49	0.51	0.98		1.9		0.00	
155	155	6	6.41	6.12	0.58	0.42	0.5		1.1		8.37E-04		0.36	0.64	0.21		0.3		0.00	
156	156	6	7.18	6.89	0.70	0.30	5.4		17.9		2.29E-03		0.64	0.36	0.82		2.3		0.00	
157	157	6	7.18	6.89	0.70	0.30							0.64	0.36						
158	158	6	7.02	6.73	0.67	0.33	9.9		30.5		5.64E-03		0.58	0.42	1.35		3.2		0.00	
159	159	6	7.24	6.95	0.71	0.29							0.66	0.34						
162	162	6	7.24	6.95	0.71	0.29							0.66	0.34						
163	163+164	6	7.01	6.72	0.67	0.33	52.2		159.2		3.05E-02		0.58	0.42	7.88		18.6		0.004	
166	166	6	6.93	6.64	0.66	0.34							0.55	0.45						
167	167	6	7.27	6.98	0.71	0.29	2.1		7.3		7.57E-04		0.67	0.33	0.41		1.3		0.00	
168	168	6	7.11	6.82	0.69	0.31	40.0		128.2		1.93E-02		0.62	0.38						
169	169	6	7.42	7.13	0.74	0.26							0.73	0.27						
170	170+190	7	7.38	7.09	0.73	0.27	19.1		70.2		5.73E-03		0.71	0.29	3.36		11.7		0.00	
171	171	7	7.11	6.82	0.69	0.31	7.7		24.6		3.70E-03		0.62	0.38	1.01		2.6		0.00	
172	172+192	7	7.44	7.15	0.74	0.26	4.2		15.9		1.13E-03		0.73	0.27	0.66		2.5		0.00	
173	173	7	7.02	6.73	0.67	0.33	0.8		2.6		4.72E-04		0.58	0.42						
174	174+181	7	7.11	6.82	0.69	0.31	33.0		105.9		1.59E-02		0.62	0.38	4.41		11.5		0.001	
175	175	7	7.17	6.88	0.70	0.30	2.5		8.1		1.06E-03		0.64	0.36	1.64		4.5		0.00	
176	176	7	6.76	6.47	0.64	0.36	5.6		15.4		5.17E-03		0.49	0.51	0.63		1.2		0.00	
177	177	7	7.08	6.79	0.68	0.32	19.5		61.5		9.91E-03		0.60	0.40	2.93		7.4		0.00	
178	178	7	7.14	6.853	0.69	0.31							0.63	0.37						
179	179	7	6.73	6.44	0.63	0.37	19.9		53.8		1.94E-02		0.48	0.52	3.11		5.9		0.00	
180	180+193	7	7.45	7.16	0.74	0.26	56.9		218.4		1.51E-02		0.74	0.26	7.62		29.1		0.004	
182	182+187	7	7.19	6.90	0.70	0.30	44.5		148.2		1.87E-02		0.64	0.36	6.69		18.7		0.00	
183	183	7	7.20	6.91	0.70	0.30	18.2		61.2		7.48E-03		0.65	0.35	2.65		7.5		0.00	
184	184	7	6.85	6.56	0.65	0.35	0.1		0.4		1.02E-04		0.52	0.48	0.22		0.4		0.00	
185	185	7	7.11	6.82	0.69	0.31	4.5		14.4		2.16E-03		0.62	0.38	0.78		2.0		0.00	
186	186	7	6.69	6.40	0.62	0.38							0.46	0.54						
189	189	7	7.71	7.42	0.78	0.22	0.8		3.8		1.44E-04		0.83	0.17						
191	191	7	7.55	7.26	0.75	0.25	1.2		4.7		2.57E-04		0.78	0.22						
194	194	8	7.80	7.51	0.79	0.21	8.0		38.8		1.19E-03		0.87	0.13	1.00		7.5		0.00	
195	195	8	7.56	7.27	0.76	0.24	3.3		13.5		7.20E-04		0.78	0.22	0.65		2.9		0.00	

Station PW004 MIT Results

Performance Reference Compounds				PW004 Sediment				PW004 Water				
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	T=0 pg/g	Time Final pg/g	% Remaining	% Loss	
PCB 28	3	5.38	2.42E+05	613	271	0.44	0.56	613	6	0.01	0.99	PCB 28
PCB 54	4	4.92	8.38E+04	548	230	0.42	0.58	548	5	0.01	0.99	PCB 54
PCB 47	4	5.56	3.66E+05	557	503	0.90	0.10	557	76	0.14	0.86	PCB 47
PCB 97	5	6.00	1.01E+06	690	402	0.58	0.42	690	203	0.29	0.71	PCB 97
PCB 111	5	6.47	2.97E+06	810	467	0.58	0.42	810	367	0.45	0.55	PCB 111
PCB 153	6	6.63	4.30E+06	776	550	0.71	0.29	776	451	0.58	0.42	PCB 153
PCB 178	7	6.85	7.13E+06	732	363	0.50	0.50	732	485	0.66	0.34	PCB 178

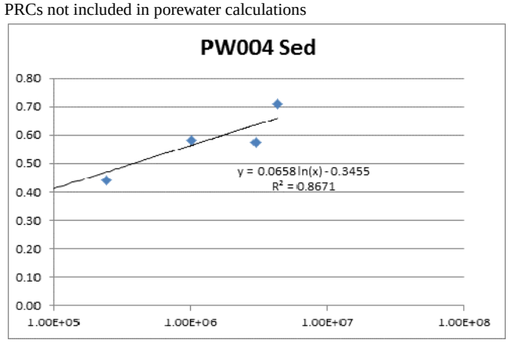
Bolded values used in PRC Correction Calculator





Analytes and Partitioning Coefficients					PW004 Sediment Column								PW004 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Homolog Group (# Cl)	log Kow	logKpew	Fractional Equilibration		PE Conc. (ng/g)		PRC Corrected (ng/g)		Porewater Conc. (ng/L)		% Remaining	Fractional Equilibrium	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
			Hawker and Connell 2008	Fernandez et al 2009	PRC Calculator results = Regression Line Results				PE Concentration ÷ (1-% PRC Remaining)				=0.1584*LN(10^logKpew)-1.834 Where value was negative, manually changed to 0				PE Concentration ÷ (1-% PRC Remaining)			
196	196+203	8	7.65	7.36	0.77	0.23	10.6		46.1		2.00E-03		0.81	0.19	1.20		6.4		0.00	
197	197	8	7.30	7.01	0.72	0.28	0.5		1.7		1.61E-04		0.68	0.32						
198	198	8	7.62	7.33	0.77	0.23	0.6		2.8		1.29E-04		0.80	0.20						
199	199	8	7.20	6.91	0.70	0.30	8.0		26.9		3.29E-03		0.65	0.35	1.33		3.8		0.00	
200	200	8	7.27	6.98	0.71	0.29	1.2		4.1		4.24E-04		0.67	0.33						
201	201	8	7.62	7.33	0.77	0.23	1.3		5.7		2.65E-04		0.80	0.20						
202	202	8	7.24	6.95	0.71	0.29	0.0		0.0		0.00E+00		0.66	0.34						
204	204	8	7.30	7.01	0.72	0.28	0.4		1.4		1.31E-04		0.68	0.32						
205	205	8	8.00	7.71	0.82	0.18	0.6		3.2		6.16E-05		0.94	0.06						
206	206	9	8.09	7.80	0.84	0.16	1.0		6.4		1.00E-04		0.97	0.03						
207	207	9	7.74	7.45	0.78	0.22	0.2		0.8		2.68E-05		0.84	0.16						
208	208	9	7.71	7.42	0.78	0.22	0.2		0.7		2.72E-05		0.95	0.05						
209	209	10	8.18	7.89	0.95	0.05							0.95	0.05						
	Performance Reference Compounds						3328.43		Sum Congeners		33.90								1.425	

PRCs not included in porewater calculations



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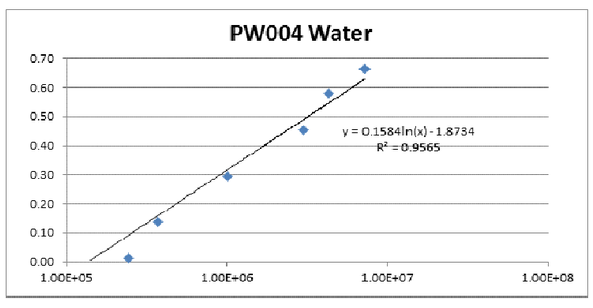
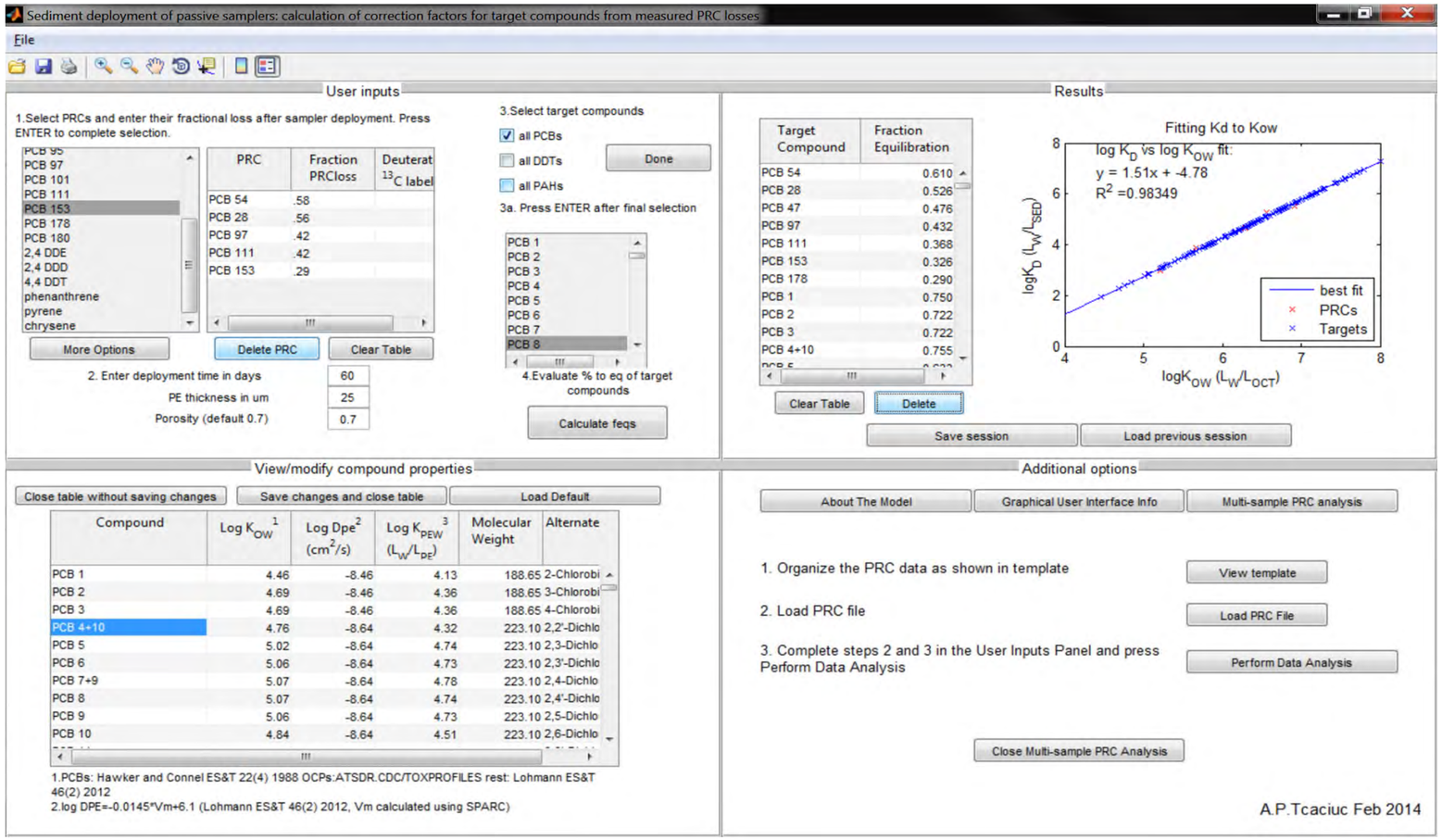


PRC Calculator Output for RM11E-PW004



Appendix L

ALS Surface Water Estimations

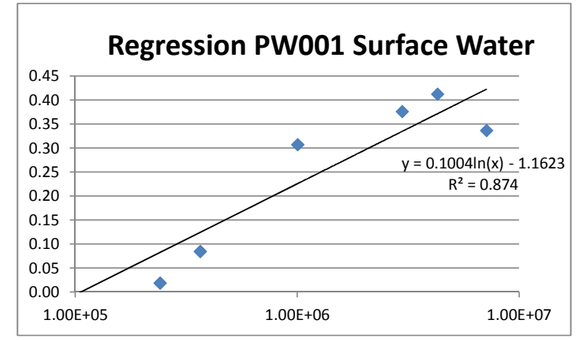
ALS PW001 Porewater Result Calculations

Performance Reference Compounds				PW001 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	19900	374	0.02	0.98
PCB 54	4	4.923	8.38E+04	23200	74	0.00	1.00
PCB 47	4	5.563	3.66E+05	25200	2120	0.08	0.92
PCB 97	5	6.003	1.01E+06	18300	5620	0.31	0.69
PCB 111	5	6.473	2.97E+06	22900	8610	0.38	0.62
PCB 153	6	6.633	4.30E+06	20200	8330	0.41	0.59
PCB 178	7	6.853	7.13E+06	17800	5990	0.34	0.66

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.00	0.09	-0.08
PCB 54	0.08	-0.02	0.10
PCB 47	0.31	0.13	0.18
PCB 97	0.38	0.23	0.15
PCB 111	0.41	0.34	0.08
PCB 153	0.34	0.37	-0.04
PCB 178	0.34	0.42	-0.09



Analytes and Partitioning Coefficients					PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
1	PCB 1	1	4.46	4.17	0.00		6.74	U				
2	PCB 2	1	4.69	4.40	0.00		10.10	U				
3	PCB 3	1	4.69	4.40	0.00		10.40	U				
4	PCB 4	2	4.65	4.36	0.00		4.04	U				
5	PCB 5	2	4.97	4.68	0.00		4.87	U				
6	PCB 6	2	5.06	4.77	0.00		4.94	U				
7	PCB 7	2	5.07	4.78	0.00		4.36	U				
8	PCB 8	2	5.07	4.78	0.07		4.34	U				
9	PCB 9	2	5.06	4.77	0.06		5.46	U				
10	PCB 10	2	4.84	4.55	0.06		3.27	U				
11	PCB 11	2	5.28	4.99	0.06		5.52	U				
12	PCBs 12 + 13	2	5.26	4.97	0.01		5.04	U				
14	PCB 14	2	5.28	4.99	0.09		4.96	U				
15	PCB 15	2	5.30	5.01	0.08		6.59	U				
16	PCB 16	3	5.16	4.87	0.03		28.20	U				
17	PCB 17	3	5.25	4.96	0.03		24.70	U				
18	PCB 18	3	5.24	4.95	0.09		16.80	U				
19	PCB 19	3	5.02	4.73	0.03		18.20	U				
20	PCBs 20 + 28	3	5.62	5.34	0.08							
21	PCBs 21 + 33	3	5.56	5.27	0.12		12.10	U				
22	PCB 22	3	5.58	5.29	0.13		14.20	U				
23	PCB 23	3	5.57	5.28	0.12		13.10	U				
24	PCB 24	3	5.35	5.06	0.11		16.20	U				
25	PCB 25	3	5.67	5.38	0.14		10.90	U				
26	PCBs 26 + 29	3	5.63	5.34	0.13		13.90	U				
27	PCB 27	3	5.44	5.15	0.09		17.60	U				
30	PCB 30	3	5.15	5.15	0.11		23.90	U				
31	PCB 31	3	5.38	5.38	0.14		13.70	U				
32	PCB 32	3	5.15	5.15	0.12		16.40	U				
34	PCB 34	3	5.37	5.37	0.07		16.20	U				
35	PCB 35	3	5.53	5.53	0.05		15.90	U				
36	PCB 36	3	5.59	5.59	0.11		13.20	U				
37	PCB 37	3	5.54	5.54	0.13		21.70	U				
38	PCB 38	3	5.47	5.47	0.07		14.80	U				
39	PCB 39	3	5.60	5.60	0.12		12.10	U				
40	PCBs 40 + 71	4	5.85	5.56	0.00		11.60	U				
41	PCB 41	4	5.40	5.40	0.19		14.80	U				
42	PCB 42	4	5.47	5.47	0.19		9.72	U				
43	PCBs 43 + 73	4	5.92	5.63	0.20		10.80	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.20							
45	PCBs 45 + 51	4	5.58	5.30	0.15		34.10	J	40.3		0.20	
46	PCB 46	4	5.53	5.24	0.19		14.10	U				
48	PCB 48	4	5.78	5.49	0.17		10.90	U				
49	PCB 49	4	5.85	5.56	0.20		34.80	J	43.5		0.12	
50	PCBs 50 + 53	4	5.63	5.34	0.15		25.00	J	29.4		0.13	
52	PCB 52	4	5.84	5.55	0.21		12.30	U				
54	PCB 54	4	5.21	4.92	0.21							
55	PCB 55	4	6.11	5.82	0.22		10.60	U				
56	PCB 56	4	6.11	5.82	0.17		14.50	U				

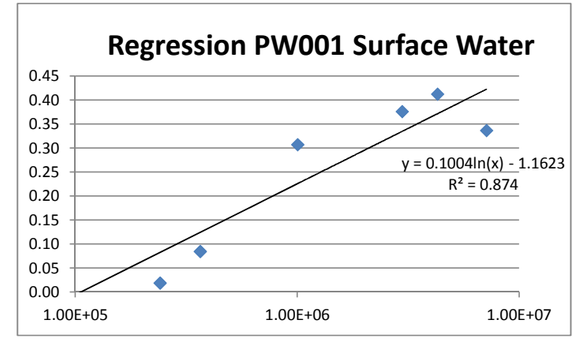
ALS PW001 Porewater Result Calculations

Performance Reference Compounds				PW001 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	19900	374	0.02	0.98
PCB 54	4	4.923	8.38E+04	23200	74	0.00	1.00
PCB 47	4	5.563	3.66E+05	25200	2120	0.08	0.92
PCB 97	5	6.003	1.01E+06	18300	5620	0.31	0.69
PCB 111	5	6.473	2.97E+06	22900	8610	0.38	0.62
PCB 153	6	6.633	4.30E+06	20200	8330	0.41	0.59
PCB 178	7	6.853	7.13E+06	17800	5990	0.34	0.66

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.00	0.09	-0.08
PCB 54	0.08	-0.02	0.10
PCB 47	0.31	0.13	0.18
PCB 97	0.38	0.23	0.15
PCB 111	0.41	0.34	0.08
PCB 153	0.34	0.37	-0.04
PCB 178	0.34	0.42	-0.09



Analytes and Partitioning Coefficients					PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
57	PCB 57	4	6.17	5.88	0.20		9.96	U				
58	PCB 58	4	6.17	5.88	0.22		9.51	U				
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.24		24.40	J	32.3		0.07	
60	PCB 60	4	6.11	5.82	0.24		13.00	U				
61	PCB 61	4	6.04	5.75	0.26		9.54	U				
62	PCB 63	4	6.17	5.88	0.27		9.56	U				
64	PCB 64	4	5.95	5.66	0.24		6.12	U				
66	PCB 66	4	6.20	5.91	0.21		10.30	U				
67	PCB 67	4	6.20	5.91	0.24		8.45	U				
68	PCB 68	4	6.26	5.97	0.17		8.52	U				
69	PCB 69	4	6.04	5.75	0.23		7.20	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.26		8.29	U				
72	PCB 72	4	6.26	5.97	0.18		9.11	U				
77	PCB 77	4	6.36	6.07	0.18		17.80	U				
78	PCB 78	4	6.35	6.06	0.26		15.20	U				
79	PCB 79	4	6.42	6.13	0.19		160.00		197.8		0.15	
80	PCB 80	4	6.48	6.19	0.24		11.80	U				
81	PCB 81	4	6.36	6.07	0.17		16.20	U				
82	PCB 82	5	6.20	5.91	0.19		33.40	U				
83	PCBs 83 + 99	5	6.33	6.04	0.20		21.50	U				
84	PCB 84	5	6.04	5.75	0.09		22.00	U				
85	PCB 85	5	6.30	6.01	0.19		21.60	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.21							
88	PCB 88	5	6.07	5.78	0.12		19.50	U				
89	PCB 89	5	6.07	5.78	0.31		28.20	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.31		34.60	J	50.0		0.04	
91	PCB 91	5	6.13	5.84	0.32		15.70	U				
92	PCB 92	5	6.35	6.06	0.33		22.10	U				
93	PCB 93	5	6.04	5.75	0.27		19.30	U				
94	PCB 94	5	6.13	5.84	0.34		18.40	U				
95	PCBs 95 + 100	5	6.18	5.90	0.26		48.80	J	66.4		0.08	
96	PCB 96	5	5.71	5.42	0.31		13.50	U				
98	PCBs 98 + 102	5	6.15	5.86	0.25		16.00	U				
103	PCB 103	5	6.22	5.93	0.33		16.00	U				
104	PCB 104	5	5.81	5.52	0.34		12.70	U				
105	PCB 105	5	6.65	6.36	0.31		20.60	U				
106	PCB 106	5	6.64	6.35	0.31		18.40	U				
107	PCB 107	5	6.71	6.42	0.33		19.40	U				
108	PCBs 108 + 124	5	6.72	6.43	0.37		17.90	U				
110	PCBs 110 + 115	5	6.49	6.20	0.38		13.10	U				
111	PCB 111	5	6.76	6.473	0.33							
112	PCB 112	5	6.45	6.16	0.36		15.50	U				
114	PCB 114	5	6.65	6.36	0.34		20.40	U				
117	PCBs 116 + 117	5	6.40	6.11	0.29		16.10	U				
118	PCB 118	5	6.74	6.45	0.29		21.00	U				
120	PCB 120	5	6.79	6.50	0.36		15.40	U				
121	PCB 121	5	6.64	6.35	0.29		13.00	U				
122	PCB 122	5	6.64	6.35	0.32		20.90	U				

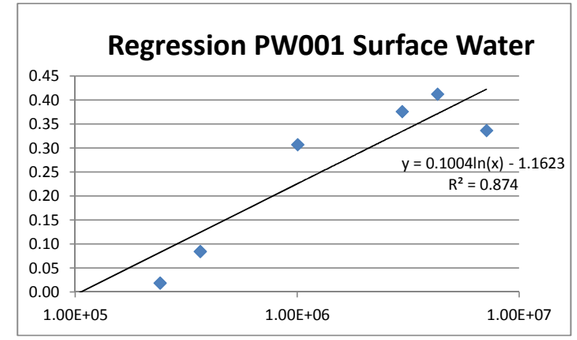
ALS PW001 Porewater Result Calculations

Performance Reference Compounds				PW001 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	19900	374	0.02	0.98
PCB 54	4	4.923	8.38E+04	23200	74	0.00	1.00
PCB 47	4	5.563	3.66E+05	25200	2120	0.08	0.92
PCB 97	5	6.003	1.01E+06	18300	5620	0.31	0.69
PCB 111	5	6.473	2.97E+06	22900	8610	0.38	0.62
PCB 153	6	6.633	4.30E+06	20200	8330	0.41	0.59
PCB 178	7	6.853	7.13E+06	17800	5990	0.34	0.66

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.00	0.09	-0.08
PCB 54	0.08	-0.02	0.10
PCB 47	0.31	0.13	0.18
PCB 97	0.38	0.23	0.15
PCB 111	0.41	0.34	0.08
PCB 153	0.34	0.37	-0.04
PCB 178	0.34	0.42	-0.09



Analytes and Partitioning Coefficients					PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
123	PCB 123	5	6.74	6.45	0.21		19.80	U				
126	PCB 126	5	6.89	6.60	0.35		20.00	U				
127	PCB 127	5	6.95	6.66	0.32		22.50	U				
128	PCB 128	6	6.74	6.45	0.35		16.10	U				
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.28		57.60	J	79.8		0.02	
130	PCB 130	6	6.80	6.51	0.30		18.20	U				
131	PCB 131	6	6.58	6.29	0.32		14.00	U				
132	PCB 132	6	6.58	6.29	0.22		16.30	U				
133	PCB 133	6	6.86	6.57	0.37		17.40	U				
134	PCB 134	6	6.55	6.26	0.31		13.10	U				
135	PCBs 135 + 154	6	6.70	6.42	0.33		13.10	U				
136	PCB 136	6	6.22	5.93	0.23		11.00	U				
137	PCB 137	6	6.83	6.54	0.31		14.80	U				
139	PCBs 139 + 140	6	6.67	6.38	0.21		14.20	U				
141	PCB 141	6	6.82	6.53	0.40		15.70	U				
142	PCB 142	6	6.51	6.22	0.26		17.80	U				
143	PCB 143	6	6.60	6.31	0.43		17.20	U				
144	PCB 144	6	6.67	6.38	0.40		14.90	U				
145	PCB 145	6	6.25	5.96	0.45		9.60	U				
146	PCB 146	6	6.89	6.60	0.37		13.40	U				
147	PCBs 147 + 149	6	6.66	6.37	0.41		41.70	J	70.6		0.03	
148	PCB 148	6	6.73	6.44	0.45		15.30	U				
150	PCB 150	6	6.32	6.03	0.40		9.95	U				
151	PCB 151	6	6.64	6.35	0.40		19.90	J	33.3		0.01	
152	PCB 152	6	6.22	5.93	0.37		11.00	U				
153	PCBs 153 + 168	6	7.03	6.74	0.45							
155	PCB 155	6	6.41	6.12	0.49		9.27	U				
156	PCBs 156 + 157	6	7.18	6.89	0.45		25.70	U				
158	PCB 158	6	7.02	6.73	0.41		257.00		433.0		0.08	
159	PCB 159	6	7.24	6.95	0.47		15.50	U				
160	PCB 160	6	6.93	6.64	0.42		7.18	U				
161	PCB 161	6	7.08	6.79	0.43		12.30	U				
162	PCB 162	6	7.24	6.95	0.34		14.60	U				
164	PCB 164	6	7.02	6.73	0.41		11.90	U				
165	PCB 165	6	7.05	6.76	0.42		11.70	U				
166	PCB 166	6	6.93	6.64	0.33		11.80	U				
167	PCB 167	6	7.27	6.98	0.49		12.10	U				
169	PCB 169	6	7.42	7.13	0.42		13.40	U				
170	PCB 170	7	7.27	6.98	0.44		24.20	U				
171	PCBs 171 + 173	7	7.07	6.78	0.44		23.00	U				
172	PCB 172	7	7.33	7.04	0.36		22.40	U				
174	PCB 174	7	7.11	6.82	0.42		19.60	U				
175	PCB 175	7	7.17	6.88	0.32		15.40	U				
176	PCB 176	7	6.76	6.47	0.43		11.10	U				
177	PCB 177	7	7.08	6.79	0.35		21.40	U				
178	PCB 178	7	7.14	6.853	0.55							
179	PCB 179	7	6.73	6.44	0.50		12.80	J	25.4		0.01	
180	PCBs 180 + 193	7	7.45	7.16	0.52		32.60	J	67.5		0.005	
181	PCB 181	7	7.11	6.82	0.51		18.40	U				

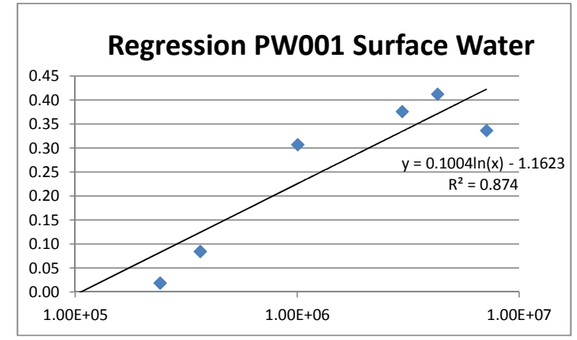
ALS PW001 Porewater Result Calculations

Performance Reference Compounds				PW001 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	19900	374	0.02	0.98
PCB 54	4	4.923	8.38E+04	23200	74	0.00	1.00
PCB 47	4	5.563	3.66E+05	25200	2120	0.08	0.92
PCB 97	5	6.003	1.01E+06	18300	5620	0.31	0.69
PCB 111	5	6.473	2.97E+06	22900	8610	0.38	0.62
PCB 153	6	6.633	4.30E+06	20200	8330	0.41	0.59
PCB 178	7	6.853	7.13E+06	17800	5990	0.34	0.66

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.00	0.09	-0.08
PCB 54	0.08	-0.02	0.10
PCB 47	0.31	0.13	0.18
PCB 97	0.38	0.23	0.15
PCB 111	0.41	0.34	0.08
PCB 153	0.34	0.37	-0.04
PCB 178	0.34	0.42	-0.09



Analytes and Partitioning Coefficients					PW001 Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
182	PCB 182	7	7.20	6.91	0.57		14.20	U				
183	PCB 183	7	7.20	6.91	0.52		20.00	U				
184	PCB 184	7	6.85	6.56	0.54		10.20	U				
185	PCB 185	7	7.11	6.82	0.46		19.60	U				
186	PCB 186	7	6.69	6.40	0.50		10.70	U				
187	PCB 187	7	7.17	6.88	0.45		19.90	J	36.4		0.005	
188	PCB 188	7	6.82	6.53	0.53		12.90	U				
189	PCB 189	7	7.71	7.42	0.45		16.10	U				
190	PCB 190	7	7.46	7.17	0.54		15.00	U				
191	PCB 191	7	7.55	7.26	0.46		17.10	U				
192	PCB 192	7	7.52	7.23	0.62		16.30	U				
194	PCB 194	8	7.80	7.51	0.64		14.20	U				
195	PCB 195	8	7.56	7.27	0.56		14.20	U				
196	PCB 196	8	7.65	7.36	0.55		13.90	U				
197	PCB 197	8	7.30	7.01	0.66		8.95	U				
198	PCBs 198 + 199	8	7.46	7.17	0.99		13.3	U				
200	PCB 200	8	7.27	6.98	0.99		9.76	U				
201	PCB 201	8	7.62	7.33	0.99		9.52	U				
202	PCB 202	8	7.24	6.95	0.99		10.3	U				
203	PCB 203	8	7.65	7.36	0.99		11.9	U				
204	PCB 204	8	7.30	7.01	0.99		9.55	U				
205	PCB 205	8	8.00	7.71	0.99		11.8	U				
206	PCB 206	9	8.09	7.80	0.99		23.6	U				
207	PCB 207	9	7.74	7.45	0.99		12	U				
208	PCB 208	9	7.71	7.42	0.99		11	U				
209	PCB 209	10	8.18	7.89	0.99		17	U				
										Sum		**0.96**

Performance Reference Compounds

PRCs not included in porewater calculations

Note: If the percent lost > = 1.0, substituted 0.99 to fit the equation

PW002 Porewater Calculations. ALS Data

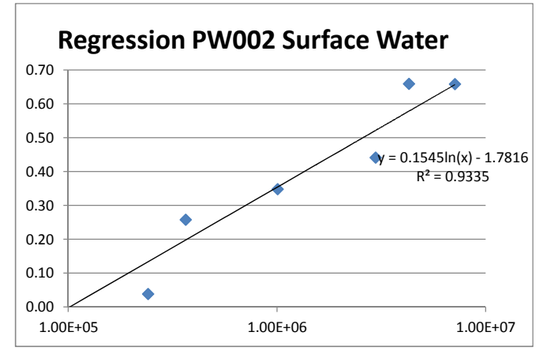
Low Load PRCs

Performance Reference Compounds				PW002 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	717	27	0.04	0.96
PCB 54	4	4.923	8.38E+04	660	9	0.01	0.99
PCB 47	4	5.563	3.66E+05	564	145	0.26	0.74
PCB 97	5	6.003	1.01E+06	890	309	0.35	0.65
PCB 111	5	6.473	2.97E+06	1190	524	0.44	0.56
PCB 153	6	6.633	4.30E+06	1210	797	0.66	0.34
PCB 178	7	6.853	7.13E+06	1210	796	0.66	0.34

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 30% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.09	-0.07
PCB 54	0.26	-0.02	0.28
PCB 47	0.35	0.13	0.22
PCB 97	0.44	0.23	0.21
PCB 111	0.66	0.34	0.32
PCB 153	0.66	0.37	0.29
PCB 178	0.66	0.42	0.23



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
1	PCB 1	1	4.46	4.17	0.00	0.33	U				
2	PCB 2	1	4.69	4.40	0.00	0.41	U				
3	PCB 3	1	4.69	4.40	0.00	0.43	U				
4	PCB 4	2	4.65	4.36	0.00	1.48	J	1.5		0.06	
5	PCB 5	2	4.97	4.68	0.00	0.16	U				
6	PCB 6	2	5.06	4.77	0.00	0.15	U				
7	PCB 7	2	5.07	4.78	0.00	0.14	U				
8	PCB 8	2	5.07	4.78	0.00	0.14	U				
9	PCB 9	2	5.06	4.77	0.00	0.16	U				
10	PCB 10	2	4.84	4.55	0.00	0.15	U				
11	PCB 11	2	5.28	4.99	0.00	0.91	J	0.9		0.01	
12	PCBs 12 + 13	2	5.26	4.97	0.00	0.15	U				
14	PCB 14	2	5.28	4.99	0.00	0.16	U				
15	PCB 15	2	5.30	5.01	0.00	0.18	U				
16	PCB 16	3	5.16	4.87	0.00	0.73	U				
17	PCB 17	3	5.25	4.96	0.00	2.25	J	2.3		0.02	
18	PCB 18	3	5.24	4.95	0.00	0.46	U				
19	PCB 19	3	5.02	4.73	0.00	5.37	J	5.4		0.10	
20	PCBs 20 + 28	3	5.62	5.34	0.12					0.00	
21	PCBs 21 + 33	3	5.56	5.27	0.09	0.61	U				
22	PCB 22	3	5.58	5.29	0.10	0.70	U				
23	PCB 23	3	5.57	5.28	0.10	0.65	U				
24	PCB 24	3	5.35	5.06	0.02	0.41	U				
25	PCB 25	3	5.67	5.38	0.13	0.51	U				
26	PCBs 26 + 29	3	5.63	5.34	0.12	0.70	U				
27	PCB 27	3	5.44	5.15	0.05	0.77	J	0.8		0.01	
30	PCB 30	3	5.15	5.15	0.05	0.83	J	0.9		0.01	
31	PCB 31	3	5.38	5.38	0.13	0.79	J	0.9		0.00	
32	PCB 32	3	5.15	5.15	0.05	1.40	J	1.5		0.01	
34	PCB 34	3	5.37	5.37	0.13	0.76	U				
35	PCB 35	3	5.53	5.53	0.19	0.72	U				
36	PCB 36	3	5.59	5.59	0.21	0.65	U				
37	PCB 37	3	5.54	5.54	0.19	0.92	U				
38	PCB 38	3	5.47	5.47	0.17	0.74	U				
39	PCB 39	3	5.60	5.60	0.21	0.61	U				
40	PCBs 40 + 71	4	5.85	5.56	0.20	4.05	J	5.0		0.01	
41	PCB 41	4	5.40	5.40	0.14	0.62	U				
42	PCB 42	4	5.47	5.47	0.17	0.66	J	0.8		0.00	
43	PCBs 43 + 73	4	5.92	5.63	0.22	0.44	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.19					0.00	
45	PCBs 45 + 51	4	5.58	5.30	0.10	15.10		16.8		0.09	
46	PCB 46	4	5.53	5.24	0.08	0.61	U				
48	PCB 48	4	5.78	5.49	0.17	0.46	U				
49	PCB 49	4	5.85	5.56	0.20	22.30		27.8		0.08	
50	PCBs 50 + 53	4	5.63	5.34	0.12	12.20		13.8		0.06	
52	PCB 52	4	5.84	5.55	0.19	21.30		26.4		0.07	
54	PCB 54	4	5.21	4.92	0.00					0.00	
55	PCB 55	4	6.11	5.82	0.29	0.41	U				
56	PCB 56	4	6.11	5.82	0.29	0.80	J	1.1		0.00	
57	PCB 57	4	6.17	5.88	0.31	0.41	U				
58	PCB 58	4	6.17	5.88	0.31	1.04	J	1.5		0.002	
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.24	2.21	J	2.9		0.01	
60	PCB 60	4	6.11	5.82	0.29	0.40	U				
61	PCB 61	4	6.04	5.75	0.27	0.38	U				
62	PCB 63	4	6.17	5.88	0.31	0.37	U				

PW002 Porewater Calculations. ALS Data

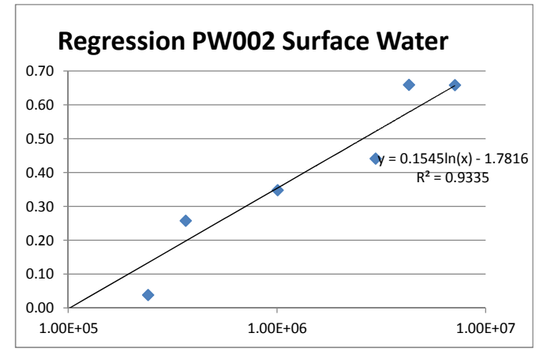
Low Load PRCs

Performance Reference Compounds				PW002 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	717	27	0.04	0.96
PCB 54	4	4.923	8.38E+04	660	9	0.01	0.99
PCB 47	4	5.563	3.66E+05	564	145	0.26	0.74
PCB 97	5	6.003	1.01E+06	890	309	0.35	0.65
PCB 111	5	6.473	2.97E+06	1190	524	0.44	0.56
PCB 153	6	6.633	4.30E+06	1210	797	0.66	0.34
PCB 178	7	6.853	7.13E+06	1210	796	0.66	0.34

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 30% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.09	-0.07
PCB 54	0.26	-0.02	0.28
PCB 47	0.35	0.13	0.22
PCB 97	0.44	0.23	0.21
PCB 111	0.66	0.34	0.32
PCB 153	0.66	0.37	0.29
PCB 178	0.66	0.42	0.23



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
64	PCB 64	4	5.95	5.66	0.23	0.73	J	1.0		0.002	
66	PCB 66	4	6.20	5.91	0.32	2.81	J	4.1		0.01	
67	PCB 67	4	6.20	5.91	0.32	0.35	U				
68	PCB 68	4	6.26	5.97	0.34	0.46	J	0.7		0.001	
69	PCB 69	4	6.04	5.75	0.27	0.30	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.31	3.73	J	5.4		0.01	
72	PCB 72	4	6.26	5.97	0.34	0.37	U				
77	PCB 77	4	6.36	6.07	0.38	0.51	U				
78	PCB 78	4	6.35	6.06	0.38	0.43	U				
79	PCB 79	4	6.42	6.13	0.40	6.56		10.9		0.01	
80	PCB 80	4	6.48	6.19	0.42	0.36	U				
81	PCB 81	4	6.36	6.07	0.38	0.52	U				
82	PCB 82	5	6.20	5.91	0.32	2.15	U				
83	PCBs 83 + 99	5	6.33	6.04	0.37	10.50	J	16.6		0.02	
84	PCB 84	5	6.04	5.75	0.27	3.35	J	4.6		0.01	
85	PCB 85	5	6.30	6.01	0.36	1.02	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.40						
88	PCB 88	5	6.07	5.78	0.28	0.79	U				
89	PCB 89	5	6.07	5.78	0.28	1.38	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.41	41.90		70.5		0.05	
91	PCB 91	5	6.13	5.84	0.30	11.00		15.6		0.02	
92	PCB 92	5	6.35	6.06	0.38	7.33		11.7		0.01	
93	PCB 93	5	6.04	5.75	0.27	0.84	U				
94	PCB 94	5	6.13	5.84	0.30	2.18	J	3.1		0.004	
95	PCBs 95 + 100	5	6.18	5.90	0.32	40.00		58.5		0.07	
96	PCB 96	5	5.71	5.42	0.15	1.82	J	2.1		0.01	
98	PCBs 98 + 102	5	6.15	5.86	0.30	2.11	J	3.0		0.00	
103	PCB 103	5	6.22	5.93	0.33	4.19	J	6.2		0.01	
104	PCB 104	5	5.81	5.52	0.18	0.95	J	1.2		0.003	
105	PCB 105	5	6.65	6.36	0.48	1.87	J	3.6		0.002	
106	PCB 106	5	6.64	6.35	0.48	1.26	U				
107	PCB 107	5	6.71	6.42	0.50	1.11	U				
108	PCBs 108 + 124	5	6.72	6.43	0.51	1.17	U				
110	PCBs 110 + 115	5	6.49	6.20	0.42	14.60		25.3		0.02	
111	PCB 111	5	6.76	6.473	0.52						
112	PCB 112	5	6.45	6.16	0.41	0.69	U				
114	PCB 114	5	6.65	6.36	0.48	1.32	U				
117	PCBs 117 + 116	5	6.40	6.11	0.39	0.73	U				
118	PCB 118	5	6.74	6.45	0.51	9.04		18.6		0.01	
120	PCB 120	5	6.79	6.50	0.53	0.65	U				
121	PCB 121	5	6.64	6.35	0.48	0.58	U				
122	PCB 122	5	6.64	6.35	0.48	1.37	U				
123	PCB 123	5	6.74	6.45	0.51	1.33	U				
126	PCB 126	5	6.89	6.60	0.57	1.29	U				
127	PCB 127	5	6.95	6.66	0.59	1.21	U				
128	PCB 128	6	6.74	6.45	0.51	2.03	J	4.2		0.001	
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.56	58.70		132.8		0.04	
130	PCB 130	6	6.80	6.51	0.54	1.05	U				
131	PCB 131	6	6.58	6.29	0.46	0.77	U				
132	PCB 132	6	6.58	6.29	0.46	13.80		25.4		0.01	
133	PCB 133	6	6.86	6.57	0.56	0.96	U				
134	PCB 134	6	6.55	6.26	0.45	0.73	U				
135	PCBs 135 + 154	6	6.70	6.42	0.50	7.69	J	15.4		0.01	
136	PCB 136	6	6.22	5.93	0.33	13.20		19.7		0.02	

PW002 Porewater Calculations. ALS Data

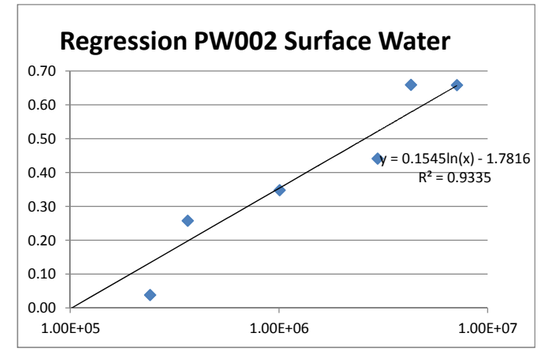
Low Load PRCs

Performance Reference Compounds				PW002 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	717	27	0.04	0.96
PCB 54	4	4.923	8.38E+04	660	9	0.01	0.99
PCB 47	4	5.563	3.66E+05	564	145	0.26	0.74
PCB 97	5	6.003	1.01E+06	890	309	0.35	0.65
PCB 111	5	6.473	2.97E+06	1190	524	0.44	0.56
PCB 153	6	6.633	4.30E+06	1210	797	0.66	0.34
PCB 178	7	6.853	7.13E+06	1210	796	0.66	0.34

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 30% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.09	-0.07
PCB 54	0.26	-0.02	0.28
PCB 47	0.35	0.13	0.22
PCB 97	0.44	0.23	0.21
PCB 111	0.66	0.34	0.32
PCB 153	0.66	0.37	0.29
PCB 178	0.66	0.42	0.23



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
137	PCB 137	6	6.83	6.54	0.55	0.84	U				
139	PCBs 139 + 140	6	6.67	6.38	0.49	0.82	U				
141	PCB 141	6	6.82	6.53	0.54	13.50		29.5		0.01	
142	PCB 142	6	6.51	6.22	0.43	1.06	U				
143	PCB 143	6	6.60	6.31	0.46	1.11	U				
144	PCB 144	6	6.67	6.38	0.49	4.16	J	8.1		0.003	
145	PCB 145	6	6.25	5.96	0.34	0.34	U				
146	PCB 146	6	6.89	6.60	0.57	9.17		21.2		0.005	
147	PCBs 147 + 149	6	6.66	6.37	0.48	58.80		113.9		0.05	
148	PCB 148	6	6.73	6.44	0.51	0.50	U				
150	PCB 150	6	6.32	6.03	0.36	0.67	J	1.0		0.001	
151	PCB 151	6	6.64	6.35	0.48	31.70		60.8		0.03	
152	PCB 152	6	6.22	5.93	0.33	0.41	U				
153	PCBs 153 + 168	6	7.03	6.74	0.62						
155	PCB 155	6	6.41	6.12	0.40	0.34	U				
156	PCBs 156 + 157	6	7.18	6.89	0.67	2.65	J	8.0		0.001	
158	PCB 158	6	7.02	6.73	0.61	27.30		70.7		0.01	
159	PCB 159	6	7.24	6.95	0.69	0.58	U				
160	PCB 160	6	6.93	6.64	0.58	0.40	U				
161	PCB 161	6	7.08	6.79	0.64	0.66	U				
162	PCB 162	6	7.24	6.95	0.69	0.55	U				
164	PCB 164	6	7.02	6.73	0.61	3.13	J	8.1		0.001	
165	PCB 165	6	7.05	6.76	0.62	0.67	U				
166	PCB 166	6	6.93	6.64	0.58	0.69	U				
167	PCB 167	6	7.27	6.98	0.70	1.17	J	3.9		0.0004	
169	PCB 169	6	7.42	7.13	0.76	0.48	U				
170	PCB 170	7	7.27	6.98	0.70	11.00		37.0		0.004	
171	PCBs 171 + 173	7	7.07	6.78	0.63	3.43	J	9.3		0.002	
172	PCB 172	7	7.33	7.04	0.72	2.08	J	7.5		0.001	
174	PCB 174	7	7.11	6.82	0.65	16.40		46.3		0.007	
175	PCB 175	7	7.17	6.88	0.67	1.38	J	4.1		0.0005	
176	PCB 176	7	6.76	6.47	0.52	0.29	U				
177	PCB 177	7	7.08	6.79	0.64	10.30		28.2		0.005	
178	PCB 178	7	7.14	6.853	0.66						
179	PCB 179	7	6.73	6.44	0.51	8.62		17.6		0.01	
180	PCBs 180 + 193	7	7.45	7.16	0.77	24.60		105.0		0.01	
181	PCB 181	7	7.11	6.82	0.65	0.75	U				
182	PCB 182	7	7.20	6.91	0.68	0.37	U				
183	PCB 183	7	7.20	6.91	0.68	9.79	J	30.4		0.004	
184	PCB 184	7	6.85	6.56	0.55	0.25	U				
185	PCB 185	7	7.11	6.82	0.65	1.83	J	5.2		0.001	
186	PCB 186	7	6.69	6.40	0.50	0.27	U				
187	PCB 187	7	7.17	6.88	0.67	19.20		57.7		0.01	
188	PCB 188	7	6.82	6.53	0.54	0.34	U				
189	PCB 189	7	7.71	7.42	0.86	0.57	U				
190	PCB 190	7	7.46	7.17	0.77	2.93	J	12.7		0.001	
191	PCB 191	7	7.55	7.26	0.80	0.64	U				
192	PCB 192	7	7.52	7.23	0.79	0.63	U				
194	PCB 194	8	7.80	7.51	0.89	3.00	J	27.6		0.001	
195	PCB 195	8	7.56	7.27	0.81	1.96	J	10.1		0.0005	
196	PCB 196	8	7.65	7.36	0.84	1.84	J	11.3		0.0005	
197	PCB 197	8	7.30	7.01	0.71	0.304	U				
198	PCBs 198 + 199	8	7.46	7.17	0.77	3.89	J	16.9		0.001	
200	PCB 200	8	7.27	6.98	0.70	0.394	J	1.3		0.0001	
201	PCB 201	8	7.62	7.33	0.83	0.581	J	3.4		0.0002	

PW002 Porewater Calculations. ALS Data

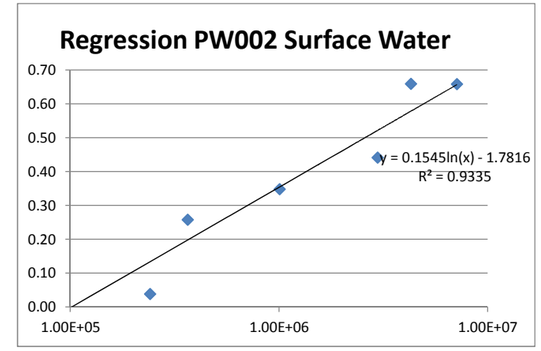
Low Load PRCs

Performance Reference Compounds				PW002 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	717	27	0.04	0.96
PCB 54	4	4.923	8.38E+04	660	9	0.01	0.99
PCB 47	4	5.563	3.66E+05	564	145	0.26	0.74
PCB 97	5	6.003	1.01E+06	890	309	0.35	0.65
PCB 111	5	6.473	2.97E+06	1190	524	0.44	0.56
PCB 153	6	6.633	4.30E+06	1210	797	0.66	0.34
PCB 178	7	6.853	7.13E+06	1210	796	0.66	0.34

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 30% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.09	-0.07
PCB 54	0.26	-0.02	0.28
PCB 47	0.35	0.13	0.22
PCB 97	0.44	0.23	0.21
PCB 111	0.66	0.34	0.32
PCB 153	0.66	0.37	0.29
PCB 178	0.66	0.42	0.23



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining	PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
202	PCB 202	8	7.24	6.95	0.69	0.913	J	3.0		0.0003	
203	PCB 203	8	7.65	7.36	0.84	2.17	J	13.4		0.0006	
204	PCB 204	8	7.30	7.01	0.71	0.336	U				
205	PCB 205	8	8.00	7.71	0.96	0.42	U				
206	PCB 206	9	8.09	7.80	0.99	0.556	U				
207	PCB 207	9	7.74	7.45	0.87	0.385	U				
208	PCB 208	9	7.71	7.42	0.86	0.353	U				
209	PCB 209	10	8.18	7.89	0.99	0.734	J	73.4		0.0009	

Note: If the percent lost > = 1.0, substituted 0.99 to fit the equation

Sum **1.04**

Performance Reference Compounds

PRCs not included in porewater calculations

PW003 Porewater Calculations. ALS Data

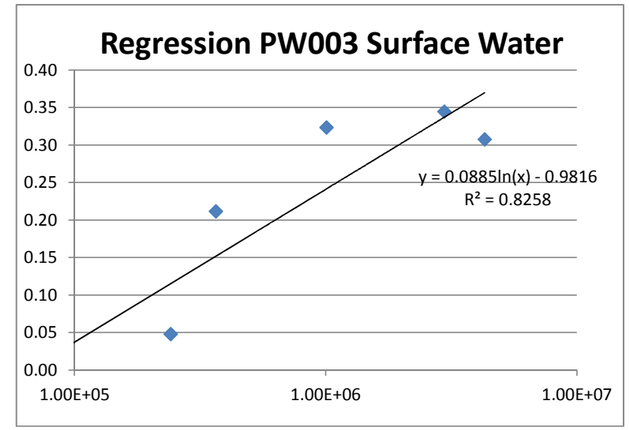
High Load PRCs

Performance Reference Compounds				PW003 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17800	849	0.05	0.95
PCB 54	4	4.923	8.38E+04	15800	40	0.00	1.00
PCB 47	4	5.563	3.66E+05	14800	3130	0.21	0.79
PCB 97	5	6.003	1.01E+06	20600	6660	0.32	0.68
PCB 111	5	6.473	2.97E+06	28900	9950	0.34	0.66
PCB 153	6	6.633	4.30E+06	29500	9070	0.31	0.69
PCB 178	7	6.853	7.13E+06	30000	6970	0.23	0.77

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.05	0.12	-0.07
PCB 54	0.00	0.02	-0.02
PCB 47	0.21	0.15	0.06
PCB 97	0.32	0.24	0.08
PCB 111	0.34	0.34	0.01
PCB 153	0.31	0.37	-0.06
PCB 178	0.31	0.41	-0.11



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**	**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
1	PCB 1	1	4.46	4.17	0.00	4.46	U				
2	PCB 2	1	4.69	4.40	0.00	6.62	U				
3	PCB 3	1	4.69	4.40	0.00	6.80	U				
4	PCB 4	2	4.65	4.36	0.00	2.25	U				
5	PCB 5	2	4.97	4.68	0.00	2.56	U				
6	PCB 6	2	5.06	4.77	0.00	2.60	U				
7	PCB 7	2	5.07	4.78	0.00	2.30	U				
8	PCB 8	2	5.07	4.78	0.00	2.29	U				
9	PCB 9	2	5.06	4.77	0.00	2.88	U				
10	PCB 10	2	4.84	4.55	0.00	1.86	U				
11	PCB 11	2	5.28	4.99	0.04	2.91	U				
12	PCBs 12 + 13	2	5.26	4.97	0.03	2.66	U				
14	PCB 14	2	5.28	4.99	0.04	2.62	U				
15	PCB 15	2	5.30	5.01	0.04	3.50	U				
16	PCB 16	3	5.16	4.87	0.01	16.70	U				
17	PCB 17	3	5.25	4.96	0.03	14.60	U				
18	PCB 18	3	5.24	4.95	0.03	9.89	U				
19	PCB 19	3	5.02	4.73	0.00	11.20	U				
20	PCBs 20 + 28	3	5.62	5.34	0.11						
21	PCBs 21 + 33	3	5.56	5.27	0.09	9.29	U				
22	PCB 22	3	5.58	5.29	0.10	11.00	U				
23	PCB 23	3	5.57	5.28	0.10	10.10	U				
24	PCB 24	3	5.35	5.06	0.05	9.52	U				
25	PCB 25	3	5.67	5.38	0.12	8.37	U				
26	PCBs 26 + 29	3	5.63	5.34	0.11	10.70	U				
27	PCB 27	3	5.44	5.15	0.07	10.40	U				
30	PCB 30	3	5.15	5.15	0.07	14.10	U				
31	PCB 31	3	5.38	5.38	0.12	10.60	U				
32	PCB 32	3	5.15	5.15	0.07	9.65	U				
34	PCB 34	3	5.37	5.37	0.11	12.50	U				
35	PCB 35	3	5.53	5.53	0.15	12.30	U				
36	PCB 36	3	5.59	5.59	0.16	10.20	U				
37	PCB 37	3	5.54	5.54	0.15	16.50	U				
38	PCB 38	3	5.47	5.47	0.13	11.40	U				
39	PCB 39	3	5.60	5.60	0.16	9.33	U				
40	PCBs 40 + 71	4	5.85	5.56	0.15	7.46	U				
41	PCB 41	4	5.40	5.40	0.12	9.54	U				
42	PCB 42	4	5.47	5.47	0.13	6.26	U				
43	PCBs 43 + 73	4	5.92	5.63	0.17	6.92	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.15						
45	PCBs 45 + 51	4	5.58	5.30	0.10	9.91	J	11.0		0.06	
46	PCB 46	4	5.53	5.24	0.09	9.07	U				
48	PCB 48	4	5.78	5.49	0.14	6.97	U				

PW003 Porewater Calculations. ALS Data

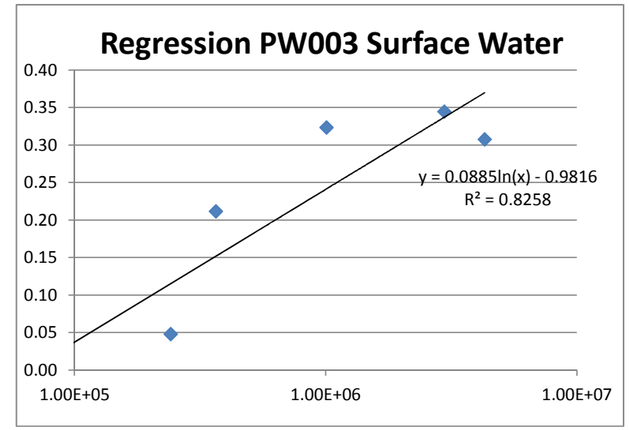
High Load PRCs

Performance Reference Compounds				PW003 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17800	849	0.05	0.95
PCB 54	4	4.923	8.38E+04	15800	40	0.00	1.00
PCB 47	4	5.563	3.66E+05	14800	3130	0.21	0.79
PCB 97	5	6.003	1.01E+06	20600	6660	0.32	0.68
PCB 111	5	6.473	2.97E+06	28900	9950	0.34	0.66
PCB 153	6	6.633	4.30E+06	29500	9070	0.31	0.69
PCB 178	7	6.853	7.13E+06	30000	6970	0.23	0.77

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.05	0.12	-0.07
PCB 54	0.00	0.02	-0.02
PCB 47	0.21	0.15	0.06
PCB 97	0.32	0.24	0.08
PCB 111	0.34	0.34	0.01
PCB 153	0.31	0.37	-0.06
PCB 178	0.31	0.41	-0.11



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**	**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
49	PCB 49	4	5.85	5.56	0.15	25.10	J	29.6		0.08	
50	PCBs 50 + 53	4	5.63	5.34	0.11	7.69	U				
52	PCB 52	4	5.84	5.55	0.15	7.90	U				
54	PCB 54	4	5.21	4.92	0.02						
55	PCB 55	4	6.11	5.82	0.21	6.84	U				
56	PCB 56	4	6.11	5.82	0.21	7.02	U				
57	PCB 57	4	6.17	5.88	0.22	6.42	U				
58	PCB 58	4	6.17	5.88	0.22	6.13	U				
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.18	8.18	U				
60	PCB 60	4	6.11	5.82	0.21	6.29	U				
61	PCB 61	4	6.04	5.75	0.19	6.15	U				
62	PCB 63	4	6.17	5.88	0.22	6.16	U				
64	PCB 64	4	5.95	5.66	0.17	3.95	U				
66	PCB 66	4	6.20	5.91	0.22	6.58	U				
67	PCB 67	4	6.20	5.91	0.22	5.45	U				
68	PCB 68	4	6.26	5.97	0.24	5.49	U				
69	PCB 69	4	6.04	5.75	0.19	4.64	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.22	5.35	U				
72	PCB 72	4	6.26	5.97	0.24	5.88	U				
77	PCB 77	4	6.36	6.07	0.26	8.21	U				
78	PCB 78	4	6.35	6.06	0.25	7.36	U				
79	PCB 79	4	6.42	6.13	0.27	179.00		244.8		0.18	
80	PCB 80	4	6.48	6.19	0.28	5.69	U				
81	PCB 81	4	6.36	6.07	0.26	8.02	U				
82	PCB 82	5	6.20	5.91	0.22	19.00	U				
83	PCBs 83 + 99	5	6.33	6.04	0.25	12.20	U				
84	PCB 84	5	6.04	5.75	0.19	12.00	U				
85	PCB 85	5	6.30	6.01	0.24	12.30	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.27						
88	PCB 88	5	6.07	5.78	0.20	10.60	U				
89	PCB 89	5	6.07	5.78	0.20	16.00	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.27	10.50	U				
91	PCB 91	5	6.13	5.84	0.21	8.53	U				
92	PCB 92	5	6.35	6.06	0.25	12.50	U				
93	PCB 93	5	6.04	5.75	0.19	10.60	U				
94	PCB 94	5	6.13	5.84	0.21	10.00	U				
95	PCBs 95 + 100	5	6.18	5.90	0.22	20.30	J	26.0		0.03	
96	PCB 96	5	5.71	5.42	0.12	7.36	U				
98	PCBs 98 + 102	5	6.15	5.86	0.21	8.67	U				
103	PCB 103	5	6.22	5.93	0.23	8.72	U				
104	PCB 104	5	5.81	5.52	0.14	6.86	U				
105	PCB 105	5	6.65	6.36	0.32	17.80	U				

PW003 Porewater Calculations. ALS Data

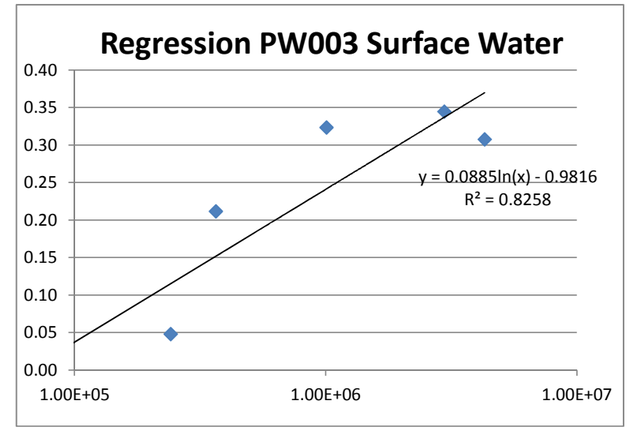
High Load PRCs

Performance Reference Compounds				PW003 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17800	849	0.05	0.95
PCB 54	4	4.923	8.38E+04	15800	40	0.00	1.00
PCB 47	4	5.563	3.66E+05	14800	3130	0.21	0.79
PCB 97	5	6.003	1.01E+06	20600	6660	0.32	0.68
PCB 111	5	6.473	2.97E+06	28900	9950	0.34	0.66
PCB 153	6	6.633	4.30E+06	29500	9070	0.31	0.69
PCB 178	7	6.853	7.13E+06	30000	6970	0.23	0.77

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.05	0.12	-0.07
PCB 54	0.00	0.02	-0.02
PCB 47	0.21	0.15	0.06
PCB 97	0.32	0.24	0.08
PCB 111	0.34	0.34	0.01
PCB 153	0.31	0.37	-0.06
PCB 178	0.31	0.41	-0.11



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**	**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
106	PCB 106	5	6.64	6.35	0.31	16.40	U				
107	PCB 107	5	6.71	6.42	0.33	17.30	U				
108	PCBs 108 + 124	5	6.72	6.43	0.33	15.90	U				
110	PCBs 110 + 115	5	6.49	6.20	0.28	7.42	U				
111	PCB 111	5	6.76	6.473	0.34						
112	PCB 112	5	6.45	6.16	0.27	8.75	U				
114	PCB 114	5	6.65	6.36	0.32	18.40	U				
117	PCBs 116 + 117	5	6.40	6.11	0.26	9.12	U				
118	PCB 118	5	6.74	6.45	0.33	18.30	U				
120	PCB 120	5	6.79	6.50	0.34	8.71	U				
121	PCB 121	5	6.64	6.35	0.31	7.36	U				
122	PCB 122	5	6.64	6.35	0.31	18.60	U				
123	PCB 123	5	6.74	6.45	0.33	18.10	U				
126	PCB 126	5	6.89	6.60	0.36	18.70	U				
127	PCB 127	5	6.95	6.66	0.38	20.00	U				
128	PCB 128	6	6.74	6.45	0.33	8.88	U				
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.36	42.60	J	66.5		0.02	
130	PCB 130	6	6.80	6.51	0.35	10.10	U				
131	PCB 131	6	6.58	6.29	0.30	7.72	U				
132	PCB 132	6	6.58	6.29	0.30	8.99	U				
133	PCB 133	6	6.86	6.57	0.36	9.61	U				
134	PCB 134	6	6.55	6.26	0.30	7.23	U				
135	PCBs 135 + 154	6	6.70	6.42	0.33	9.29	J	13.8		0.01	
136	PCB 136	6	6.22	5.93	0.23	5.79	U				
137	PCB 137	6	6.83	6.54	0.35	8.16	U				
139	PCBs 139 + 140	6	6.67	6.38	0.32	7.83	U				
141	PCB 141	6	6.82	6.53	0.35	14.30	J	22.0		0.01	
142	PCB 142	6	6.51	6.22	0.29	9.85	U				
143	PCB 143	6	6.60	6.31	0.31	9.49	U				
144	PCB 144	6	6.67	6.38	0.32	7.86	U				
145	PCB 145	6	6.25	5.96	0.23	5.08	U				
146	PCB 146	6	6.89	6.60	0.36	7.40	U				
147	PCBs 147 + 149	6	6.66	6.37	0.32	31.40	J	46.0		0.02	
148	PCB 148	6	6.73	6.44	0.33	8.09	U				
150	PCB 150	6	6.32	6.03	0.25	5.27	U				
151	PCB 151	6	6.64	6.35	0.31	23.10	J	33.7		0.01	
152	PCB 152	6	6.22	5.93	0.23	5.82	U				
153	PCBs 153 + 168	6	7.03	6.74	0.39						
155	PCB 155	6	6.41	6.12	0.27	4.82	U				
156	PCBs 156 + 157	6	7.18	6.89	0.42	19.70	U				
158	PCB 158	6	7.02	6.73	0.39	253.00		415.6		0.08	
159	PCB 159	6	7.24	6.95	0.44	12.10	U				
160	PCB 160	6	6.93	6.64	0.37	3.98	U				

PW003 Porewater Calculations. ALS Data

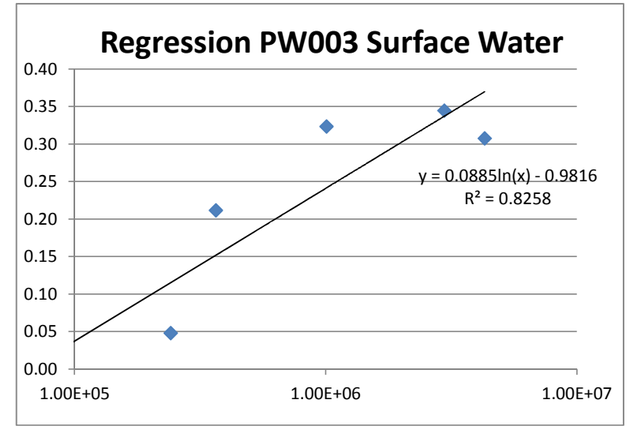
High Load PRCs

Performance Reference Compounds				PW003 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17800	849	0.05	0.95
PCB 54	4	4.923	8.38E+04	15800	40	0.00	1.00
PCB 47	4	5.563	3.66E+05	14800	3130	0.21	0.79
PCB 97	5	6.003	1.01E+06	20600	6660	0.32	0.68
PCB 111	5	6.473	2.97E+06	28900	9950	0.34	0.66
PCB 153	6	6.633	4.30E+06	29500	9070	0.31	0.69
PCB 178	7	6.853	7.13E+06	30000	6970	0.23	0.77

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.05	0.12	-0.07
PCB 54	0.00	0.02	-0.02
PCB 47	0.21	0.15	0.06
PCB 97	0.32	0.24	0.08
PCB 111	0.34	0.34	0.01
PCB 153	0.31	0.37	-0.06
PCB 178	0.31	0.41	-0.11



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**	**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
161	PCB 161	6	7.08	6.79	0.40	6.79	U				
162	PCB 162	6	7.24	6.95	0.44	11.40	U				
164	PCB 164	6	7.02	6.73	0.39	6.57	U				
165	PCB 165	6	7.05	6.76	0.40	6.47	U				
166	PCB 166	6	6.93	6.64	0.37	6.52	U				
167	PCB 167	6	7.27	6.98	0.44	9.70	U				
169	PCB 169	6	7.42	7.13	0.47	11.10	U				
170	PCB 170	7	7.27	6.98	0.44	15.80	U				
171	PCBs 171 + 173	7	7.07	6.78	0.40	15.00	U				
172	PCB 172	7	7.33	7.04	0.45	14.70	U				
174	PCB 174	7	7.11	6.82	0.41	12.80	U				
175	PCB 175	7	7.17	6.88	0.42	8.07	U				
176	PCB 176	7	6.76	6.47	0.34	5.82	U				
177	PCB 177	7	7.08	6.79	0.40	14.00	U				
178	PCB 178	7	7.14	6.853	0.42						
179	PCB 179	7	6.73	6.44	0.33	5.87	U				
180	PCBs 180 + 193	7	7.45	7.16	0.48	14.10	J	27.0		0.002	
181	PCB 181	7	7.11	6.82	0.41	12.00	U				
182	PCB 182	7	7.20	6.91	0.43	7.41	U				
183	PCB 183	7	7.20	6.91	0.43	13.10	U				
184	PCB 184	7	6.85	6.56	0.36	5.30	U				
185	PCB 185	7	7.11	6.82	0.41	12.80	U				
186	PCB 186	7	6.69	6.40	0.32	5.62	U				
187	PCB 187	7	7.17	6.88	0.42	6.82	U				
188	PCB 188	7	6.82	6.53	0.35	6.85	U				
189	PCB 189	7	7.71	7.42	0.53	10.40	U				
190	PCB 190	7	7.46	7.17	0.48	9.76	U				
191	PCB 191	7	7.55	7.26	0.50	11.20	U				
192	PCB 192	7	7.52	7.23	0.49	10.70	U				
194	PCB 194	8	7.80	7.51	0.55	9.73	U				
195	PCB 195	8	7.56	7.27	0.50	9.70	U				
196	PCB 196	8	7.65	7.36	0.52	9.51	U				
197	PCB 197	8	7.30	7.01	0.45	6.13	U				
198	PCBs 198 + 199	8	7.46	7.17	0.48	9.09	U				
200	PCB 200	8	7.27	6.98	0.44	6.69	U				
201	PCB 201	8	7.62	7.33	0.51	6.52	U				
202	PCB 202	8	7.24	6.95	0.44	6.98	U				
203	PCB 203	8	7.65	7.36	0.52	8.14	U				
204	PCB 204	8	7.30	7.01	0.45	6.55	U				
205	PCB 205	8	8.00	7.71	0.59	8.17	U				
206	PCB 206	9	8.09	7.80	0.61	11.9	U				
207	PCB 207	9	7.74	7.45	0.54	8.5	U				
208	PCB 208	9	7.71	7.42	0.53	7.34	U				

PW003 Porewater Calculations. ALS Data

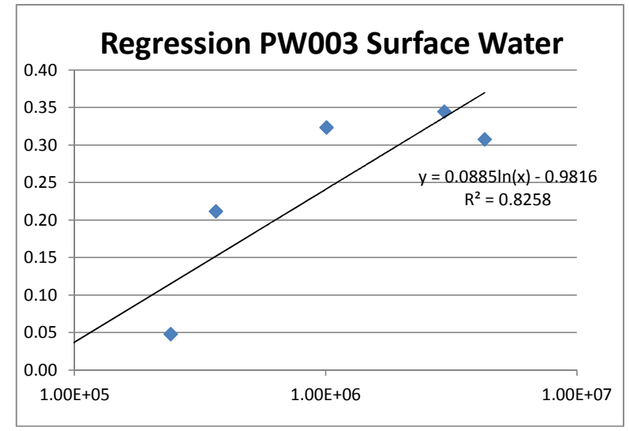
High Load PRCs

Performance Reference Compounds				PW003 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17800	849	0.05	0.95
PCB 54	4	4.923	8.38E+04	15800	40	0.00	1.00
PCB 47	4	5.563	3.66E+05	14800	3130	0.21	0.79
PCB 97	5	6.003	1.01E+06	20600	6660	0.32	0.68
PCB 111	5	6.473	2.97E+06	28900	9950	0.34	0.66
PCB 153	6	6.633	4.30E+06	29500	9070	0.31	0.69
PCB 178	7	6.853	7.13E+06	30000	6970	0.23	0.77

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.05	0.12	-0.07
PCB 54	0.00	0.02	-0.02
PCB 47	0.21	0.15	0.06
PCB 97	0.32	0.24	0.08
PCB 111	0.34	0.34	0.01
PCB 153	0.31	0.37	-0.06
PCB 178	0.31	0.41	-0.11



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**	**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
209	PCB 209	10	8.18	7.89	0.63	7.4	U				
							Sum		**0.49**		

Performance Reference Compounds

PRCs not included in porewater calculations

PW004 Porewater Calculations. ALS Data

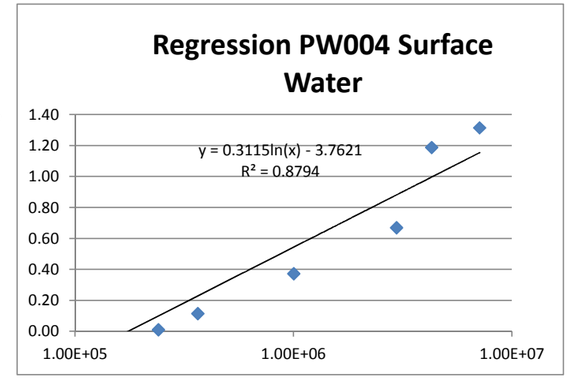
Low Load PRCs

Performance Reference Compounds				PW004 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	655	5.9	0.01	0.99
PCB 54	4	4.923	8.38E+04	536	6.4	0.01	0.99
PCB 47	4	5.563	3.66E+05	782	88	0.11	0.89
PCB 97	5	6.003	1.01E+06	621	231	0.37	0.63
PCB 111	5	6.473	2.97E+06	794	530	0.67	0.33
PCB 153	6	6.633	4.30E+06	795	943	1.19	-0.19
PCB 178	7	6.853	7.13E+06	759	997	1.31	-0.31

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.10	-0.09
PCB 54	0.01	-0.23	0.24
PCB 47	0.11	0.23	-0.11
PCB 97	0.37	0.54	-0.17
PCB 111	0.67	0.88	-0.21
PCB 153	1.19	1.00	0.19
PCB 178	1.31	1.15	0.16



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
1	PCB 1	1	4.46	4.17	0.00		0.27	U				
2	PCB 2	1	4.69	4.40	0.00		0.34	U				
3	PCB 3	1	4.69	4.40	0.00		0.36	U				
4	PCB 4	2	4.65	4.36	0.00		2.11		2.1		0.09	
5	PCB 5	2	4.97	4.68	0.00		0.14	U				
6	PCB 6	2	5.06	4.77	0.00		0.13	U				
7	PCB 7	2	5.07	4.78	0.00		0.12	U				
8	PCB 8	2	5.07	4.78	0.00		0.12	U				
9	PCB 9	2	5.06	4.77	0.00		0.14	U				
10	PCB 10	2	4.84	4.55	0.00		0.10	U				
11	PCB 11	2	5.28	4.99	0.00		0.70	J	0.7		0.01	
12	PCBs 12 + 13	2	5.26	4.97	0.00		0.13	U				
14	PCB 14	2	5.28	4.99	0.00		0.14	U				
15	PCB 15	2	5.30	5.01	0.00		0.39	J	0.4		0.00	
16	PCB 16	3	5.16	4.87	0.00		0.66	U				
17	PCB 17	3	5.25	4.96	0.00		4.57		4.6		0.05	
18	PCB 18	3	5.24	4.95	0.00		0.41	U				
19	PCB 19	3	5.02	4.73	0.00		8.52		8.5		0.16	
20	PCBs 20 + 28	3	5.62	5.34	0.07							
21	PCBs 21 + 33	3	5.56	5.27	0.02		0.51	U				
22	PCB 22	3	5.58	5.29	0.03		0.59	U				
23	PCB 23	3	5.57	5.28	0.03		0.54	U				
24	PCB 24	3	5.35	5.06	0.00		0.37	U				
25	PCB 25	3	5.67	5.38	0.10		0.43	U				
26	PCBs 26 + 29	3	5.63	5.34	0.07		0.59	U				
27	PCB 27	3	5.44	5.15	0.00		1.39	J	1.4		0.01	
30	PCB 30	3	5.15	5.15	0.00		0.94	J	0.9		0.01	
31	PCB 31	3	5.38	5.38	0.10		0.53	U				
32	PCB 32	3	5.15	5.15	0.00		2.15		2.2		0.02	
34	PCB 34	3	5.37	5.37	0.09		0.64	U				
35	PCB 35	3	5.53	5.53	0.21		0.61	U				
36	PCB 36	3	5.59	5.59	0.25		0.55	U				
37	PCB 37	3	5.54	5.54	0.21		0.76	U				
38	PCB 38	3	5.47	5.47	0.16		0.62	U				
39	PCB 39	3	5.60	5.60	0.26		0.52	U				
40	PCBs 40 + 71	4	5.85	5.56	0.23		3.62	J	4.7		0.01	
41	PCB 41	4	5.40	5.40	0.11		0.56	U				
42	PCB 42	4	5.47	5.47	0.16		1.01	J	1.2		0.00	
43	PCBs 43 + 73	4	5.92	5.63	0.28		0.40	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.21							
45	PCBs 45 + 51	4	5.58	5.30	0.04		18.60		19.3		0.10	
46	PCB 46	4	5.53	5.24	0.00		0.90	J	0.9		0.01	
48	PCB 48	4	5.78	5.49	0.18		0.42	U				
49	PCB 49	4	5.85	5.56	0.23		24.30		31.5		0.09	
50	PCBs 50 + 53	4	5.63	5.34	0.07		16.30		17.5		0.08	
52	PCB 52	4	5.84	5.55	0.22		25.80		33.1		0.09	
54	PCB 54	4	5.21	4.92	0.00							
55	PCB 55	4	6.11	5.82	0.41		0.37	U				
56	PCB 56	4	6.11	5.82	0.41		0.38	J	0.6		0.00	
57	PCB 57	4	6.17	5.88	0.46		0.37	U				

PW004 Porewater Calculations. ALS Data

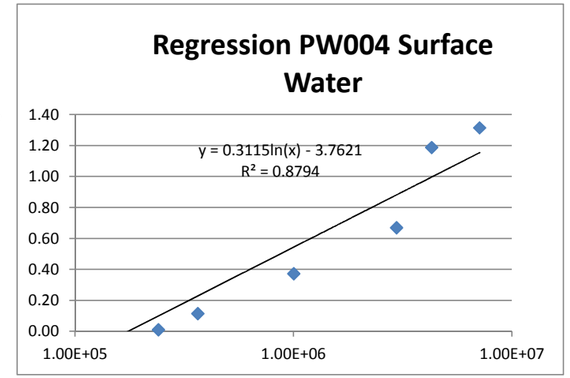
Low Load PRCs

Performance Reference Compounds				PW004 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	655	5.9	0.01	0.99
PCB 54	4	4.923	8.38E+04	536	6.4	0.01	0.99
PCB 47	4	5.563	3.66E+05	782	88	0.11	0.89
PCB 97	5	6.003	1.01E+06	621	231	0.37	0.63
PCB 111	5	6.473	2.97E+06	794	530	0.67	0.33
PCB 153	6	6.633	4.30E+06	795	943	1.19	-0.19
PCB 178	7	6.853	7.13E+06	759	997	1.31	-0.31

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.10	-0.09
PCB 54	0.01	-0.23	0.24
PCB 47	0.11	0.23	-0.11
PCB 97	0.37	0.54	-0.17
PCB 111	0.67	0.88	-0.21
PCB 153	1.19	1.00	0.19
PCB 178	1.31	1.15	0.16



Analytes and Partitioning Coefficients					Water Column						
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
58	PCB 58	4	6.17	5.88	0.46		1.02	J	1.9		0.00	
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.31		2.00	J	2.9		0.01	
60	PCB 60	4	6.11	5.82	0.41		0.21	U				
61	PCB 61	4	6.04	5.75	0.36		0.35	U				
62	PCB 63	4	6.17	5.88	0.46		0.33	U				
64	PCB 64	4	5.95	5.66	0.30		0.65	J	0.9		0.00	
66	PCB 66	4	6.20	5.91	0.48		2.65	J	5.1		0.01	
67	PCB 67	4	6.20	5.91	0.48		0.32	U				
68	PCB 68	4	6.26	5.97	0.52		0.31	U				
69	PCB 69	4	6.04	5.75	0.36		0.28	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.46		4.01	J	7.5		0.01	
72	PCB 72	4	6.26	5.97	0.52		0.33	U				
77	PCB 77	4	6.36	6.07	0.59		0.27	U				
78	PCB 78	4	6.35	6.06	0.59		0.23	U				
79	PCB 79	4	6.42	6.13	0.64		5.40		14.9		0.01	
80	PCB 80	4	6.48	6.19	0.68		0.20	J	0.6		0.00	
81	PCB 81	4	6.36	6.07	0.59		0.27	U				
82	PCB 82	5	6.20	5.91	0.48		1.61	U				
83	PCBs 83 + 99	5	6.33	6.04	0.57		10.70		25.0		0.02	
84	PCB 84	5	6.04	5.75	0.36		2.66	J	4.2		0.01	
85	PCB 85	5	6.30	6.01	0.55		0.76	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.63							
88	PCB 88	5	6.07	5.78	0.39		0.66	U				
89	PCB 89	5	6.07	5.78	0.39		1.03	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.65		31.70		89.8		0.06	
91	PCB 91	5	6.13	5.84	0.43		12.10		21.2		0.03	
92	PCB 92	5	6.35	6.06	0.59		6.21		15.0		0.01	
93	PCB 93	5	6.04	5.75	0.36		0.70	U				
94	PCB 94	5	6.13	5.84	0.43		2.17	J	3.8		0.01	
95	PCBs 95 + 100	5	6.18	5.90	0.47		38.10		71.4		0.09	
96	PCB 96	5	5.71	5.42	0.13		1.89	J	2.2		0.01	
98	PCBs 98 + 102	5	6.15	5.86	0.44		2.04	J	3.6		0.01	
103	PCB 103	5	6.22	5.93	0.49		5.15		10.2		0.01	
104	PCB 104	5	5.81	5.52	0.20		1.14	J	1.4		0.00	
105	PCB 105	5	6.65	6.36	0.80		1.85	J	9.3		0.00	
106	PCB 106	5	6.64	6.35	0.79		1.01	U				
107	PCB 107	5	6.71	6.42	0.84		0.89	U				
108	PCBs 108 + 124	5	6.72	6.43	0.85		0.93	U				
110	PCBs 110 + 115	5	6.49	6.20	0.68		11.60		36.6		0.02	
111	PCB 111	5	6.76	6.473	0.88							
112	PCB 112	5	6.45	6.16	0.66		0.52	U				
114	PCB 114	5	6.65	6.36	0.80		1.05	U				
117	PCBs 117 + 116	5	6.40	6.11	0.62		0.55	U				
118	PCB 118	5	6.74	6.45	0.87		6.72		50.3		0.02	
120	PCB 120	5	6.79	6.50	0.90		0.48	U				
121	PCB 121	5	6.64	6.35	0.79		0.43	U				
122	PCB 122	5	6.64	6.35	0.79		1.10	U				
123	PCB 123	5	6.74	6.45	0.87		1.05	U				
126	PCB 126	5	6.89	6.60	0.97		1.03	U				

PW004 Porewater Calculations. ALS Data

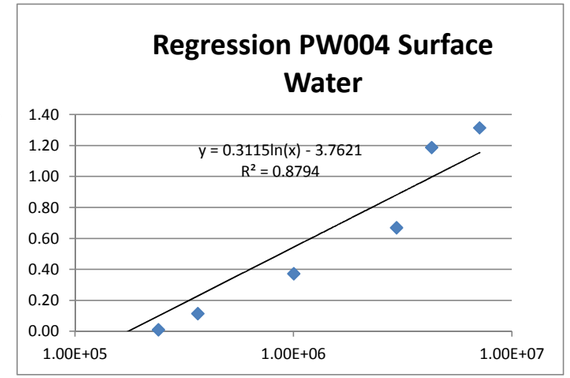
Low Load PRCs

Performance Reference Compounds				PW004 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	655	5.9	0.01	0.99
PCB 54	4	4.923	8.38E+04	536	6.4	0.01	0.99
PCB 47	4	5.563	3.66E+05	782	88	0.11	0.89
PCB 97	5	6.003	1.01E+06	621	231	0.37	0.63
PCB 111	5	6.473	2.97E+06	794	530	0.67	0.33
PCB 153	6	6.633	4.30E+06	795	943	1.19	-0.19
PCB 178	7	6.853	7.13E+06	759	997	1.31	-0.31

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.10	-0.09
PCB 54	0.01	-0.23	0.24
PCB 47	0.11	0.23	-0.11
PCB 97	0.37	0.54	-0.17
PCB 111	0.67	0.88	-0.21
PCB 153	1.19	1.00	0.19
PCB 178	1.31	1.15	0.16



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
127	PCB 127	5	6.95	6.66	1.02		0.96	U				
128	PCB 128	6	6.74	6.45	0.87		0.66	U				
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.95		41.70		923.6		0.24	
130	PCB 130	6	6.80	6.51	0.91		0.76	U				
131	PCB 131	6	6.58	6.29	0.75		0.56	U				
132	PCB 132	6	6.58	6.29	0.75		10.00		40.3		0.02	
133	PCB 133	6	6.86	6.57	0.95		0.70	U				
134	PCB 134	6	6.55	6.26	0.73		0.53	U				
135	PCBs 135 + 154	6	6.70	6.42	0.84		6.89	J	43.2		0.02	
136	PCB 136	6	6.22	5.93	0.49		11.50		22.7		0.03	
137	PCB 137	6	6.83	6.54	0.93		0.61	U				
139	PCBs 139 + 140	6	6.67	6.38	0.82		0.59	U				
141	PCB 141	6	6.82	6.53	0.92		10.00		131.1		0.04	
142	PCB 142	6	6.51	6.22	0.70		0.77	U				
143	PCB 143	6	6.60	6.31	0.77		0.81	U				
144	PCB 144	6	6.67	6.38	0.82		2.45	J	13.3		0.01	
145	PCB 145	6	6.25	5.96	0.51		0.17	U				
146	PCB 146	6	6.89	6.60	0.97		7.39		283.5		0.07	
147	PCBs 147 + 149	6	6.66	6.37	0.81		44.30		227.8		0.10	
148	PCB 148	6	6.73	6.44	0.86		0.39	J	2.8		0.00	
150	PCB 150	6	6.32	6.03	0.57		1.01	J	2.3		0.002	
151	PCB 151	6	6.64	6.35	0.79		22.50		109.6		0.05	
152	PCB 152	6	6.22	5.93	0.49		0.21	U				
153	PCBs 153 + 168	6	7.03	6.74	0.99							
155	PCB 155	6	6.41	6.12	0.63		0.17	U				
156	PCBs 156 + 157	6	7.18	6.89	0.99		1.67	J	167.0		0.02	
158	PCB 158	6	7.02	6.73	0.99		33.30		3330.0		0.62	
159	PCB 159	6	7.24	6.95	0.99		0.53	U				
160	PCB 160	6	6.93	6.64	0.99		0.29	U				
161	PCB 161	6	7.08	6.79	0.99		0.48	U				
162	PCB 162	6	7.24	6.95	0.99		0.50	U				
164	PCB 164	6	7.02	6.73	0.99		0.51	U				
165	PCB 165	6	7.05	6.76	0.99		0.48	U				
166	PCB 166	6	6.93	6.64	0.99		0.50	U				
167	PCB 167	6	7.27	6.98	0.99		0.53	J	53.1		0.01	
169	PCB 169	6	7.42	7.13	0.99		0.43	U				
170	PCB 170	7	7.27	6.98	0.99		8.45		845.0		0.09	
171	PCBs 171 + 173	7	7.07	6.78	0.99		2.52	J	252.0		0.04	
172	PCB 172	7	7.33	7.04	0.99		1.33	J	133.0		0.01	
174	PCB 174	7	7.11	6.82	0.99		9.28		928.0		0.14	
175	PCB 175	7	7.17	6.88	0.99		1.86	J	186.0		0.02	
176	PCB 176	7	6.76	6.47	0.88		0.28	U				
177	PCB 177	7	7.08	6.79	0.99		6.52		652.0		0.11	
178	PCB 178	7	7.14	6.853	0.99							
179	PCB 179	7	6.73	6.44	0.86		5.85		41.5		0.01	
180	PCBs 180 + 193	7	7.45	7.16	0.99		15.20		1520.0		0.11	
181	PCB 181	7	7.11	6.82	0.99		0.65	U				
182	PCB 182	7	7.20	6.91	0.99		0.35	U				
183	PCB 183	7	7.20	6.91	0.99		5.46	J	546.0		0.07	
184	PCB 184	7	6.85	6.56	0.95		0.24	U				

PW004 Porewater Calculations. ALS Data

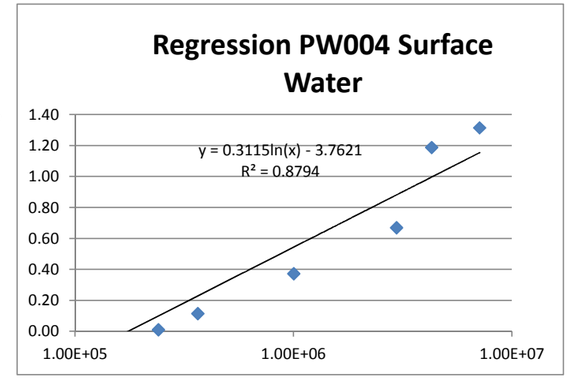
Low Load PRCs

Performance Reference Compounds				PW004 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	655	5.9	0.01	0.99
PCB 54	4	4.923	8.38E+04	536	6.4	0.01	0.99
PCB 47	4	5.563	3.66E+05	782	88	0.11	0.89
PCB 97	5	6.003	1.01E+06	621	231	0.37	0.63
PCB 111	5	6.473	2.97E+06	794	530	0.67	0.33
PCB 153	6	6.633	4.30E+06	795	943	1.19	-0.19
PCB 178	7	6.853	7.13E+06	759	997	1.31	-0.31

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.01	0.10	-0.09
PCB 54	0.01	-0.23	0.24
PCB 47	0.11	0.23	-0.11
PCB 97	0.37	0.54	-0.17
PCB 111	0.67	0.88	-0.21
PCB 153	1.19	1.00	0.19
PCB 178	1.31	1.15	0.16



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
185	PCB 185	7	7.11	6.82	0.99		1.33	J	133.0		0.02	
186	PCB 186	7	6.69	6.40	0.83		0.26	U				
187	PCB 187	7	7.17	6.88	0.99		11.60		1160.0		0.15	
188	PCB 188	7	6.82	6.53	0.92		0.33	U				
189	PCB 189	7	7.71	7.42	0.99		0.49	U				
190	PCB 190	7	7.46	7.17	0.99		1.92	J	192.0		0.01	
191	PCB 191	7	7.55	7.26	0.99		0.56	U				
192	PCB 192	7	7.52	7.23	0.99		0.55	U				
194	PCB 194	8	7.80	7.51	0.99		2.12	J	212.0		0.01	
195	PCB 195	8	7.56	7.27	0.99		0.92	J	91.7		0.00	
196	PCB 196	8	7.65	7.36	0.99		1.76	J	176.0		0.01	
197	PCB 197	8	7.30	7.01	0.99		0.371	U				
198	PCBs 198 + 199	8	7.46	7.17	0.99		3.28	J	328.0		0.02	
200	PCB 200	8	7.27	6.98	0.99		0.413	U				
201	PCB 201	8	7.62	7.33	0.99		0.396	U				
202	PCB 202	8	7.24	6.95	0.99		0.8	J	80.0		0.01	
203	PCB 203	8	7.65	7.36	0.99		1.54	J	154.0		0.01	
204	PCB 204	8	7.30	7.01	0.99		0.41	U				
205	PCB 205	8	8.00	7.71	0.99		0.508	U				
206	PCB 206	9	8.09	7.80	0.99		0.703	J	70.3		0.00	
207	PCB 207	9	7.74	7.45	0.99		0.373	U				
208	PCB 208	9	7.71	7.42	0.99		0.338	U				
209	PCB 209	10	8.18	7.89	0.99		1.26	J	126.0		0.00	
										Sum	**3.12**	

Performance Reference Compounds

PRCs not included in porewater calculations

Note: If the percent lost = 1.0, substituted 0.99 to fit the equation

PW005 Porewater Calculations. ALS Data

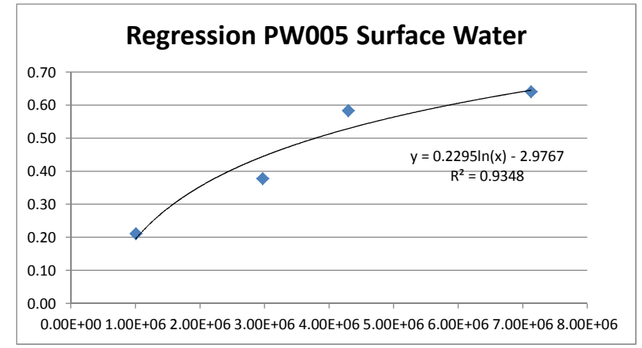
Low Load PRCs

Performance Reference Compounds				PW005 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	669	7.0	0.01	0.99
PCB 54	4	4.923	8.38E+04	607	5.6	0.01	0.99
PCB 47	4	5.563	3.66E+05	515	44.9	0.09	0.91
PCB 97	5	6.003	1.01E+06	834	176	0.21	0.79
PCB 111	5	6.473	2.97E+06	1060	401	0.38	0.62
PCB 153	6	6.633	4.30E+06	1030	601	0.58	0.42
PCB 178	7	6.853	7.13E+06	966	619	0.64	0.36

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining for Kpew > 5.5.

	Observed	Predicted	Difference
PCB 28	0.01	-0.13	0.14
PCB 54	0.01	-0.38	0.38
PCB 47	0.09	-0.04	0.12
PCB 97	0.21	0.20	0.02
PCB 111	0.38	0.44	-0.07
PCB 153	0.58	0.53	0.06
PCB 178	0.64	0.64	0.00



Analytes and Partitioning Coefficients					Water Column								
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**		
1	PCB 1	1	4.46	4.17	0.00		0.21	U					
2	PCB 2	1	4.69	4.40	0.00		0.26	U					
3	PCB 3	1	4.69	4.40	0.00		0.26	U					
4	PCB 4	2	4.65	4.36	0.00		0.49	J	0.5		0.021		
5	PCB 5	2	4.97	4.68	0.00		0.12	U					
6	PCB 6	2	5.06	4.77	0.00		0.11	U					
7	PCB 7	2	5.07	4.78	0.00		0.10	U					
8	PCB 8	2	5.07	4.78	0.00		0.10	U					
9	PCB 9	2	5.06	4.77	0.00		0.12	U					
10	PCB 10	2	4.84	4.55	0.00		0.11	U					
11	PCB 11	2	5.28	4.99	0.00		0.72	J	0.7		0.007		
12	PCBs 12 + 13	2	5.26	4.97	0.00		0.11	U					
14	PCB 14	2	5.28	4.99	0.00		0.12	U					
15	PCB 15	2	5.30	5.01	0.00		0.14	U					
16	PCB 16	3	5.16	4.87	0.00		0.56	U					
17	PCB 17	3	5.25	4.96	0.00		0.91	J	0.9		0.010		
18	PCB 18	3	5.24	4.95	0.00		0.35	U					
19	PCB 19	3	5.02	4.73	0.00								
20	PCBs 20 + 28	3	5.62	5.34	0.00		6.95				0.000		
21	PCBs 21 + 33	3	5.56	5.27	0.00		0.37	U					
22	PCB 22	3	5.58	5.29	0.00		0.42	U					
23	PCB 23	3	5.57	5.28	0.00		0.39	U					
24	PCB 24	3	5.35	5.06	0.00		0.31	U					
25	PCB 25	3	5.67	5.38	0.00		0.31	U					
26	PCBs 26 + 29	3	5.63	5.34	0.00		0.42	U					
27	PCB 27	3	5.44	5.15	0.00		0.38	U					
30	PCB 30	3	5.15	5.15	0.00		0.48	U					
31	PCB 31	3	5.38	5.38	0.00		0.38	U					
32	PCB 32	3	5.15	5.15	0.00		0.73	J	0.7		0.005		
34	PCB 34	3	5.37	5.37	0.00		0.46	U					
35	PCB 35	3	5.53	5.53	0.00		0.43	U					
36	PCB 36	3	5.59	5.59	0.00		0.39	U					
37	PCB 37	3	5.54	5.54	0.00		0.54	U					
38	PCB 38	3	5.47	5.47	0.00		0.45	U					
39	PCB 39	3	5.60	5.60	0.00		0.37	U					
40	PCBs 40 + 71	4	5.85	5.56	0.00		1.03	J	1.0		0.003		
41	PCB 41	4	5.40	5.40	0.00		0.27	U					
42	PCB 42	4	5.47	5.47	0.00		0.38	J	0.4		0.001		
43	PCBs 43 + 73	4	5.92	5.63	0.00		0.19	U					
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.00								
45	PCBs 45 + 51	4	5.58	5.30	0.00		3.76	J	3.8		0.019		
46	PCB 46	4	5.53	5.24	0.00		0.26	U					
48	PCB 48	4	5.78	5.49	0.00		0.20	U					
49	PCB 49	4	5.85	5.56	0.00		6.50	J	6.5		0.018		
50	PCBs 50 + 53	4	5.63	5.34	0.00		3.61	J	3.6		0.017		
52	PCB 52	4	5.84	5.55	0.00		7.13		7.1		0.020		
54	PCB 54	4	5.21	4.92	0.00								
55	PCB 55	4	6.11	5.82	0.10		0.18	U					
56	PCB 56	4	6.11	5.82	0.10		0.39	J	0.4		0.001		
57	PCB 57	4	6.17	5.88	0.13		0.18	U					
58	PCB 58	4	6.17	5.88	0.13		0.18	J	0.2		0.0003		
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.03		0.40	J	0.4		0.001		
60	PCB 60	4	6.11	5.82	0.10		0.15	U					

PW005 Porewater Calculations. ALS Data

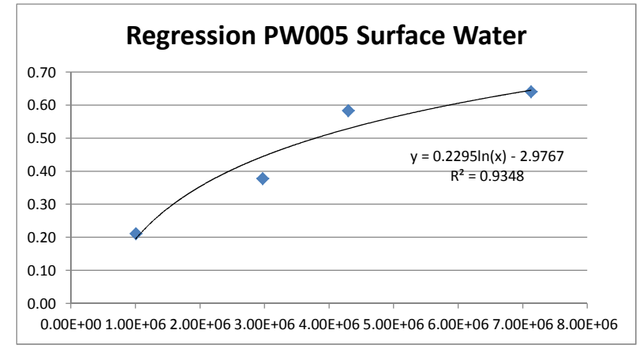
Low Load PRCs

Performance Reference Compounds				PW005 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	669	7.0	0.01	0.99
PCB 54	4	4.923	8.38E+04	607	5.6	0.01	0.99
PCB 47	4	5.563	3.66E+05	515	44.9	0.09	0.91
PCB 97	5	6.003	1.01E+06	834	176	0.21	0.79
PCB 111	5	6.473	2.97E+06	1060	401	0.38	0.62
PCB 153	6	6.633	4.30E+06	1030	601	0.58	0.42
PCB 178	7	6.853	7.13E+06	966	619	0.64	0.36

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining for Kpew > 5.5.

	Observed	Predicted	Difference
PCB 28	0.01	-0.13	0.14
PCB 54	0.01	-0.38	0.38
PCB 47	0.09	-0.04	0.12
PCB 97	0.21	0.20	0.02
PCB 111	0.38	0.44	-0.07
PCB 153	0.58	0.53	0.06
PCB 178	0.64	0.64	0.00



Analytes and Partitioning Coefficients					Water Column								
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**		
61	PCB 61	4	6.04	5.75	0.06		0.16	U					
62	PCB 63	4	6.17	5.88	0.13		0.16	U					
64	PCB 64	4	5.95	5.66	0.02		0.42	J	0.4		0.001		
66	PCB 66	4	6.20	5.91	0.15		1.76	J	2.1		0.003		
67	PCB 67	4	6.20	5.91	0.15		0.15	U					
68	PCB 68	4	6.26	5.97	0.18		0.15	U					
69	PCB 69	4	6.04	5.75	0.06		0.13	U					
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.14		2.53	J	2.9		0.004		
72	PCB 72	4	6.26	5.97	0.18		0.16	U					
77	PCB 77	4	6.36	6.07	0.23		0.19	U					
78	PCB 78	4	6.35	6.06	0.23		0.16	U					
79	PCB 79	4	6.42	6.13	0.26		3.72	J	5.1		0.004		
80	PCB 80	4	6.48	6.19	0.30		0.14	J	0.2		0.0001		
81	PCB 81	4	6.36	6.07	0.23		0.19	U					
82	PCB 82	5	6.20	5.91	0.15		1.19	U					
83	PCBs 83 + 99	5	6.33	6.04	0.22		4.59	J	5.9		0.005		
84	PCB 84	5	6.04	5.75	0.06		1.13	J	1.2		0.002		
85	PCB 85	5	6.30	6.01	0.20		0.56	U					
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.26								
88	PCB 88	5	6.07	5.78	0.08		0.46	U					
89	PCB 89	5	6.07	5.78	0.08		0.76	U					
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.27		16.10	J	22.1		0.016		
91	PCB 91	5	6.13	5.84	0.11		3.67	J	4.1		0.006		
92	PCB 92	5	6.35	6.06	0.23		0.55	U					
93	PCB 93	5	6.04	5.75	0.06		0.48	U					
94	PCB 94	5	6.13	5.84	0.11		0.75	J	0.8		0.001		
95	PCBs 95 + 100	5	6.18	5.90	0.14		14.10	J	16.4		0.021		
96	PCB 96	5	5.71	5.42	0.00		0.39	J	0.4		0.001		
98	PCBs 98 + 102	5	6.15	5.86	0.00		0.93	J	0.9		0.001		
103	PCB 103	5	6.22	5.93	0.16		1.56	J	1.9		0.002		
104	PCB 104	5	5.81	5.52	0.99		0.29	U					
105	PCB 105	5	6.65	6.36	0.39		1.24	J	2.0		0.001		
106	PCB 106	5	6.64	6.35	0.38		0.75	U					
107	PCB 107	5	6.71	6.42	0.42		0.66	U					
108	PCBs 108 + 124	5	6.72	6.43	0.42		0.70	U					
110	PCBs 110 + 115	5	6.49	6.20	0.30		6.44	J	9.2		0.006		
111	PCB 111	5	6.76	6.473	0.44								
112	PCB 112	5	6.45	6.16	0.28		0.38	U					
114	PCB 114	5	6.65	6.36	0.39		0.78	U					
117	PCBs 117 + 116	5	6.40	6.11	0.25		0.41	U					
118	PCB 118	5	6.74	6.45	0.43		5.05		8.9		0.003		
120	PCB 120	5	6.79	6.50	0.46		0.36	U					
121	PCB 121	5	6.64	6.35	0.38		0.32	U					
122	PCB 122	5	6.64	6.35	0.38		0.82	U					
123	PCB 123	5	6.74	6.45	0.43		0.77	U					
126	PCB 126	5	6.89	6.60	0.51		0.75	U					
127	PCB 127	5	6.95	6.66	0.54		0.72	U					
128	PCB 128	6	6.74	6.45	0.43		0.32	U					
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.50		21.40		42.7		0.011		
130	PCB 130	6	6.80	6.51	0.47		0.36	U					
131	PCB 131	6	6.58	6.29	0.35		0.27	U					
132	PCB 132	6	6.58	6.29	0.35		5.55		8.5		0.004		

PW005 Porewater Calculations. ALS Data

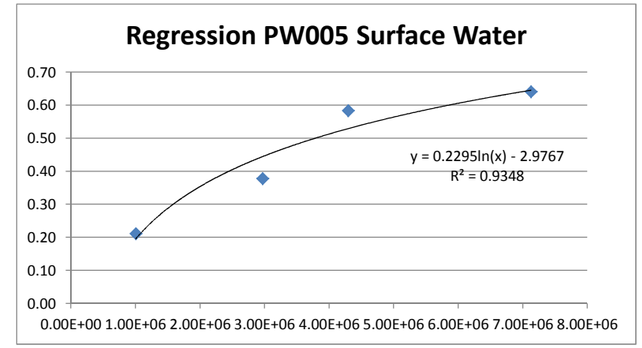
Low Load PRCs

Performance Reference Compounds				PW005 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	669	7.0	0.01	0.99
PCB 54	4	4.923	8.38E+04	607	5.6	0.01	0.99
PCB 47	4	5.563	3.66E+05	515	44.9	0.09	0.91
PCB 97	5	6.003	1.01E+06	834	176	0.21	0.79
PCB 111	5	6.473	2.97E+06	1060	401	0.38	0.62
PCB 153	6	6.633	4.30E+06	1030	601	0.58	0.42
PCB 178	7	6.853	7.13E+06	966	619	0.64	0.36

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining for Kpew > 5.5.

	Observed	Predicted	Difference
PCB 28	0.01	-0.13	0.14
PCB 54	0.01	-0.38	0.38
PCB 47	0.09	-0.04	0.12
PCB 97	0.21	0.20	0.02
PCB 111	0.38	0.44	-0.07
PCB 153	0.58	0.53	0.06
PCB 178	0.64	0.64	0.00



Analytes and Partitioning Coefficients					Water Column								
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**		
133	PCB 133	6	6.86	6.57	0.50		0.34	U					
134	PCB 134	6	6.55	6.26	0.33		0.26	U					
135	PCBs 135 + 154	6	6.70	6.42	0.41		2.70	J	4.6		0.002		
136	PCB 136	6	6.22	5.93	0.16		4.89	J	5.8		0.007		
137	PCB 137	6	6.83	6.54	0.48		0.29	U					
139	PCBs 139 + 140	6	6.67	6.38	0.40		0.29	U					
141	PCB 141	6	6.82	6.53	0.48		5.35	J	10.2		0.003		
142	PCB 142	6	6.51	6.22	0.31		0.37	U					
143	PCB 143	6	6.60	6.31	0.36		0.39	U					
144	PCB 144	6	6.67	6.38	0.40		1.26	J	2.1		0.001		
145	PCB 145	6	6.25	5.96	0.17		0.13	U					
146	PCB 146	6	6.89	6.60	0.51		2.60	J	5.3		0.001		
147	PCBs 147 + 149	6	6.66	6.37	0.39		20.10		32.9		0.014		
148	PCB 148	6	6.73	6.44	0.43		0.19	U					
150	PCB 150	6	6.32	6.03	0.21		0.22	J	0.3		0.0003		
151	PCB 151	6	6.64	6.35	0.38		11.20		18.1		0.008		
152	PCB 152	6	6.22	5.93	0.16		0.16	U					
153	PCBs 153 + 168	6	7.03	6.74	0.58								
155	PCB 155	6	6.41	6.12	0.26		0.13	U					
156	PCBs 156 + 157	6	7.18	6.89	0.67		1.18	J	3.5		0.000		
158	PCB 158	6	7.02	6.73	0.58		19.70		47.1		0.009		
159	PCB 159	6	7.24	6.95	0.70		0.33	U					
160	PCB 160	6	6.93	6.64	0.53		0.14	U					
161	PCB 161	6	7.08	6.79	0.61		0.23	U					
162	PCB 162	6	7.24	6.95	0.70		0.31	U					
164	PCB 164	6	7.02	6.73	0.58		1.28	J	3.1		0.001		
165	PCB 165	6	7.05	6.76	0.60		0.23	U					
166	PCB 166	6	6.93	6.64	0.53		0.24	U					
167	PCB 167	6	7.27	6.98	0.71		0.27	U					
169	PCB 169	6	7.42	7.13	0.79		0.28	U					
170	PCB 170	7	7.27	6.98	0.71		6.34		22.1		0.002		
171	PCBs 171 + 173	7	7.07	6.78	0.61		1.68	J	4.3		0.001		
172	PCB 172	7	7.33	7.04	0.75		0.73	J	2.9		0.0003		
174	PCB 174	7	7.11	6.82	0.63		6.83		18.4		0.003		
175	PCB 175	7	7.17	6.88	0.66		0.22	U					
176	PCB 176	7	6.76	6.47	0.44		0.17	U					
177	PCB 177	7	7.08	6.79	0.61		3.33	J	8.6		0.001		
178	PCB 178	7	7.14	6.853	0.64								
179	PCB 179	7	6.73	6.44	0.43		2.54	J	4.4		0.002		
180	PCBs 180 + 193	7	7.45	7.16	0.81		9.25	J	48.0		0.003		
181	PCB 181	7	7.11	6.82	0.63		0.32	U					
182	PCB 182	7	7.20	6.91	0.68		0.22	U					
183	PCB 183	7	7.20	6.91	0.68		3.22	J	10.0		0.001		
184	PCB 184	7	6.85	6.56	0.49		0.15	U					
185	PCB 185	7	7.11	6.82	0.63		0.69	J	1.8		0.000		
186	PCB 186	7	6.69	6.40	0.41		0.16	U					
187	PCB 187	7	7.17	6.88	0.66		6.53		19.2		0.003		
188	PCB 188	7	6.82	6.53	0.48		0.21	U					
189	PCB 189	7	7.71	7.42	0.95		0.24	U					
190	PCB 190	7	7.46	7.17	0.81		1.02	J	5.5		0.0004		
191	PCB 191	7	7.55	7.26	0.86		0.27	U					
192	PCB 192	7	7.52	7.23	0.85		0.27	U					
194	PCB 194	8	7.80	7.51	0.99		1.46	J	224.4		0.0069		

PW005 Porewater Calculations. ALS Data

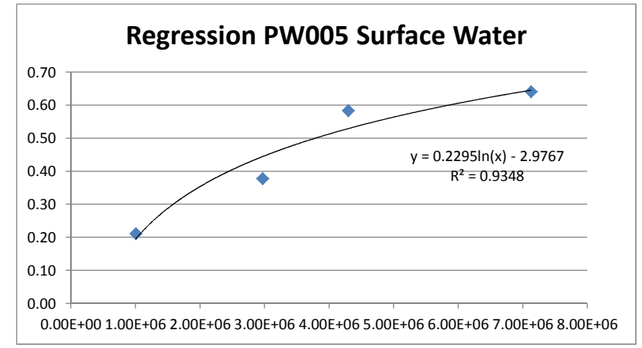
Low Load PRCs

Performance Reference Compounds				PW005 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	669	7.0	0.01	0.99
PCB 54	4	4.923	8.38E+04	607	5.6	0.01	0.99
PCB 47	4	5.563	3.66E+05	515	44.9	0.09	0.91
PCB 97	5	6.003	1.01E+06	834	176	0.21	0.79
PCB 111	5	6.473	2.97E+06	1060	401	0.38	0.62
PCB 153	6	6.633	4.30E+06	1030	601	0.58	0.42
PCB 178	7	6.853	7.13E+06	966	619	0.64	0.36

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining for Kpew > 5.5.

	Observed	Predicted	Difference
PCB 28	0.01	-0.13	0.14
PCB 54	0.01	-0.38	0.38
PCB 47	0.09	-0.04	0.12
PCB 97	0.21	0.20	0.02
PCB 111	0.38	0.44	-0.07
PCB 153	0.58	0.53	0.06
PCB 178	0.64	0.64	0.00



Analytes and Partitioning Coefficients					Water Column								
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**		
195	PCB 195	8	7.56	7.27	0.87		0.75	J	5.6		0.0003		
196	PCB 196	8	7.65	7.36	0.91		0.54	J	6.3		0.0003		
197	PCB 197	8	7.30	7.01	0.73		0.163	U					
198	PCBs 198 + 199	8	7.46	7.17	0.81		1.68	J	9.0		0.0006		
200	PCB 200	8	7.27	6.98	0.71		0.182	U					
201	PCB 201	8	7.62	7.33	0.90		0.174	U					
202	PCB 202	8	7.24	6.95	0.70		0.378	J	1.2		0.0001		
203	PCB 203	8	7.65	7.36	0.91		0.217	U					
204	PCB 204	8	7.30	7.01	0.73		0.18	U					
205	PCB 205	8	8.00	7.71	0.99		0.226	U					
206	PCB 206	9	8.09	7.80	1.15		0.379	U					
207	PCB 207	9	7.74	7.45	0.96		0.253	U					
208	PCB 208	9	7.71	7.42	0.95		0.224	U					
209	PCB 209	10	8.18	7.89	0.99		1.63	J	163.0		0.002		

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Sum **0.29**

Performance Reference Compounds

PRCs not included in porewater calculations

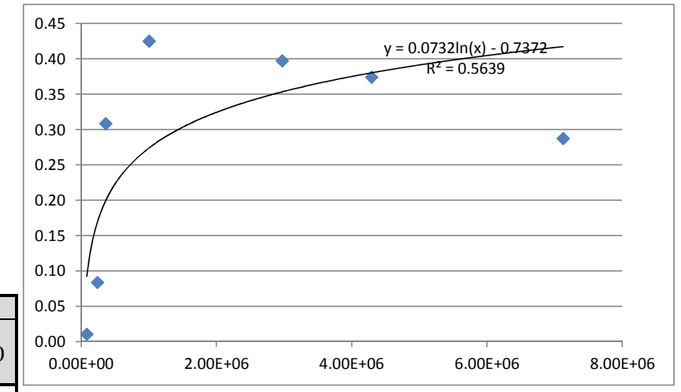
Note: If the percent lost = 1.0, substituted 0.99 to fit the equation

PW006 Porewater Calculations. ALS Data

Low Load PRCs

Performance Reference Compounds				PW006 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	17700	1480	0.08	0.92
PCB 54	4	4.923	8.38E+04	16200	172	0.01	0.99
PCB 47	4	5.563	3.66E+05	15300	4720	0.31	0.69
PCB 97	5	6.003	1.01E+06	20600	8760	0.43	0.57
PCB 111	5	6.473	2.97E+06	30200	12000	0.40	0.60
PCB 153	6	6.633	4.30E+06	31800	11900	0.37	0.63
PCB 178	7	6.853	7.13E+06	32000	9190	0.29	0.71

Average of 28 and 54 Kpew <5.5	0.05
Average of 97, 111, 153 and 178 Kpew >5.5	0.36



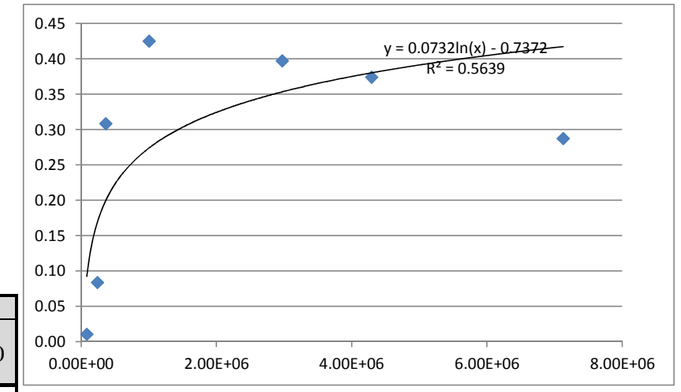
Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
1	PCB 1	1	4.46	4.17	0.05		8.72	U				
2	PCB 2	1	4.69	4.40	0.05		13.30	U				
3	PCB 3	1	4.69	4.40	0.05		13.90	U				
4	PCB 4	2	4.65	4.36	0.05		5.64	U				
5	PCB 5	2	4.97	4.68	0.05		5.64	U				
6	PCB 6	2	5.06	4.77	0.05		5.72	U				
7	PCB 7	2	5.07	4.78	0.05		5.06	U				
8	PCB 8	2	5.07	4.78	0.05		5.03	U				
9	PCB 9	2	5.06	4.77	0.05		6.32	U				
10	PCB 10	2	4.84	4.55	0.05		4.65	U				
11	PCB 11	2	5.28	4.99	0.05		6.40	U				
12	PCBs 12 + 13	2	5.26	4.97	0.05		5.84	U				
14	PCB 14	2	5.28	4.99	0.05		5.75	U				
15	PCB 15	2	5.30	5.01	0.05		7.71	U				
16	PCB 16	3	5.16	4.87	0.05		32.30	U				
17	PCB 17	3	5.25	4.96	0.05		28.20	U				
18	PCB 18	3	5.24	4.95	0.05		19.20	U				
19	PCB 19	3	5.02	4.73	0.05		47.40	J	49.7		0.920	
20	PCBs 20 + 28	3	5.62	5.34	0.05							
21	PCBs 21 + 33	3	5.56	5.27	0.05		21.90	U				
22	PCB 22	3	5.58	5.29	0.05		25.80	U				
23	PCB 23	3	5.57	5.28	0.05		23.80	U				
24	PCB 24	3	5.35	5.06	0.05		18.50	U				
25	PCB 25	3	5.67	5.38	0.05		19.80	U				
26	PCBs 26 + 29	3	5.63	5.34	0.05		25.30	U				
27	PCB 27	3	5.44	5.15	0.05		20.10	U				
30	PCB 30	3	5.15	5.15	0.05		27.30	U				
31	PCB 31	3	5.38	5.38	0.05		24.80	U				
32	PCB 32	3	5.15	5.15	0.05		18.80	U				
34	PCB 34	3	5.37	5.37	0.05		29.40	U				
35	PCB 35	3	5.53	5.53	0.36		28.90	U				
36	PCB 36	3	5.59	5.59	0.36		23.90	U				
37	PCB 37	3	5.54	5.54	0.36		36.60	U				
38	PCB 38	3	5.47	5.47	0.05		26.80	U				
39	PCB 39	3	5.60	5.60	0.36		22.00	U				
40	PCBs 40 + 71	4	5.85	5.56	0.36		18.20	U				
41	PCB 41	4	5.40	5.40	0.05		23.30	U				
42	PCB 42	4	5.47	5.47	0.05		15.30	U				
43	PCBs 43 + 73	4	5.92	5.63	0.36		16.90	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.36							
45	PCBs 45 + 51	4	5.58	5.30	0.05		85.70	J	89.9		0.455	
46	PCB 46	4	5.53	5.24	0.05		22.20	U				
48	PCB 48	4	5.78	5.49	0.05		17.00	U				
49	PCB 49	4	5.85	5.56	0.36		100.00	J	155.9		0.426	
50	PCBs 50 + 53	4	5.63	5.34	0.05		48.90	J	51.3		0.236	
52	PCB 52	4	5.84	5.55	0.36		56.00		87.3		0.244	
54	PCB 54	4	5.21	4.92	0.05							
55	PCB 55	4	6.11	5.82	0.36		16.70	U				
56	PCB 56	4	6.11	5.82	0.36		23.20	U				
57	PCB 57	4	6.17	5.88	0.36		15.70	U				

PW006 Porewater Calculations. ALS Data

Low Load PRCs

Performance Reference Compounds				PW006 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	17700	1480	0.08	0.92
PCB 54	4	4.923	8.38E+04	16200	172	0.01	0.99
PCB 47	4	5.563	3.66E+05	15300	4720	0.31	0.69
PCB 97	5	6.003	1.01E+06	20600	8760	0.43	0.57
PCB 111	5	6.473	2.97E+06	30200	12000	0.40	0.60
PCB 153	6	6.633	4.30E+06	31800	11900	0.37	0.63
PCB 178	7	6.853	7.13E+06	32000	9190	0.29	0.71

Average of 28 and 54 Kpew <5.5	0.05
Average of 97, 111, 153 and 178 Kpew >5.5	0.36



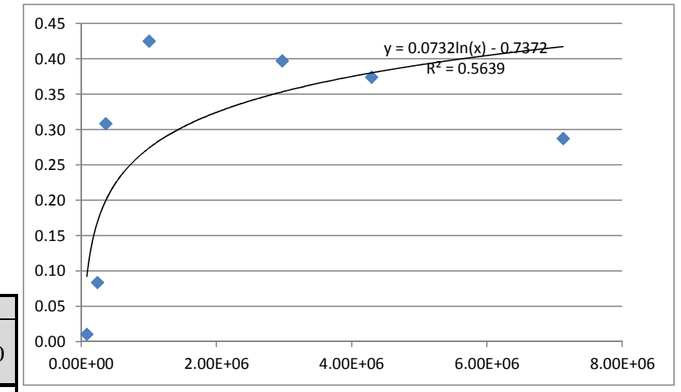
Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
58	PCB 58	4	6.17	5.88	0.36		15.00	U				
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.36		26.10	J	40.7		0.085	
60	PCB 60	4	6.11	5.82	0.36		20.80	U				
61	PCB 61	4	6.04	5.75	0.36		15.00	U				
62	PCB 63	4	6.17	5.88	0.36		15.10	U				
64	PCB 64	4	5.95	5.66	0.36		9.62	U				
66	PCB 66	4	6.20	5.91	0.36		16.10	U				
67	PCB 67	4	6.20	5.91	0.36		13.30	U				
68	PCB 68	4	6.26	5.97	0.36		13.40	U				
69	PCB 69	4	6.04	5.75	0.36		11.40	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.36		13.10	U				
72	PCB 72	4	6.26	5.97	0.36		14.40	U				
77	PCB 77	4	6.36	6.07	0.36		27.20	U				
78	PCB 78	4	6.35	6.06	0.36		24.30	U				
79	PCB 79	4	6.42	6.13	0.36		236.00		367.9		0.271	
80	PCB 80	4	6.48	6.19	0.36		18.80	U				
81	PCB 81	4	6.36	6.07	0.36		26.40	U				
82	PCB 82	5	6.20	5.91	0.36		41.70	U				
83	PCBs 83 + 99	5	6.33	6.04	0.36		36.80	J	57.4		0.052	
84	PCB 84	5	6.04	5.75	0.36		21.30	U				
85	PCB 85	5	6.30	6.01	0.36		26.90	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.36							
88	PCB 88	5	6.07	5.78	0.36		18.90	U				
89	PCB 89	5	6.07	5.78	0.36		35.20	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.36		77.60	J	121.0		0.086	
91	PCB 91	5	6.13	5.84	0.36		15.20	U				
92	PCB 92	5	6.35	6.06	0.36		27.50	U				
93	PCB 93	5	6.04	5.75	0.36		18.70	U				
94	PCB 94	5	6.13	5.84	0.36		17.80	U				
95	PCBs 95 + 100	5	6.18	5.90	0.36		78.10	J	121.7		0.155	
96	PCB 96	5	5.71	5.42	0.05		13.10	U				
98	PCBs 98 + 102	5	6.15	5.86	0.36		15.50	U				
103	PCB 103	5	6.22	5.93	0.36		15.50	U				
104	PCB 104	5	5.81	5.52	0.36		12.70	U				
105	PCB 105	5	6.65	6.36	0.36		36.00	U				
106	PCB 106	5	6.64	6.35	0.36		31.90	U				
107	PCB 107	5	6.71	6.42	0.36		33.70	U				
108	PCBs 108 + 124	5	6.72	6.43	0.36		31.00	U				
110	PCBs 110 + 115	5	6.49	6.20	0.36		30.00	J	46.8		0.030	
111	PCB 111	5	6.76	6.473	0.36							
112	PCB 112	5	6.45	6.16	0.36		19.30	U				
114	PCB 114	5	6.65	6.36	0.36		35.50	U				
117	PCBs 117 + 116	5	6.40	6.11	0.36		20.10	U				
118	PCB 118	5	6.74	6.45	0.36		35.40	U				
120	PCB 120	5	6.79	6.50	0.36		19.20	U				
121	PCB 121	5	6.64	6.35	0.36		16.20	U				
122	PCB 122	5	6.64	6.35	0.36		36.20	U				
123	PCB 123	5	6.74	6.45	0.36		34.20	U				
126	PCB 126	5	6.89	6.60	0.36		34.40	U				

PW006 Porewater Calculations. ALS Data

Low Load PRCs

Performance Reference Compounds				PW006 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	17700	1480	0.08	0.92
PCB 54	4	4.923	8.38E+04	16200	172	0.01	0.99
PCB 47	4	5.563	3.66E+05	15300	4720	0.31	0.69
PCB 97	5	6.003	1.01E+06	20600	8760	0.43	0.57
PCB 111	5	6.473	2.97E+06	30200	12000	0.40	0.60
PCB 153	6	6.633	4.30E+06	31800	11900	0.37	0.63
PCB 178	7	6.853	7.13E+06	32000	9190	0.29	0.71

Average of 28 and 54 Kpew <5.5	0.05
Average of 97, 111, 153 and 178 Kpew >5.5	0.36



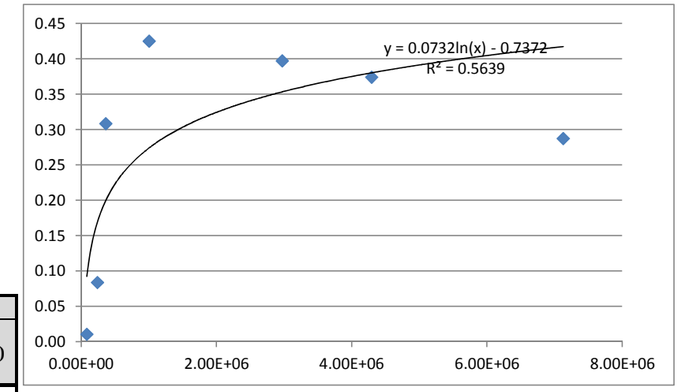
Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
127	PCB 127	5	6.95	6.66	0.36		39.00	U				
128	PCB 128	6	6.74	6.45	0.36		24.70	U				
129	PCBs 129 + 138 + 163	6	6.86	6.58	0.36		169.00	J	263.4		0.070	
130	PCB 130	6	6.80	6.51	0.36		28.00	U				
131	PCB 131	6	6.58	6.29	0.36		21.50	U				
132	PCB 132	6	6.58	6.29	0.36		45.00	J	70.1		0.036	
133	PCB 133	6	6.86	6.57	0.36		26.80	U				
134	PCB 134	6	6.55	6.26	0.36		20.10	U				
135	PCBs 135 + 154	6	6.70	6.42	0.36		30.60	J	47.7		0.018	
136	PCB 136	6	6.22	5.93	0.36		31.50	J	49.1		0.057	
137	PCB 137	6	6.83	6.54	0.36		22.70	U				
139	PCBs 139 + 140	6	6.67	6.38	0.36		21.80	U				
141	PCB 141	6	6.82	6.53	0.36		24.20	U				
142	PCB 142	6	6.51	6.22	0.36		27.40	U				
143	PCB 143	6	6.60	6.31	0.36		26.40	U				
144	PCB 144	6	6.67	6.38	0.36		25.20	U				
145	PCB 145	6	6.25	5.96	0.36		16.30	U				
146	PCB 146	6	6.89	6.60	0.36		20.60	U				
147	PCBs 147 + 149	6	6.66	6.37	0.36		160.00	J	249.4		0.107	
148	PCB 148	6	6.73	6.44	0.36		25.90	U				
150	PCB 150	6	6.32	6.03	0.36		16.90	U				
151	PCB 151	6	6.64	6.35	0.36		90.60	J	141.2		0.063	
152	PCB 152	6	6.22	5.93	0.36		18.70	U				
153	PCBs 153 + 168	6	7.03	6.74	0.36				0.0		0.000	
155	PCB 155	6	6.41	6.12	0.36		15.70	U				
156	PCBs 156 + 157	6	7.18	6.89	0.36		30.20	U				
158	PCB 158	6	7.02	6.73	0.36		348.00		542.5		0.100	
159	PCB 159	6	7.24	6.95	0.36		18.70	U				
160	PCB 160	6	6.93	6.64	0.36		11.10	U				
161	PCB 161	6	7.08	6.79	0.36		18.90	U				
162	PCB 162	6	7.24	6.95	0.36		17.60	U				
164	PCB 164	6	7.02	6.73	0.36		18.30	U				
165	PCB 165	6	7.05	6.76	0.36		18.00	U				
166	PCB 166	6	6.93	6.64	0.36		18.20	U				
167	PCB 167	6	7.27	6.98	0.36		16.30	U				
169	PCB 169	6	7.42	7.13	0.36		15.40	U				
170	PCB 170	7	7.27	6.98	0.36		78.00	J	121.6		0.013	
171	PCBs 171 + 173	7	7.07	6.78	0.36		23.70	U				
172	PCB 172	7	7.33	7.04	0.36		23.10	U				
174	PCB 174	7	7.11	6.82	0.36		54.70	J	85.3		0.013	
175	PCB 175	7	7.17	6.88	0.36		23.60	U				
176	PCB 176	7	6.76	6.47	0.36		17.00	U				
177	PCB 177	7	7.08	6.79	0.36		34.90	J	54.4		0.009	
178	PCB 178	7	7.14	6.85	0.36							
179	PCB 179	7	6.73	6.44	0.36		17.20	U				
180	PCBs 180 + 193	7	7.45	7.16	0.36		87.80	J	136.9		0.009	
181	PCB 181	7	7.11	6.82	0.36		18.90	U				
182	PCB 182	7	7.20	6.91	0.36		21.70	U				
183	PCB 183	7	7.20	6.91	0.36		24.00	J	37.4		0.005	
184	PCB 184	7	6.85	6.56	0.36		15.50	U				

PW006 Porewater Calculations. ALS Data

Low Load PRCs

Performance Reference Compounds				PW006 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	17700	1480	0.08	0.92
PCB 54	4	4.923	8.38E+04	16200	172	0.01	0.99
PCB 47	4	5.563	3.66E+05	15300	4720	0.31	0.69
PCB 97	5	6.003	1.01E+06	20600	8760	0.43	0.57
PCB 111	5	6.473	2.97E+06	30200	12000	0.40	0.60
PCB 153	6	6.633	4.30E+06	31800	11900	0.37	0.63
PCB 178	7	6.853	7.13E+06	32000	9190	0.29	0.71

Average of 28 and 54 Kpew <5.5	0.05
Average of 97, 111, 153 and 178 Kpew >5.5	0.36



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
185	PCB 185	7	7.11	6.82	0.36		20.20	U				
186	PCB 186	7	6.69	6.40	0.36		16.40	U				
187	PCB 187	7	7.17	6.88	0.36		58.50	J	91.2		0.012	
188	PCB 188	7	6.82	6.53	0.36		20.50	U				
189	PCB 189	7	7.71	7.42	0.36		15.70	U				
190	PCB 190	7	7.46	7.17	0.36		15.40	U				
191	PCB 191	7	7.55	7.26	0.36		17.70	U				
192	PCB 192	7	7.52	7.23	0.36		16.80	U				
194	PCB 194	8	7.80	7.51	0.36		30.90	J	48.2		0.0015	
195	PCB 195	8	7.56	7.27	0.36		20.40	U				
196	PCB 196	8	7.65	7.36	0.36		20.00	U				
197	PCB 197	8	7.30	7.01	0.36		12.9	U				
198	PCBs 198 + 199	8	7.46	7.17	0.36		19.2	U				
200	PCB 200	8	7.27	6.98	0.36		14.1	U				
201	PCB 201	8	7.62	7.33	0.36		13.8	U				
202	PCB 202	8	7.24	6.95	0.36		14.6	U				
203	PCB 203	8	7.65	7.36	0.36		17.2	U				
204	PCB 204	8	7.30	7.01	0.36		13.8	U				
205	PCB 205	8	8.00	7.71	0.36		17.3	U				
206	PCB 206	9	8.09	7.80	0.36		33.3	U				
207	PCB 207	9	7.74	7.45	0.36		13.5	U				
208	PCB 208	9	7.71	7.42	0.36		11.8	U				
209	PCB 209	10	8.18	7.89	0.36		17.9	U				
`							**Sum**				**3.47**	

Performance Reference Compounds

PRCs not included in porewater calculations

Note: If the percent lost = 1.0, substituted 0.99 to fit the equation

PW007 Porewater Calculations. ALS Data

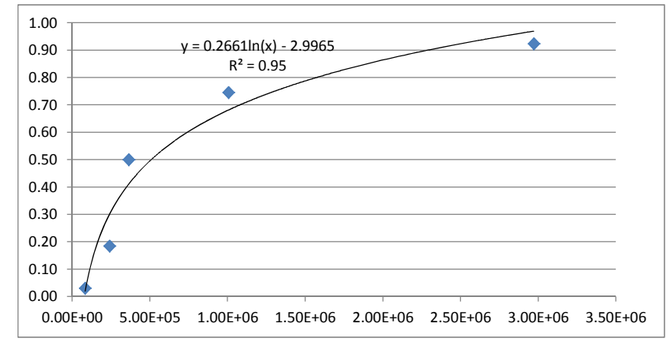
Low Load PRCs

Performance Reference Compounds				PW007 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	618	114	0.18	0.82
PCB 54	4	4.923	8.38E+04	556	17	0.03	0.97
PCB 47	4	5.563	3.66E+05	522	261	0.50	0.50
PCB 97	5	6.003	1.01E+06	729	543	0.74	0.26
PCB 111	5	6.473	2.97E+06	987	911	0.92	0.08
PCB 153	6	6.633	4.30E+06	1020	896	0.88	0.12
PCB 178	7	6.853	7.13E+06	966	879	0.91	0.09

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.18	0.30	-0.12
PCB 54	0.03	0.02	0.01
PCB 47	0.50	0.41	0.09
PCB 97	0.74	0.68	0.06
PCB 111	0.92	0.97	-0.05
PCB 153	0.88	1.07	-0.19



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
1	PCB 1	1	4.46	4.17	0.00		0.13	U				
2	PCB 2	1	4.69	4.40	0.00		0.01		0.0		0.0005	
3	PCB 3	1	4.69	4.40	0.00		0.02	U				
4	PCB 4	2	4.65	4.36	0.00		4.07	U				
5	PCB 5	2	4.97	4.68	0.00		0.01	U				
6	PCB 6	2	5.06	4.77	0.00		0.05	U				
7	PCB 7	2	5.07	4.78	0.00		0.01	U				
8	PCB 8	2	5.07	4.78	0.00		0.12	U				
9	PCB 9	2	5.06	4.77	0.00		0.02	J	0.0		0.0003	
10	PCB 10	2	4.84	4.55	0.00		0.29	U				
11	PCB 11	2	5.28	4.99	0.00		0.62	J	0.6		0.0063	
12	PCBs 12 + 13	2	5.26	4.97	0.00		0.05		0.1		0.0005	
14	PCB 14	2	5.28	4.99	0.00		0.01	U				
15	PCB 15	2	5.30	5.01	0.00		0.19	U				
16	PCB 16	3	5.16	4.87	0.00		0.03	J	0.0		0.0005	
17	PCB 17	3	5.25	4.96	0.00		0.79	U				
18	PCB 18	3	5.24	4.95	0.00		0.07	U				
19	PCB 19	3	5.02	4.73	0.00		4.37	U				
20	PCBs 20 + 28	3	5.62	5.34	0.00							
21	PCBs 21 + 33	3	5.56	5.27	0.00		0.05	U				
22	PCB 22	3	5.58	5.29	0.00		0.05	U				
23	PCB 23	3	5.57	5.28	0.00		0.05		0.1		0.0003	
24	PCB 24	3	5.35	5.06	0.00		0.01	U				
25	PCB 25	3	5.67	5.38	0.00		0.21	J	0.2		0.0009	
26	PCBs 26 + 29	3	5.63	5.34	0.00		0.05	U				
27	PCB 27	3	5.44	5.15	0.00		0.60	U				
30	PCB 30	3	5.15	5.15	0.00		0.31	U				
31	PCB 31	3	5.38	5.38	0.00		0.34	J	0.3		0.0014	
32	PCB 32	3	5.15	5.15	0.00		0.31	U				
34	PCB 34	3	5.37	5.37	0.00		0.05	U				
35	PCB 35	3	5.53	5.53	0.39		0.05	U				
36	PCB 36	3	5.59	5.59	0.43		0.05		0.1		0.0002	
37	PCB 37	3	5.54	5.54	0.40		0.06	U				
38	PCB 38	3	5.47	5.47	0.36		0.05	U				
39	PCB 39	3	5.60	5.60	0.44		0.04	U				
40	PCBs 40 + 71	4	5.85	5.56	0.41		0.02	U				
41	PCB 41	4	5.40	5.40	0.31		0.03	U				
42	PCB 42	4	5.47	5.47	0.36		0.02	U				
43	PCBs 43 + 73	4	5.92	5.63	0.45		0.02	U				
44	PCBs 44 + 47 + 65	4	5.82	5.54	0.40							
45	PCBs 45 + 51	4	5.58	5.30	0.00		0.96	U				
46	PCB 46	4	5.53	5.24	0.00		0.03		0.0		0.0002	
48	PCB 48	4	5.78	5.49	0.37		0.02	U				
49	PCB 49	4	5.85	5.56	0.41		4.49	J	7.6		0.0209	
50	PCBs 50 + 53	4	5.63	5.34	0.00		1.39	U				
52	PCB 52	4	5.84	5.55	0.41		2.74	U				
54	PCB 54	4	5.21	4.92	0.00							
55	PCB 55	4	6.11	5.82	0.57		0.02	U				
56	PCB 56	4	6.11	5.82	0.57		0.69		1.6		0.0024	
57	PCB 57	4	6.17	5.88	0.61		0.02	U				
58	PCB 58	4	6.17	5.88	0.61		0.02	U				
59	PCBs 59 + 62 + 75	4	5.97	5.68	0.48		0.02		0.0		0.0001	
60	PCB 60	4	6.11	5.82	0.57		0.09	J	0.2		0.0003	
61	PCB 61	4	6.04	5.75	0.53		0.02	U				

PW007 Porewater Calculations. ALS Data

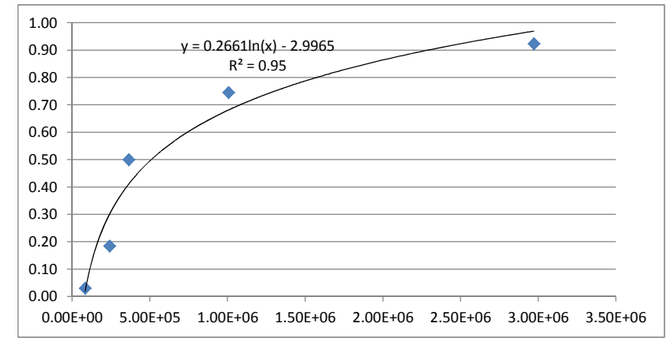
Low Load PRCs

Performance Reference Compounds				PW007 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	618	114	0.18	0.82
PCB 54	4	4.923	8.38E+04	556	17	0.03	0.97
PCB 47	4	5.563	3.66E+05	522	261	0.50	0.50
PCB 97	5	6.003	1.01E+06	729	543	0.74	0.26
PCB 111	5	6.473	2.97E+06	987	911	0.92	0.08
PCB 153	6	6.633	4.30E+06	1020	896	0.88	0.12
PCB 178	7	6.853	7.13E+06	966	879	0.91	0.09

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.18	0.30	-0.12
PCB 54	0.03	0.02	0.01
PCB 47	0.50	0.41	0.09
PCB 97	0.74	0.68	0.06
PCB 111	0.92	0.97	-0.05
PCB 153	0.88	1.07	-0.19



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
62	PCB 63	4	6.17	5.88	0.61		0.02	U				
64	PCB 64	4	5.95	5.66	0.47		0.02	U				
66	PCB 66	4	6.20	5.91	0.63		0.02	U				
67	PCB 67	4	6.20	5.91	0.63		0.02	U				
68	PCB 68	4	6.26	5.97	0.66		0.02	U				
69	PCB 69	4	6.04	5.75	0.53		0.02	U				
70	PCBs 70 + 74 + 76	4	6.18	5.89	0.61		1.10		2.8		0.0037	
72	PCB 72	4	6.26	5.97	0.66		0.02		0.1		0.0001	
77	PCB 77	4	6.36	6.07	0.72		0.02	U				
78	PCB 78	4	6.35	6.06	0.72		0.02	U				
79	PCB 79	4	6.42	6.13	0.76		14.50		60.8		0.0447	
80	PCB 80	4	6.48	6.19	0.80		0.03	J	0.2		0.0001	
81	PCB 81	4	6.36	6.07	0.72		0.02	U				
82	PCB 82	5	6.20	5.91	0.63		0.03	U				
83	PCBs 83 + 99	5	6.33	6.04	0.71		0.02	U				
84	PCB 84	5	6.04	5.75	0.53		0.66	J	1.4		0.0025	
85	PCB 85	5	6.30	6.01	0.69		0.02	U				
86	PCBs 86 + 87 + 97 + 109 + 119 + 125	5	6.42	6.13	0.76							
88	PCB 88	5	6.07	5.78	0.55		0.02	U				
89	PCB 89	5	6.07	5.78	0.55		0.02	U				
90	PCBs 90 + 101 + 113	5	6.43	6.15	0.77		0.02	U				
91	PCB 91	5	6.13	5.84	0.58		1.05	U				
92	PCB 92	5	6.35	6.06	0.72		0.02	U				
93	PCB 93	5	6.04	5.75	0.53		0.02	U				
94	PCB 94	5	6.13	5.84	0.58		0.16	U				
95	PCBs 95 + 100	5	6.18	5.90	0.62		4.06	J	10.6		0.0134	
96	PCB 96	5	5.71	5.42	0.33		0.23	J	0.3		0.0013	
98	PCBs 98 + 102	5	6.15	5.86	0.59		0.23	U				
103	PCB 103	5	6.22	5.93	0.64		0.39	U				
104	PCB 104	5	5.81	5.52	0.39		0.20	J	0.3		0.0010	
105	PCB 105	5	6.65	6.36	0.90		0.59	0	6.0		0.0026	
106	PCB 106	5	6.64	6.35	0.90		0.09	U				
107	PCB 107	5	6.71	6.42	0.94		0.27	J	4.4		0.0017	
108	PCBs 108 + 124	5	6.72	6.43	0.95		0.08	U				
110	PCBs 110 + 115	5	6.49	6.20	0.80		0.02	U				
111	PCB 111	5	6.76	6.47	0.97							
112	PCB 112	5	6.45	6.16	0.78		0.02	U				
114	PCB 114	5	6.65	6.36	0.90		0.08		0.8		0.0003	
117	PCBs 117 + 116	5	6.40	6.11	0.75		0.02	U				
118	PCB 118	5	6.74	6.45	0.96		1.94	U				
120	PCB 120	5	6.79	6.50	0.99		0.02	U				
121	PCB 121	5	6.64	6.35	0.90		0.02	U				
122	PCB 122	5	6.64	6.35	0.90		0.08	U				
123	PCB 123	5	6.74	6.45	0.96		0.08	U				
126	PCB 126	5	6.89	6.60	0.99		0.07	J	6.5		0.0016	
127	PCB 127	5	6.95	6.66	0.99		0.08	U				
128	PCB 128	6	6.74	6.45	0.96		0.05	J	1.3		0.0005	
129	PCBs 129 + 138 + 163	6	6.86	6.58	1.03		7.21	U				
130	PCB 130	6	6.80	6.51	0.99		0.07	U				
131	PCB 131	6	6.58	6.29	0.86		0.05	U				
132	PCB 132	6	6.58	6.29	0.86		0.06	U				
133	PCB 133	6	6.86	6.57	1.03		0.06	U				
134	PCB 134	6	6.55	6.26	0.84		0.05	U				

PW007 Porewater Calculations. ALS Data

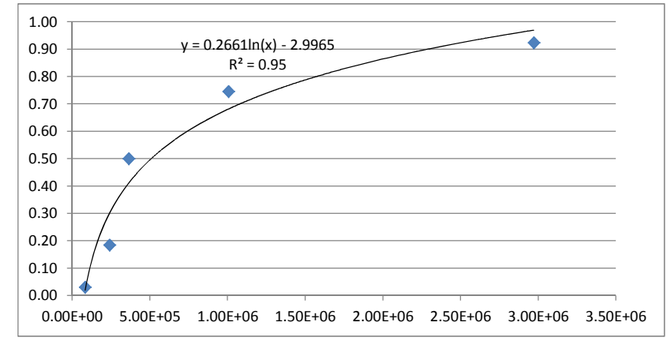
Low Load PRCs

Performance Reference Compounds				PW007 Water			
Compound	Chlorines	logKpew	Kpew	T=0 pg/g	Time Final pg/g	% Remaining	% Loss
PCB 28	3	5.383	2.42E+05	618	114	0.18	0.82
PCB 54	4	4.923	8.38E+04	556	17	0.03	0.97
PCB 47	4	5.563	3.66E+05	522	261	0.50	0.50
PCB 97	5	6.003	1.01E+06	729	543	0.74	0.26
PCB 111	5	6.473	2.97E+06	987	911	0.92	0.08
PCB 153	6	6.633	4.30E+06	1020	896	0.88	0.12
PCB 178	7	6.853	7.13E+06	966	879	0.91	0.09

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.18	0.30	-0.12
PCB 54	0.03	0.02	0.01
PCB 47	0.50	0.41	0.09
PCB 97	0.74	0.68	0.06
PCB 111	0.92	0.97	-0.05
PCB 153	0.88	1.07	-0.19



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	Target Analytes (ng/g PE)	Chlorines	log Kow	logKpew	% Remaining		PE Conc. (ng/g)		PRC Corrected (ng/g)		Water Conc. (ng/L)	
135	PCBs 135 + 154	6	6.70	6.42	0.94		1.11	J	17.2		0.0066	
136	PCB 136	6	6.22	5.93	0.64		1.32	J	3.7		0.0043	
137	PCB 137	6	6.83	6.54	0.99		0.05	U				
139	PCBs 139 + 140	6	6.67	6.38	0.91		0.05	U				
141	PCB 141	6	6.82	6.53	0.99		0.06	U				
142	PCB 142	6	6.51	6.22	0.82		0.06	U				
143	PCB 143	6	6.60	6.31	0.87		0.06	U				
144	PCB 144	6	6.67	6.38	0.91		0.36	J	4.2		0.0017	
145	PCB 145	6	6.25	5.96	0.66		0.01	U				
146	PCB 146	6	6.89	6.60	0.99		0.05	U				
147	PCBs 147 + 149	6	6.66	6.37	0.91		5.69	U				
148	PCB 148	6	6.73	6.44	0.95		0.02	U				
150	PCB 150	6	6.32	6.03	0.70		0.06	U				
151	PCB 151	6	6.64	6.35	0.90		3.22	J	31.0		0.0138	
152	PCB 152	6	6.22	5.93	0.64		0.04	U				
153	PCBs 153 + 168	6	7.03	6.74	0.99							
155	PCB 155	6	6.41	6.12	0.76		0.01	U				
156	PCBs 156 + 157	6	7.18	6.89	0.99		0.52	U				
158	PCB 158	6	7.02	6.73	0.99		27.30		2730.0		0.5049	
159	PCB 159	6	7.24	6.95	0.99		0.09	U				
160	PCB 160	6	6.93	6.64	0.99		0.03	U				
161	PCB 161	6	7.08	6.79	0.99		0.04	U				
162	PCB 162	6	7.24	6.95	0.99		0.04	U				
164	PCB 164	6	7.02	6.73	0.99		0.04	U				
165	PCB 165	6	7.05	6.76	0.99		0.04	U				
166	PCB 166	6	6.93	6.64	0.99		0.04	U				
167	PCB 167	6	7.27	6.98	0.99		0.21	U				
169	PCB 169	6	7.42	7.13	0.99		0.04	U				
170	PCB 170	7	7.27	6.98	0.99		3.10	U				
171	PCBs 171 + 173	7	7.07	6.78	0.99		0.97	U				
172	PCB 172	7	7.33	7.04	0.99		0.49	U				
174	PCB 174	7	7.11	6.82	0.99		2.93	U				
175	PCB 175	7	7.17	6.88	0.99		0.02	U				
176	PCB 176	7	6.76	6.47	0.97		0.01	U				
177	PCB 177	7	7.08	6.79	0.99		1.85	U				
178	PCB 178	7	7.14	6.85	0.99							
179	PCB 179	7	6.73	6.44	0.95		0.01	U				
180	PCBs 180 + 193	7	7.45	7.16	0.99		6.34	U				
181	PCB 181	7	7.11	6.82	0.99		0.04	U				
182	PCB 182	7	7.20	6.91	0.99		0.02	U				
183	PCB 183	7	7.20	6.91	0.99		1.49	U				
184	PCB 184	7	6.85	6.56	0.99		0.01	U				
185	PCB 185	7	7.11	6.82	0.99		0.29	J	29.0		0.0044	
186	PCB 186	7	6.69	6.40	0.93		0.01	U				
187	PCB 187	7	7.17	6.88	0.99		2.98	U				
188	PCB 188	7	6.82	6.53	0.99		0.01	U				
189	PCB 189	7	7.71	7.42	0.99		0.11	U				
190	PCB 190	7	7.46	7.17	0.99		0.71	U				
191	PCB 191	7	7.55	7.26	0.99		0.13	U				
192	PCB 192	7	7.52	7.23	0.99		0.04	U				
194	PCB 194	8	7.80	7.51	0.99		1.41	U				
195	PCB 195	8	7.56	7.27	0.99		0.58	U				
196	PCB 196	8	7.65	7.36	0.99		0.83	U				
197	PCB 197	8	7.30	7.01	0.99		0.0554	U				

PW007 Porewater Calculations. ALS Data

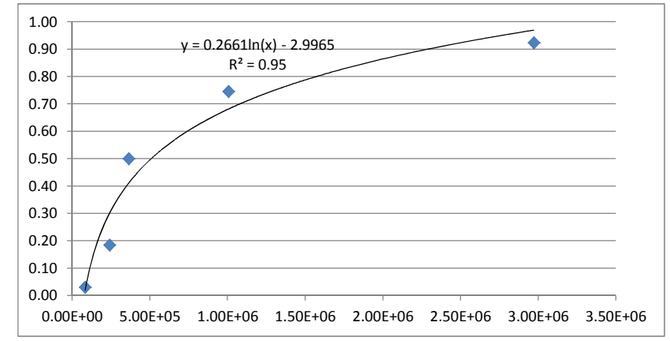
Low Load PRCs

Performance Reference Compounds				PW007 Water			
Compound	**Chlorines**	**logKpew**	**Kpew**	**T=0 pg/g**	**Time Final pg/g**	**% Remaining**	**% Loss**
PCB 28	3	5.383	2.42E+05	618	114	0.18	0.82
PCB 54	4	4.923	8.38E+04	556	17	0.03	0.97
PCB 47	4	5.563	3.66E+05	522	261	0.50	0.50
PCB 97	5	6.003	1.01E+06	729	543	0.74	0.26
PCB 111	5	6.473	2.97E+06	987	911	0.92	0.08
PCB 153	6	6.633	4.30E+06	1020	896	0.88	0.12
PCB 178	7	6.853	7.13E+06	966	879	0.91	0.09

Applied logarithmic model to the data as linear regression resulted in negative values

Values predicted by the equation are within 20% of the observed % remaining

	Observed	Predicted	Difference
PCB 28	0.18	0.30	-0.12
PCB 54	0.03	0.02	0.01
PCB 47	0.50	0.41	0.09
PCB 97	0.74	0.68	0.06
PCB 111	0.92	0.97	-0.05
PCB 153	0.88	1.07	-0.19



Analytes and Partitioning Coefficients					Water Column							
IUPAC Sort	**Target Analytes (ng/g PE)**	**Chlorines**	**log Kow**	**logKpew**	**% Remaining**		**PE Conc. (ng/g)**		**PRC Corrected (ng/g)**		**Water Conc. (ng/L)**	
198	PCBs 198 + 199	8	7.46	7.17	0.99		1.47	J	147.0		0.0099	
200	PCB 200	8	7.27	6.98	0.99		0.16	U				
201	PCB 201	8	7.62	7.33	0.99		0.158	U				
202	PCB 202	8	7.24	6.95	0.99		0.374	J	37.4		0.0042	
203	PCB 203	8	7.65	7.36	0.99		0.757	U				
204	PCB 204	8	7.30	7.01	0.99		0.0136	U				
205	PCB 205	8	8.00	7.71	0.99		0.0672	U				
206	PCB 206	9	8.09	7.80	0.99		0.283	U				
207	PCB 207	9	7.74	7.45	0.99		0.0402	U				
208	PCB 208	9	7.71	7.42	0.99		0.0587	U				
209	PCB 209	10	8.18	7.89	0.99		0.0429	U				

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Sum **0.66**

Note: If the percent lost = 1.0, substituted 0.99 to fit the equation

Performance Reference Compounds

PRCs not included in porewater calculations

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow	logKow	logKpew	log Koc (95% CR)	
			Ruelle	Hawker	Fernandez	Hansen	
2051-60-7	1	2-Chlorobiphenyl		4.46	4.17	4.4	(0.31)
2051-61-8	2	3-Chlorobiphenyl		4.69	4.40	4.51	(0.30)
2051-62-9	3	4-Chlorobiphenyl		4.69	4.40	4.52	(0.30)
13029-08-8	4	2,2'-Dichlorobiphenyl		4.65	4.36	4.40	(0.31)
16605-91-7	5	2,3-Dichlorobiphenyl		4.97	4.68	4.72	(0.30)
25569-80-6	6	2,3'-Dichlorobiphenyl		5.06	4.77	4.71	(0.30)
33284-50-3	7	2,4-Dichlorobiphenyl		5.07	4.78	4.67	(0.30)
34883-43-7	8	2,4'-Dichlorobiphenyl		5.07	4.78	4.72	(0.30)
34883-39-1	9	2,5-Dichlorobiphenyl		5.06	4.77	4.67	(0.30)
33146-45-1	10	2,6-Dichlorobiphenyl		4.84	4.55	4.40	(0.31)
2050-67-1	11	3,3'-Dichlorobiphenyl		5.28	4.99	4.84	(0.29)
2974-92-7	12	3,4-Dichlorobiphenyl		5.22	4.93	4.86	(0.29)
2974-90-5	13	3,4'-Dichlorobiphenyl		5.29	5.00	4.86	(0.29)
34883-41-5	14	3,5-Dichlorobiphenyl		5.28	4.99	4.77	(0.29)
2050-68-2	15	4,4'-Dichlorobiphenyl		5.30	5.01	4.88	(0.29)
38444-78-9	16	2,2',3-Trichlorobiphenyl		5.16	4.87	4.88	(0.29)
37680-66-3	17	2,2',4-Trichlorobiphenyl		5.25	4.96	4.80	(0.29)
37680-65-2	18	2,2',5-Trichlorobiphenyl		5.24	4.95	4.79	(0.29)
38444-73-4	19	2,2',6-Trichlorobiphenyl		5.02	4.73	4.67	(0.30)
38444-84-7	20	2,3,3'-Trichlorobiphenyl		5.57	5.28	5.08	(0.29)
55702-46-0	21	2,3,4-Trichlorobiphenyl		5.51	5.22	5.07	(0.29)
38444-85-8	22	2,3,4'-Trichlorobiphenyl		5.58	5.29	5.11	(0.29)
55720-44-0	23	2,3,5-Trichlorobiphenyl		5.57	5.28	4.98	(0.29)
55702-45-9	24	2,3,6-Trichlorobiphenyl		5.35	5.06	4.84	(0.29)
55712-37-3	25	2,3',4-Trichlorobiphenyl		5.67	5.38	5.02	(0.29)
38444-81-4	26	2,3',5-Trichlorobiphenyl		5.66	5.37	5.02	(0.29)
38444-76-7	27	2,3',6-Trichlorobiphenyl		5.44	5.15	4.79	(0.29)
7012-37-5	28	2,4,4'-Trichlorobiphenyl		5.67	5.383	5.05	(0.29)
15862-07-4	29	2,4,5-Trichlorobiphenyl		5.60	5.31	4.99	(0.29)
35693-92-6	30	2,4,6-Trichlorobiphenyl		5.44	5.15	4.72	(0.30)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow Ruelle	logKow Hawker	logKpew Fernandez	log Koc (95% CR) Hansen	
16606-02-3	31	2,4',5-Trichlorobiphenyl		5.67	5.38	5.04	(0.29)
38444-77-8	32	2,4',6-Trichlorobiphenyl		5.44	5.15	4.88	(0.29)
38444-86-9	33	2,3',4'-Trichlorobiphenyl		5.60	5.31	5.08	(0.29)
37680-68-5	34	2,3',5'-Trichlorobiphenyl		5.66	5.37	4.98	(0.29)
37680-69-6	35	3,3',4-Trichlorobiphenyl		5.82	5.53	5.23	(0.29)
38444-87-0	36	3,3',5-Trichlorobiphenyl		5.88	5.59	5.15	(0.29)
38444-90-5	37	3,4,4'-Trichlorobiphenyl		5.83	5.54	5.26	(0.29)
53555-66-1	38	3,4,5-Trichlorobiphenyl		5.76	5.47	5.19	(0.29)
38444-88-1	39	3,4',5-Trichlorobiphenyl		5.89	5.60	5.16	(0.29)
38444-93-8	40	2,2',3,3'-Tetrachlorobiphenyl		5.66	5.37	5.39	(0.29)
52663-59-9	41	2,2',3,4-Tetrachlorobiphenyl		5.69	5.40	5.35	(0.29)
36559-22-5	42	2,2',3,4'-Tetrachlorobiphenyl		5.76	5.47	5.31	(0.29)
70362-46-8	43	2,2',3,5-Tetrachlorobiphenyl		5.75	5.46	5.21	(0.29)
41464-39-5	44	2,2',3,5'-Tetrachlorobiphenyl		5.75	5.46	5.30	(0.29)
70362-45-7	45	2,2',3,6-Tetrachlorobiphenyl		5.53	5.24	5.12	(0.29)
41464-47-5	46	2,2',3,6'-Tetrachlorobiphenyl		5.53	5.24	5.16	(0.29)
2437-79-8	47	2,2',4,4'-Tetrachlorobiphenyl		5.85	5.563	5.23	(0.29)
70362-47-9	48	2,2',4,5-Tetrachlorobiphenyl		5.78	5.49	5.23	(0.29)
41464-40-8	49	2,2',4,5'-Tetrachlorobiphenyl		5.85	5.56	5.22	(0.29)
62796-65-0	50	2,2',4,6-Tetrachlorobiphenyl		5.63	5.34	5.01	(0.29)
68194-04-7	51	2,2',4,6'-Tetrachlorobiphenyl		5.63	5.34	5.09	(0.29)
35693-99-3	52	2,2',5,5'-Tetrachlorobiphenyl		5.84	5.55	5.20	(0.29)
41464-41-9	53	2,2',5,6'-Tetrachlorobiphenyl		5.62	5.33	5.07	(0.29)
15968-05-5	54	2,2',6,6'-Tetrachlorobiphenyl		5.21	4.92	4.94	(0.29)
74338-24-2	55	2,3,3',4-Tetrachlorobiphenyl		6.11	5.82	5.44	(0.29)
41464-43-1	56	2,3,3',4'-Tetrachlorobiphenyl		6.11	5.82	5.47	(0.29)
70424-67-8	57	2,3,3',5-Tetrachlorobiphenyl		6.17	5.88	5.34	(0.29)
41464-49-7	58	2,3,3',5'-Tetrachlorobiphenyl		6.17	5.88	5.37	(0.29)
74472-33-6	59	2,3,3',6-Tetrachlorobiphenyl		5.95	5.66	5.31	(0.29)
33025-41-1	60	2,3,4,4'-Tetrachlorobiphenyl		6.11	5.82	5.47	(0.29)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow	logKow	logKpew	log Koc (95% CR)	
			Ruelle	Hawker	Fernandez	Hansen	
33284-53-6	61	2,3,4,5-Tetrachlorobiphenyl		6.04	5.75	5.38	(0.29)
54230-22-7	62	2,3,4,6-Tetrachlorobiphenyl		5.89	5.60	5.25	(0.29)
74472-34-7	63	2,3,4',5-Tetrachlorobiphenyl		6.17	5.88	5.37	(0.29)
52663-58-8	64	2,3,4',6-Tetrachlorobiphenyl		5.95	5.66	5.36	(0.29)
33284-54-7	65	2,3,5,6-Tetrachlorobiphenyl		5.86	5.57	5.24	(0.29)
32598-10-0	66	2,3',4,4'-Tetrachlorobiphenyl		6.20	5.91	5.41	(0.29)
73575-53-8	67	2,3',4,5-Tetrachlorobiphenyl		6.20	5.91	5.35	(0.29)
73575-52-7	68	2,3',4,5'-Tetrachlorobiphenyl		6.26	5.97	5.31	(0.29)
60233-24-1	69	2,3',4,6-Tetrachlorobiphenyl		6.04	5.75	5.19	(0.29)
32598-11-1	70	2,3',4',5-Tetrachlorobiphenyl		6.20	5.91	5.40	(0.29)
41464-46-4	71	2,3',4',6-Tetrachlorobiphenyl		5.98	5.69	5.35	(0.29)
41464-42-0	72	2,3',5,5'-Tetrachlorobiphenyl		6.26	5.97	5.29	(0.29)
74338-23-1	73	2,3',5',6-Tetrachlorobiphenyl		6.04	5.75	5.20	(0.29)
32690-93-0	74	2,4,4',5-Tetrachlorobiphenyl		6.20	5.91	5.39	(0.29)
32598-12-2	75	2,4,4',6-Tetrachlorobiphenyl		6.05	5.76	5.23	(0.29)
70362-48-0	76	2,3',4',5'-Tetrachlorobiphenyl		6.13	5.84	5.40	(0.29)
32598-13-3	77	3,3',4,4'-Tetrachlorobiphenyl		6.36	6.07	5.63	(0.29)
70362-49-1	78	3,3',4,5-Tetrachlorobiphenyl		6.35	6.06	5.56	(0.29)
41464-48-6	79	3,3',4,5'-Tetrachlorobiphenyl		6.42	6.13	5.53	(0.29)
33284-52-5	80	3,3',5,5'-Tetrachlorobiphenyl		6.48	6.19	5.42	(0.29)
70362-50-4	81	3,4,4',5-Tetrachlorobiphenyl		6.36	6.07	5.59	(0.29)
52663-62-4	82	2,2',3,3',4-Pentachlorobiphenyl		6.20	5.91	5.86	(0.29)
60145-20-2	83	2,2',3,3',5-Pentachlorobiphenyl		6.26	5.97	5.71	(0.29)
52663-60-2	84	2,2',3,3',6-Pentachlorobiphenyl		6.04	5.75	5.61	(0.29)
65510-45-4	85	2,2',3,4,4'-Pentachlorobiphenyl		6.30	6.01	5.78	(0.29)
55312-69-1	86	2,2',3,4,5-Pentachlorobiphenyl		6.23	5.94	5.74	(0.29)
38380-02-8	87	2,2',3,4,5'-Pentachlorobiphenyl		6.29	6.00	5.76	(0.29)
55215-17-3	88	2,2',3,4,6-Pentachlorobiphenyl		6.07	5.78	5.53	(0.29)
73575-57-2	89	2,2',3,4,6'-Pentachlorobiphenyl		6.07	5.78	5.63	(0.29)
68194-07-0	90	2,2',3,4',5-Pentachlorobiphenyl		6.36	6.07	5.64	(0.29)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow Ruelle	logKow Hawker	logKpew Fernandez	log Koc (95% CR) Hansen	
68194-05-8	91	2,2',3,4',6-Pentachlorobiphenyl		6.13	5.84	5.55	(0.29)
52663-61-3	92	2,2',3,5,5'-Pentachlorobiphenyl		6.35	6.06	5.61	(0.29)
73575-56-1	93	2,2',3,5,6-Pentachlorobiphenyl		6.04	5.75	5.51	(0.29)
73575-55-0	94	2,2',3,5,6'-Pentachlorobiphenyl		6.13	5.84	5.47	(0.29)
38379-99-6	95	2,2',3,5',6-Pentachlorobiphenyl		6.13	5.84	5.52	(0.29)
73575-54-9	96	2,2',3,6,6'-Pentachlorobiphenyl		5.71	5.42	5.38	(0.29)
41464-51-1	97	2,2',3,4',5'-Pentachlorobiphenyl		6.29	6.00	5.74	(0.29)
60233-25-2	98	2,2',3,4',6'-Pentachlorobiphenyl		6.13	5.84	5.50	(0.29)
38380-01-7	99	2,2',4,4',5-Pentachlorobiphenyl		6.39	6.10	5.66	(0.29)
39485-83-1	100	2,2',4,4',6-Pentachlorobiphenyl		6.23	5.94	5.43	(0.29)
37680-73-2	101	2,2',4,5,5'-Pentachlorobiphenyl		6.38	6.09	5.64	(0.29)
68194-06-9	102	2,2',4,5,6'-Pentachlorobiphenyl		6.16	5.87	5.51	(0.29)
60145-21-3	103	2,2',4,5',6-Pentachlorobiphenyl		6.22	5.93	5.41	(0.29)
56558-16-8	104	2,2',4,6,6'-Pentachlorobiphenyl		5.81	5.52	5.27	(0.29)
32598-14-4	105	2,3,3',4,4'-Pentachlorobiphenyl		6.65	6.36	5.83	(0.30)
70424-69-0	106	2,3,3',4,5-Pentachlorobiphenyl		6.64	6.35	5.73	(0.30)
70424-68-9	107	2,3,3',4',5-Pentachlorobiphenyl		6.71	6.42	5.72	(0.30)
70362-41-3	108	2,3,3',4,5'-Pentachlorobiphenyl		6.71	6.42	5.72	(0.30)
74472-35-8	109	2,3,3',4,6-Pentachlorobiphenyl		6.48	6.19	5.71	(0.29)
38380-03-9	110	2,3,3',4',6-Pentachlorobiphenyl		6.48	6.19	5.81	(0.29)
39635-32-0	111	2,3,3',5,5'-Pentachlorobiphenyl		6.76	6.473	5.60	(0.29)
74472-36-9	112	2,3,3',5,6-Pentachlorobiphenyl		6.45	6.16	5.70	(0.29)
68194-10-5	113	2,3,3',5',6-Pentachlorobiphenyl		6.54	6.25	5.66	(0.29)
74472-37-0	114	2,3,4,4',5-Pentachlorobiphenyl		6.65	6.36	5.77	(0.30)
74472-38-1	115	2,3,4,4',6-Pentachlorobiphenyl		6.49	6.20	5.76	(0.29)
18259-05-7	116	2,3,4,5,6-Pentachlorobiphenyl		6.33	6.04	5.75	(0.29)
68194-11-6	117	2,3,4',5,6-Pentachlorobiphenyl		6.46	6.17	5.76	(0.29)
31508-00-6	118	2,3',4,4',5-Pentachlorobiphenyl		6.74	6.45	5.73	(0.30)
56558-17-9	119	2,3',4,4',6-Pentachlorobiphenyl		6.58	6.29	5.69	(0.29)
68194-12-7	120	2,3',4,5,5'-Pentachlorobiphenyl		6.79	6.50	5.62	(0.29)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow Ruelle	logKow Hawker	logKpew Fernandez	log Koc (95% CR) Hansen	
56558-18-0	121	2,3',4,5',6-Pentachlorobiphenyl		6.64	6.35	5.54	(0.29)
76842-07-4	122	2,3,3',4',5'-Pentachlorobiphenyl		6.64	6.35	5.78	(0.30)
65510-44-3	123	2,3',4,4',5'-Pentachlorobiphenyl		6.74	6.45	5.73	(0.30)
70424-70-3	124	2,3',4',5,5'-Pentachlorobiphenyl		6.73	6.44	5.71	(0.30)
74472-39-2	125	2,3',4',5',6-Pentachlorobiphenyl		6.51	6.22	5.75	(0.29)
57465-28-8	126	3,3',4,4',5-Pentachlorobiphenyl		6.89	6.60	5.95	(0.31)
39635-33-1	127	3,3',4,5,5'-Pentachlorobiphenyl		6.95	6.66	5.83	(0.30)
38380-07-3	128	2,2',3,3',4,4'-Hexachlorobiphenyl		6.74	6.45	6.32	(0.29)
55215-18-4	129	2,2',3,3',4,5-Hexachlorobiphenyl		6.73	6.44	6.23	(0.29)
52663-66-8	130	2,2',3,3',4,5'-Hexachlorobiphenyl		6.80	6.51	6.15	(0.29)
61798-70-7	131	2,2',3,3',4,6-Hexachlorobiphenyl		6.58	6.29	6.00	(0.29)
38380-05-1	132	2,2',3,3',4,6'-Hexachlorobiphenyl		6.58	6.29	6.06	(0.29)
35694-04-3	133	2,2',3,3',5,5'-Hexachlorobiphenyl		6.86	6.57	6.01	(0.29)
52704-70-8	134	2,2',3,3',5,6-Hexachlorobiphenyl		6.55	6.26	5.98	(0.29)
52744-13-5	135	2,2',3,3',5,6'-Hexachlorobiphenyl		6.64	6.35	5.90	(0.29)
38411-22-2	136	2,2',3,3',6,6'-Hexachlorobiphenyl		6.22	5.93	5.79	(0.29)
35694-06-5	137	2,2',3,4,4',5-Hexachlorobiphenyl		6.83	6.54	6.17	(0.29)
35065-28-2	138	2,2',3,4,4',5'-Hexachlorobiphenyl		6.83	6.54	6.19	(0.29)
56030-56-9	139	2,2',3,4,4',6-Hexachlorobiphenyl		6.67	6.38	5.95	(0.29)
59291-64-4	140	2,2',3,4,4',6'-Hexachlorobiphenyl		6.67	6.38	5.95	(0.29)
52712-04-6	141	2,2',3,4,5,5'-Hexachlorobiphenyl		6.82	6.53	6.12	(0.29)
41411-61-4	142	2,2',3,4,5,6-Hexachlorobiphenyl		6.51	6.22	6.00	(0.29)
68194-15-0	143	2,2',3,4,5,6'-Hexachlorobiphenyl		6.60	6.31	5.98	(0.29)
68194-14-9	144	2,2',3,4,5',6-Hexachlorobiphenyl		6.67	6.38	5.90	(0.29)
74472-40-5	145	2,2',3,4,6,6'-Hexachlorobiphenyl		6.25	5.96	5.76	(0.29)
51908-16-8	146	2,2',3,4',5,5'-Hexachlorobiphenyl		6.89	6.60	6.04	(0.29)
68194-13-8	147	2,2',3,4',5,6-Hexachlorobiphenyl		6.64	6.35	5.92	(0.29)
74472-41-6	148	2,2',3,4',5,6'-Hexachlorobiphenyl		6.73	6.44	5.79	(0.29)
38380-04-0	149	2,2',3,4',5',6-Hexachlorobiphenyl		6.67	6.38	5.94	(0.29)
68194-08-1	150	2,2',3,4',6,6'-Hexachlorobiphenyl		6.32	6.03	5.69	(0.29)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow Ruelle	logKow Hawker	logKpew Fernandez	log Koc (95% CR) Hansen	
52663-63-5	151	2,2',3,5,5',6-Hexachlorobiphenyl		6.64	6.35	5.88	(0.29)
68194-09-2	152	2,2',3,5,6,6'-Hexachlorobiphenyl		6.22	5.93	5.73	(0.29)
35065-27-1	153	2,2',4,4',5,5'-Hexachlorobiphenyl		6.92	6.633	6.06	(0.29)
60145-22-4	154	2,2',4,4',5,6'-Hexachlorobiphenyl		6.76	6.47	5.83	(0.29)
33979-03-2	155	2,2',4,4',6,6'-Hexachlorobiphenyl		6.41	6.12	5.59	(0.29)
38380-08-4	156	2,3,3',4,4',5-Hexachlorobiphenyl		7.18	6.89	6.10	(0.32)
69782-90-7	157	2,3,3',4,4',5'-Hexachlorobiphenyl		7.18	6.89	6.12	(0.32)
74472-42-7	158	2,3,3',4,4',6-Hexachlorobiphenyl		7.02	6.73	6.20	(0.29)
39635-35-3	159	2,3,3',4,5,5'-Hexachlorobiphenyl		7.24	6.95	5.98	(0.31)
41411-62-5	160	2,3,3',4,5,6-Hexachlorobiphenyl		6.93	6.64	6.19	(0.29)
74472-43-8	161	2,3,3',4,5',6-Hexachlorobiphenyl		7.08	6.79	6.04	(0.29)
39635-34-2	162	2,3,3',4',5,5'-Hexachlorobiphenyl		7.24	6.95	6.00	(0.31)
74472-44-9	163	2,3,3',4',5,6-Hexachlorobiphenyl		6.99	6.70	6.19	(0.29)
74472-45-0	164	2,3,3',4',5',6-Hexachlorobiphenyl		7.02	6.73	6.19	(0.29)
74472-46-1	165	2,3,3',5,5',6-Hexachlorobiphenyl		7.05	6.76	6.02	(0.29)
41411-63-6	166	2,3,4,4',5,6-Hexachlorobiphenyl		6.93	6.64	6.25	(0.29)
52663-72-6	167	2,3',4,4',5,5'-Hexachlorobiphenyl		7.27	6.98	6.02	(0.31)
59291-65-5	168	2,3',4,4',5',6-Hexachlorobiphenyl		7.11	6.82	6.08	(0.29)
32774-16-6	169	3,3',4,4',5,5'-Hexachlorobiphenyl		7.42	7.13	6.23	(0.32)
35065-30-6	170	2,2',3,3',4,4',5-Heptachlorobiphenyl		7.27	6.98	6.66	(0.30)
52663-71-5	171	2,2',3,3',4,4',6-Heptachlorobiphenyl		7.11	6.82	6.43	(0.30)
52663-74-8	172	2,2',3,3',4,5,5'-Heptachlorobiphenyl		7.33	7.04	6.50	(0.30)
68194-16-1	173	2,2',3,3',4,5,6-Heptachlorobiphenyl		7.02	6.73	6.45	(0.30)
38411-25-5	174	2,2',3,3',4,5,6'-Heptachlorobiphenyl		7.11	6.82	6.39	(0.30)
40186-70-7	175	2,2',3,3',4,5',6-Heptachlorobiphenyl		7.17	6.88	6.27	(0.29)
52663-65-7	176	2,2',3,3',4,6,6'-Heptachlorobiphenyl		6.76	6.47	6.16	(0.29)
52663-70-4	177	2,2',3,3',4,5',6'-Heptachlorobiphenyl		7.08	6.79	6.41	(0.30)
52663-67-9	178	2,2',3,3',5,5',6-Heptachlorobiphenyl		7.14	6.853	6.24	(0.29)
52663-64-6	179	2,2',3,3',5,6,6'-Heptachlorobiphenyl		6.73	6.44	6.12	(0.29)
35065-29-3	180	2,2',3,4,4',5,5'-Heptachlorobiphenyl		7.36	7.07	6.53	(0.30)

Polychlorinated Biphenyl Congeners

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/congenertable.pdf

CASRN	Congener Number	IUPAC Name	logKow Ruelle	logKow Hawker	logKpew Fernandez	log Koc (95% CR) Hansen	
74472-47-2	181	2,2',3,4,4',5,6-Heptachlorobiphenyl		7.11	6.82	6.39	(0.30)
60145-23-5	182	2,2',3,4,4',5,6'-Heptachlorobiphenyl		7.20	6.91	6.28	(0.29)
52663-69-1	183	2,2',3,4,4',5',6-Heptachlorobiphenyl		7.20	6.91	6.30	(0.29)
74472-48-3	184	2,2',3,4,4',6,6'-Heptachlorobiphenyl		6.85	6.56	6.06	(0.29)
52712-05-7	185	2,2',3,4,5,5',6-Heptachlorobiphenyl		7.11	6.82	6.35	(0.30)
74472-49-4	186	2,2',3,4,5,6,6'-Heptachlorobiphenyl		6.69	6.40	6.20	(0.29)
52663-68-0	187	2,2',3,4',5,5',6-Heptachlorobiphenyl		7.17	6.88	6.28	(0.29)
74487-85-7	188	2,2',3,4',5,6,6'-Heptachlorobiphenyl		6.82	6.53	6.02	(0.29)
39635-31-9	189	2,3,3',4,4',5,5'-Heptachlorobiphenyl		7.71	7.42	6.37	(0.33)
41411-64-7	190	2,3,3',4,4',5,6-Heptachlorobiphenyl		7.46	7.17	6.66	(0.30)
74472-50-7	191	2,3,3',4,4',5',6-Heptachlorobiphenyl		7.55	7.26	6.56	(0.30)
74472-51-8	192	2,3,3',4,5,5',6-Heptachlorobiphenyl		7.52	7.23	6.49	(0.30)
69782-91-8	193	2,3,3',4',5,5',6-Heptachlorobiphenyl		7.52	7.23	6.54	(0.30)
35694-08-7	194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl		7.80	7.51	6.96	(0.31)
52663-78-2	195	2,2',3,3',4,4',5,6-Octachlorobiphenyl		7.56	7.27	6.86	(0.31)
42740-50-1	196	2,2',3,3',4,4',5,6'-Octachlorobiphenyl		7.65	7.36	6.73	(0.31)
33091-17-7	197	2,2',3,3',4,4',6,6'-Octachlorobiphenyl		7.30	7.01	6.50	(0.30)
68194-17-2	198	2,2',3,3',4,5,5',6-Octachlorobiphenyl		7.62	7.33	6.69	(0.31)
52663-75-9	199	2,2',3,3',4,5,5',6'-Octachlorobiphenyl		7.20	6.91	6.57	(0.30)
52663-73-7	200	2,2',3,3',4,5,6,6'-Octachlorobiphenyl		7.27	6.98	6.47	(0.30)
40186-71-8	201	2,2',3,3',4,5',6,6'-Octachlorobiphenyl		7.62	7.33	6.71	(0.31)
2136-99-4	202	2,2',3,3',5,5',6,6'-Octachlorobiphenyl		7.24	6.95	6.43	(0.30)
52663-76-0	203	2,2',3,4,4',5,5',6-Octachlorobiphenyl		7.65	7.36	6.73	(0.31)
74472-52-9	204	2,2',3,4,4',5,6,6'-Octachlorobiphenyl		7.30	7.01	6.48	(0.30)
74472-53-0	205	2,3,3',4,4',5,5',6-Octachlorobiphenyl		8.00	7.71	6.99	(0.32)
40186-72-9	206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl		8.09	7.80	7.13	(0.32)
52663-79-3	207	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl		7.74	7.45	6.90	(0.31)
52663-77-1	208	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl		7.71	7.42	6.86	(0.31)
2051-24-3	209	Decachlorobiphenyl		8.18	7.89	7.27	(0.33)

Appendix M

Two-Carbon Partitioning Model Calculations

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.0126	U	4.46	4.40	1.99	0.0000	4.78	0.0000	8.33	0.0000
	PCB 2	0.0133	U	4.69	4.51	2.10	0.0000	5.01	0.0000	8.57	0.0000
	PCB 3	0.0143	U	4.69	4.52	2.11	0.0000	5.01	0.0000	8.57	0.0000
	PCB 4	0.2590	U	4.65	4.40	1.99	0.0000	4.97	0.0000	8.53	0.0000
	PCB 5	0.0709	U	4.97	4.72	2.31	0.0000	5.30	0.0000	8.85	0.0000
	PCB 6	0.0704	U	5.06	4.71	2.30	0.0000	5.39	0.0000	8.94	0.0000
	PCB 7	0.0654	U	5.07	4.67	2.26	0.0000	5.40	0.0000	8.95	0.0000
	PCB 8	0.0667	U	5.07	4.72	2.31	0.0000	5.40	0.0000	8.95	0.0000
	PCB 9	0.0717	U	5.06	4.67	2.26	0.0000	5.39	0.0000	8.94	0.0000
	PCB 10	0.1660		4.84	4.40	1.99	1.7165	5.16	0.1730	2.98	0.1730
	PCB 11	0.0746	U	5.28	4.84	2.43	0.0000	5.61	0.0000	9.17	0.0000
	PCBs 12 + 13	0.0716	U	5.26	4.86	2.45	0.0000	5.59	0.0000	9.14	0.0000
	PCB 14	0.0723	U	5.28	4.77	2.36	0.0000	5.61	0.0000	9.17	0.0000
	PCB 15	0.0787	U	5.30	4.88	2.47	0.0000	5.63	0.0000	9.19	0.0000
	PCB 16	0.0487	U	5.16	4.88	2.47	0.0000	5.49	0.0000	9.04	0.0000
	PCB 17	0.6320		5.25	4.80	2.39	2.6017	5.58	0.2926	3.33	0.2926
	PCB 18	0.0303	U	5.24	4.79	2.38	0.0000	5.57	0.0000	9.12	0.0000
	PCB 19	2.7900		5.02	4.67	2.26	15.4933	5.35	4.2682	2.82	4.2682
	PCBs 20 + 28	0.5490		5.62	5.07	2.65	1.2278	5.96	0.0739	3.87	0.0739
	PCBs 21 + 33	0.2350		5.56	5.08	2.66	0.5136	5.89	0.0275	3.93	0.0275
	PCB 22	0.0212	U	5.58	5.11	2.70	0.0000	5.92	0.0000	9.47	0.0000
	PCB 23	0.0202	U	5.57	4.98	2.57	0.0000	5.91	0.0000	9.46	0.0000
	PCB 24	0.0284	U	5.35	4.84	2.43	0.0000	5.68	0.0000	9.24	0.0000
	PCB 25	0.1280		5.67	5.02	2.61	0.3175	6.01	0.0081	4.20	0.0081
	PCBs 26 + 29	0.0835		5.63	5.01	2.59	0.2144	5.97	0.0051	4.22	0.0051
	PCB 27	0.2910		5.44	4.79	2.38	1.2258	5.77	0.0554	3.72	0.0554
	PCB 30	0.1620		5.44	4.72	2.31	0.8018	5.77	0.0244	3.82	0.0244
	PCB 31	0.1030		5.67	5.04	2.63	0.2440	6.01	0.0060	4.24	0.0060
	PCB 32	0.4620		5.44	4.88	2.47	1.5819	5.77	0.1047	3.64	0.1047
	PCB 34	0.0233		5.66	4.98	2.57	0.0634	6.00	0.0007	4.49	0.0007
	PCB 35	0.0228	U	5.82	5.23	2.82	0.0000	6.16	0.0000	9.71	0.0000
	PCB 36	0.0211	U	5.88	5.15	2.74	0.0000	6.22	0.0000	9.78	0.0000
	PCB 37	0.0268	U	5.83	5.26	2.85	0.0000	6.17	0.0000	9.72	0.0000
	PCB 38	0.0234	U	5.76	5.19	2.78	0.0000	6.10	0.0000	9.65	0.0000
	PCB 39	0.0199	U	5.89	5.16	2.75	0.0000	6.23	0.0000	9.79	0.0000

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCBs 40 + 71	1.5700		5.82	5.37	2.96	1.7396	6.16	0.9729	3.21	0.9729
	PCB 41	0.5910		5.69	5.35	2.94	0.6857	6.03	0.0627	3.97	0.0627
	PCB 42	0.2890	J	5.76	5.31	2.90	0.3677	6.10	0.0187	4.19	0.0187
	PCBs 43 + 73	0.0348	U	5.90	5.21	2.79	0.0000	6.24	0.0000	9.79	0.0000
	PCBs 44 + 47 + 65	21.6000		5.82	5.26	2.84	31.0689	6.16	6.0945	3.55	6.0945
	PCBs 45 + 51	10.4000		5.58	5.11	2.69	21.2116	5.92	4.6444	3.35	4.6444
	PCB 46	0.2110	J	5.53	5.16	2.75	0.3792	5.87	0.0253	3.92	0.0253
	PCB 48	0.0385	U	5.78	5.23	2.82	0.0000	6.12	0.0000	9.67	0.0000
	PCB 49	10.2000		5.85	5.22	2.81	15.9639	6.19	2.0538	3.70	2.0538
	PCBs 50 + 53	7.2200		5.63	5.04	2.63	17.1032	5.96	2.5866	3.45	2.5866
	PCB 52	8.2500		5.84	5.20	2.79	13.5205	6.18	1.5895	3.72	1.5895
	PCB 54	1.6400		5.21	4.94	2.53	4.8908	5.54	1.1259	3.16	1.1259
	PCB 55	0.0443	U	6.11	5.44	3.03	0.0000	6.45	0.0000	10.01	0.0000
	PCB 56	0.1260	J	6.11	5.47	3.06	0.1109	6.45	0.0018	4.83	0.0018
	PCB 57	0.0328		6.17	5.34	2.93	0.0389	6.52	0.0002	5.17	0.0002
	PCB 58	0.0314	U	6.17	5.34	2.93	0.0000	6.52	0.0000	7.67	0.0000
	PCBs 59 + 62 + 75	0.3890	J	5.96	5.26	2.85	0.5510	6.31	0.0149	4.42	0.0149
	PCB 60	0.0411	J	6.11	5.47	3.06	0.0362	6.45	0.0004	5.04	0.0004
	PCB 61	0.0339	U	6.04	5.38	2.97	0.0000	6.38	0.0000	9.94	0.0000
	PCB 63	0.0324	U	6.17	5.37	2.96	0.0000	6.52	0.0000	10.07	0.0000
	PCB 64	0.2020		5.95	5.36	2.95	0.2290	6.29	0.0061	4.52	0.0061
	PCB 66	1.3300		6.20	5.41	3.00	1.3440	6.55	0.0390	4.53	0.0390
	PCB 67	0.0286	U	6.20	5.35	2.94	0.0000	6.55	0.0000	10.10	0.0000
	PCB 68	0.1100		6.26	5.31	2.90	0.1399	6.61	0.0009	5.07	0.0009
	PCB 69	0.0241		6.04	5.19	2.78	0.0404	6.38	0.0002	5.04	0.0002
	PCBs 70 + 74 + 76	1.2400		6.18	5.40	2.98	1.2921	6.52	0.0381	4.51	0.0381
	PCB 72	0.0299	U	6.26	5.29	2.88	0.0000	6.61	0.0000	7.76	0.0000
	PCB 77	0.0832	J	6.13	5.40	2.99	0.0860	6.47	0.0010	4.94	0.0010
	PCB 78	0.0237	U	4.97	4.72	2.31	0.0000	5.30	0.0000	6.45	0.0000
	PCB 79	0.0453		6.42	5.53	3.12	0.0347	6.77	0.0002	5.47	0.0002
	PCB 80	0.0195	U	6.48	5.42	3.01	0.0000	6.83	0.0000	10.38	0.0000
	PCB 81	0.0215	U	6.36	5.59	3.18	0.0000	6.71	0.0000	10.26	0.0000

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 82	0.7230	J	6.20	5.86	3.45	0.2592	6.55	0.0157	4.66	0.0157
	PCBs 83 + 99	6.7100		6.31	5.68	3.26	3.6835	6.66	0.2600	4.41	0.2600
	PCB 84	1.7900		6.04	5.61	3.20	1.1413	6.38	0.0956	4.27	0.0956
	PCB 85	3.6600		6.30	5.78	3.37	1.5777	6.65	0.1130	4.51	0.1130
	PCBs 86 + 87 + 97 + 109 + 119 + 125	7.0400		6.37	5.69	3.28	3.7192	6.72	0.2302	4.49	0.2302
	PCB 88	0.0266		6.07	5.53	3.12	0.0204	6.41	0.0002	5.06	0.0002
	PCB 89	0.1140		6.07	5.63	3.22	0.0694	6.41	0.0018	4.80	0.0018
	PCBs 90 + 101 + 113	14.0000		6.43	5.65	3.23	8.2035	6.78	0.5084	4.44	0.5084
	PCB 91	8.5200		6.13	5.55	3.14	6.2370	6.47	0.6425	4.12	0.6425
	PCB 92	2.6900		6.35	5.61	3.20	1.7151	6.70	0.0640	4.62	0.0640
	PCB 93	0.0268		6.04	5.51	3.10	0.0215	6.38	0.0003	5.02	0.0003
	PCB 94	0.6990		6.13	5.47	3.06	0.6152	6.47	0.0196	4.55	0.0196
	PCBs 95 + 100	13.7000		6.18	5.48	3.06	11.9195	6.53	1.0866	4.10	1.0866
	PCB 96	1.3900	J	5.71	5.38		1.5051		1.9642	2.85	1.9642
	PCBs 98 + 102	0.6240	J	6.15	5.51	3.09	0.5067	6.49	0.0159	4.59	0.0159
	PCB 103	1.5700		6.22	5.41	3.00	1.5865	6.57	0.0462	4.53	0.0462
	PCB 104	0.4710		5.81	5.27	2.86	0.6570	6.15	0.0319	4.17	0.0319
	PCB 105	2.5200		6.65	5.83	3.42	0.9681	7.00	0.0218	5.06	0.0218
	PCB 106	0.0378	U	6.64	5.73	3.32	0.0000	6.99	0.0000	10.55	0.0000
	PCB 107	0.5650		6.71	5.72	3.31	0.2796	7.06	0.0021	5.42	0.0021
	PCBs 108 + 124	0.3510		6.72	5.72	3.30	0.1757	7.07	0.0010	5.52	0.0010
	PCBs 110 + 115	8.4100		6.49	5.79	3.37	3.5837	6.84	0.2032	4.62	0.2032
	PCB 111	0.0726		6.76	5.60	3.19	0.0474	7.12	0.0000	10.67	0.0000
	PCB 112	0.0767	U	6.45	5.70	3.29	0.0000	6.80	0.0000	10.35	0.0000
	PCB 114	0.1430		6.65	5.77	3.36	0.0631	7.00	0.0004	5.59	0.0004
	PCBs 117 + 116	0.9780		6.40	5.76	3.34	0.4466	6.74	0.0131	4.87	0.0131
	PCB 118	6.4600		6.74	5.73	3.32	3.1244	7.09	0.0620	5.02	0.0620
	PCB 120	0.0725	U	6.79	5.62	3.21	0.0000	7.15	0.0000	10.70	0.0000
	PCB 121	0.1160	J	6.64	5.54	3.13	0.0869	6.99	0.0003	5.61	0.0003
	PCB 122	0.0909		6.64	5.78	3.37	0.0392	6.99	0.0002	5.66	0.0002
	PCB 123	0.0876		6.74	5.73	3.32	0.0424	7.09	0.0001	5.81	0.0001
	PCB 126	0.1730	J	6.89	5.95	3.54	0.0504	7.25	0.0002	5.90	0.0002

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 127	0.0382		6.95	5.83	3.42	0.0147	7.31	0.0028	4.14	0.0028
	PCB 128	1.8300		6.74	6.32	3.91	0.2275	7.09	0.0100	5.26	0.0100
	PCBs 129 + 138 + 163	21.1000		6.85	6.20	3.79	3.4315	7.21	0.2213	4.98	0.2213
	PCB 130	0.8550		6.80	6.15	3.74	0.1572	7.16	0.0028	5.48	0.0028
	PCB 131	0.1260		6.58	6.00	3.59	0.0327	6.93	0.0004	5.51	0.0004
	PCB 132	5.0200		6.58	6.06	3.65	1.1356	6.93	0.0704	4.85	0.0704
	PCB 133	0.4360		6.86	6.01	3.60	0.1107	7.22	0.0009	5.69	0.0009
	PCB 134	0.6330		6.55	5.98	3.57	0.1722	6.90	0.0042	5.18	0.0042
	PCBs 135 + 154	1.6000		6.70	5.87	3.45	0.5671	7.05	0.0097	5.22	0.0097
	PCB 136	3.5400		6.22	5.79	3.38	1.4912	6.57	0.1374	4.41	0.1374
	PCB 137	0.6590		6.83	6.17	3.76	0.1157	7.19	0.0018	5.57	0.0018
	PCBs 139 + 140	0.2810		6.67	5.95	3.54	0.0819	7.02	0.0009	5.50	0.0009
	PCB 141	2.7800		6.82	6.12	3.71	0.5478	7.18	0.0141	5.29	0.0141
	PCB 142	0.0707	U	6.51	6.00	3.59	0.0000	6.86	0.0000	10.42	0.0000
	PCB 143	0.0676	U	6.60	5.98	3.57	0.0000	6.95	0.0000	10.51	0.0000
	PCB 144	0.3720	J	6.67	5.90	3.49	0.1216	7.02	0.0013	5.44	0.0013
	PCB 145	0.0199	U	6.25	5.76	3.35	0.0000	6.60	0.0000	10.15	0.0000
	PCB 146	2.9100		6.89	6.04	3.63	0.6893	7.25	0.0120	5.38	0.0120
	PCBs 147 + 149	17.7000		6.66	5.93	3.52	5.4015	7.01	0.3316	4.73	0.3316
	PCB 148	0.2070		6.73	5.79	3.38	0.0872	7.08	0.0005	5.64	0.0005
	PCB 150	0.3940		6.32	5.69	3.28	0.2089	6.67	0.0046	4.93	0.0046
	PCB 151	6.1200		6.64	5.88	3.47	2.0955	6.99	0.0786	4.89	0.0786
	PCB 152	0.5630		6.22	5.73	3.32	0.2723	6.57	0.0106	4.73	0.0106
	PCBs 153 + 168	14.9000		7.02	6.07	3.66	3.2940	7.37	0.0812	5.26	0.0812
	PCB 155	0.0715		6.41	5.59	3.18	0.0477	6.76	0.0003	5.37	0.0003
	PCBs 156 + 157	1.2500		7.18	6.11	3.70	0.2520	7.54	0.0014	5.96	0.0014
	PCB 158	1.3800		7.02	6.20	3.79	0.2262	7.38	0.0027	5.71	0.0027
	PCB 159	0.1330	J	7.24	5.98	3.57	0.0362	7.60	0.0000	6.46	0.0000
	PCB 160	0.0286	U	6.93	6.19	3.78	0.0000	7.29	0.0000	10.84	0.0000
	PCB 161	0.0488	U	7.08	6.04	3.63	0.0000	7.44	0.0000	10.99	0.0000
	PCB 162	0.0462		7.24	6.00	3.59	0.0120	7.60	0.0000	6.60	0.0000
	PCB 164	0.9060		7.02	6.19	3.78	0.1519	7.38	0.0015	5.79	0.0015
	PCB 165	0.0504	U	7.05	6.02	3.61	0.0000	7.41	0.0000	10.96	0.0000
	PCB 166	0.0509	U	6.93	6.25	3.84	0.0000	7.29	0.0000	10.84	0.0000

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 167	0.4190	J	7.27	6.02	3.61	0.1039	7.63	0.0002	6.29	0.0002
	PCB 169	0.0402	U	7.42	6.23	3.82	0.0000	7.79	0.0000	11.34	0.0000
	PCB 170	6.9800		7.27	6.66	4.25	0.3966	7.63	0.0117	5.78	0.0117
	PCBs 171 + 173	2.0600		7.07	6.44	4.03	0.1943	7.42	0.0041	5.70	0.0041
	PCB 172	1.2900	J	7.33	6.50	4.09	0.1060	7.69	0.0009	6.17	0.0009
	PCB 174	5.6300		7.11	6.39	3.98	0.5957	7.47	0.0147	5.58	0.0147
	PCB 175	0.0261		7.17	6.27	3.86	0.0036	7.53	0.0000	6.67	0.0000
	PCB 176	0.6690		6.76	6.16	3.75	0.1202	7.12	0.0023	5.47	0.0023
	PCB 177	3.9500		7.08	6.41	4.00	0.3992	7.44	0.0098	5.61	0.0098
	PCB 178	1.3200		7.14	6.24	3.83	0.1973	7.50	0.0017	5.89	0.0017
	PCB 179	2.7200		6.73	6.12	3.71	0.5359	7.08	0.0183	5.17	0.0183
	PCBs 180 + 193	14.3000		7.44	6.54	4.12	1.0836	7.81	0.0186	5.88	0.0186
	PCB 181	0.0407	U	7.11	6.39	3.98	0.0000	7.47	0.0000	11.02	0.0000
	PCB 182	0.0260	U	7.20	6.28	3.87	0.0000	7.56	0.0000	11.12	0.0000
	PCB 183	4.3200		7.20	6.30	3.89	0.5624	7.56	0.0076	5.76	0.0076
	PCB 184	0.0170	U	6.85	6.06	3.65	0.0000	7.21	0.0000	10.76	0.0000
	PCB 185	0.8900		7.11	6.35	3.94	0.1033	7.47	0.0011	5.92	0.0011
	PCB 186	0.0188	U	6.69	6.20	3.79	0.0000	7.04	0.0000	10.60	0.0000
	PCB 187	7.4000		7.17	6.28	3.87	1.0087	7.53	0.0179	5.62	0.0179
	PCB 188	0.1630		6.82	6.02	3.61	0.0404	7.18	0.0003	5.81	0.0003
	PCB 189	0.2000		7.71	6.37	3.96	0.0222	8.08	0.0000	7.03	0.0000
	PCB 190	1.5200		7.46	6.66	4.25	0.0864	7.83	0.0007	6.33	0.0007
	PCB 191	0.3150		7.55	6.56	4.15	0.0225	7.92	0.0001	6.75	0.0001
	PCB 192	0.0358	U	7.52	6.49	4.08	0.0000	7.89	0.0000	11.44	0.0000
	PCB 194	4.1100		7.80	6.96	4.55	0.1171	8.17	0.0010	6.64	0.0010
	PCB 195	1.7400		7.56	6.86	4.45	0.0624	7.93	0.0006	6.45	0.0006
	PCB 196	2.2500		7.65	6.73	4.32	0.1088	8.02	0.0007	6.53	0.0007
	PCB 197	0.1640	J	7.30	6.50	4.09	0.0135	7.66	0.0001	6.51	0.0001
	PCBs 198 + 199	3.4800		7.41	6.63	4.22	0.2119	7.78	0.0028	6.10	0.0028
	PCB 200	0.3940		7.27	6.47	4.06	0.0347	7.63	0.0002	6.30	0.0002
	PCB 201	0.4900		7.62	6.71	4.30	0.0248	7.99	0.0001	6.77	0.0001
	PCB 202	0.6480		7.24	6.43	4.02	0.0625	7.60	0.0004	6.17	0.0004
	PCB 203	2.0700		7.65	6.73	4.32	0.1001	8.02	0.0006	6.54	0.0006
	PCB 204	0.0197	U	7.30	6.48	4.07	0.0000	7.66	0.0000	11.22	0.0000
	PCB 205	0.2010		8.00	6.99	4.58	0.0053	8.37	0.0000	7.48	0.0000

PW001 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW001

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimates

Sum Total Sediment PCB Congeners OC Porewater Calc.	167.20	ng/L
Individual Congener OC Porewater Calc.	216.51	ng/L
Individual Congener OC+BC Porewater Calc.	30.84	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 206	0.7940		8.09	7.13	4.72	0.0153	8.47	0.0000	7.36	0.0000
	PCB 207	0.1090		7.74	6.90	4.49	0.0036	8.11	0.0000	7.22	0.0000
	PCB 208	0.1260	UJ	7.71	6.86	4.45	0.0045	8.08	0.0000	11.63	0.0000
	PCB 209	0.0199	U	8.18	7.27	4.86	0.0000	8.56	0.0000	12.11	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW002 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW002

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.33%	RI Calc Total PCB Congeners	479	µg/kg	6.14	5.68
f_{BC}=	0.18%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimattes

Sum Total Sediment PCB Congeners OC Porewater Calc.	39.50	ng/L
Sum Individual Congener OC Porewater Calc.	88.15	ng/L
Sum Individual Congener OC+BC Porewater Calc.	29.17	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCB 1	0.1000	J	4.46	4.40	2.80	0.1586	4.78	0.0000	8.63	0.0000
	PCB 2	0.0331	J	4.69	4.51	2.91	0.0408	5.01	0.0000	8.87	0.0000
	PCB 3	0.0494	J	4.69	4.52	2.92	0.0594	5.01	0.0000	8.87	0.0000
	PCB 4	3.8700		4.65	4.40	2.80	6.1381	4.97	0.0000	8.83	0.0000
	PCB 5	0.0988	U	4.97	4.72	3.12	0.0000	5.30	0.0000	9.15	0.0000
	PCB 6	0.1910		5.06	4.71	3.11	0.1484	5.39	0.0000	9.24	0.0000
	PCB 7	0.0912	U	5.07	4.67	3.07	0.0000	5.40	0.0000	9.25	0.0000
	PCB 8	0.4600		5.07	4.72	3.12	0.3492	5.40	0.0000	9.25	0.0000
	PCB 9	0.1000	U	5.06	4.67	3.07	0.0000	5.39	0.0000	9.24	0.0000
	PCB 10	0.1710	U	4.84	4.40	2.80	0.0000	5.16	0.0000	9.02	0.0000
	PCB 11	0.1040	U	5.28	4.84	3.24	0.0000	5.61	0.0000	9.47	0.0000
	PCBs 12 + 13	0.0999	U	5.26	4.86	3.26	0.0000	5.59	0.0000	9.44	0.0000
	PCB 14	0.1010	U	5.28	4.77	3.17	0.0000	5.61	0.0000	9.47	0.0000
	PCB 15	0.2550		5.30	4.88	3.28	0.1339	5.63	0.0000	9.49	0.0000
	PCB 16	0.2860		5.16	4.88	3.28	0.1502	5.49	0.0000	9.34	0.0000
	PCB 17	3.7400		5.25	4.80	3.20	2.3616	5.58	0.9614	3.59	1.4943
	PCB 18	0.0337	U	5.24	4.79	3.19	0.0000	5.57	0.0000	9.43	0.0000
	PCB 19	10.7000		5.02	4.67	3.07	9.1140	5.35	4.2722	3.40	1.4884
	PCBs 20 + 28	6.5000		5.62	5.07	3.46	2.2297	5.96	0.6533	4.00	0.6927
	PCBs 21 + 33	1.4400		5.56	5.08	3.47	0.4827	5.89	0.1194	4.08	0.1820
	PCB 22	0.2980		5.58	5.11	3.51	0.0922	5.92	0.0000	9.77	0.0000
	PCB 23	0.0691	U	5.57	4.98	3.38	0.0000	5.91	0.0000	9.76	0.0000
	PCB 24	0.0316	U	5.35	4.84	3.24	0.0000	5.68	0.0000	9.54	0.0000
	PCB 25	0.6240		5.67	5.02	3.42	0.2374	6.01	0.0314	4.30	0.0547
	PCBs 26 + 29	0.7850		5.63	5.01	3.40	0.3092	5.97	0.0335	4.37	0.0213
	PCB 27	1.2500		5.44	4.79	3.19	0.8077	5.77	0.0954	4.12	0.0348
	PCB 30	1.4700		5.44	4.72	3.12	1.1159	5.77	0.1245	4.07	0.0480
	PCB 31	1.5400		5.67	5.04	3.44	0.5596	6.01	0.0802	4.28	0.0637
	PCB 32	5.4400		5.44	4.88	3.28	2.8571	5.77	0.6607	3.92	0.2484
	PCB 34	0.0796	U	5.66	4.98	3.38	0.0000	6.00	0.0000	9.85	0.0000
	PCB 35	0.0780	U	5.82	5.23	3.63	0.0000	6.16	0.0000	10.02	0.0000
	PCB 36	0.0719	U	5.88	5.15	3.55	0.0000	6.22	0.0000	10.08	0.0000
	PCB 37	0.2940	J	5.83	5.26	3.66	0.0644	6.17	0.0000	10.03	0.0000
	PCB 38	0.0800	U	5.76	5.19	3.59	0.0000	6.10	0.0000	9.95	0.0000
	PCB 39	0.0680	U	5.89	5.16	3.56	0.0000	6.23	0.0000	10.09	0.0000

PW002 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW002

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.33%	RI Calc Total PCB Congeners	479	µg/kg	6.14	5.68
f_{BC}=	0.18%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Estimattes

Sum Total Sediment PCB Congeners OC Porewater Calc.	39.50	ng/L
Sum Individual Congener OC Porewater Calc.	88.15	ng/L
Sum Individual Congener OC+BC Porewater Calc.	29.17	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCBs 40 + 71	4.4100		5.82	5.37	3.77	0.7495	6.16	0.6036	3.86	1.0247
	PCB 41	1.7000		5.69	5.35	3.75	0.3025	6.03	0.0708	4.38	0.0497
	PCB 42	0.9070		5.76	5.31	3.71	0.1770	6.10	0.0280	4.51	0.0239
	PCBs 43 + 73	0.0336	U	5.90	5.21	3.60	0.0000	6.24	0.0000	10.09	0.0000
	PCBs 44 + 47 + 65	53.0000		5.82	5.26	3.66	5.8400	6.16	5.0229	4.02	5.1253
	PCBs 45 + 51	37.0000		5.58	5.11	3.50	11.5752	5.92	6.3696	3.76	11.4726
	PCB 46	1.4900		5.53	5.16	3.56	0.4107	5.87	0.0739	4.30	0.0208
	PCB 48	0.0372	U	5.78	5.23	3.63	0.0000	6.12	0.0000	9.97	0.0000
	PCB 49	32.8000		5.85	5.22	3.62	7.8741	6.19	2.2797	4.16	1.1997
	PCBs 50 + 53	26.8000		5.63	5.04	3.44	9.7378	5.96	2.8745	3.97	0.9028
	PCB 52	25.7000		5.84	5.20	3.60	6.4604	6.18	1.9300	4.12	1.4938
	PCB 54	6.7800		5.21	4.94	3.34	3.1014	5.54	1.1210	3.78	0.2018
	PCB 55	0.0429	U	6.11	5.44	3.84	0.0000	6.45	0.0000	10.31	0.0000
	PCB 56	0.3460		6.11	5.47	3.87	0.0467	6.45	0.0026	5.12	0.0023
	PCB 57	0.0317	U	6.17	5.34	3.74	0.0000	6.52	0.0000	10.37	0.0000
	PCB 58	0.0304	U	6.17	5.34	3.74	0.0000	6.52	0.0000	10.37	0.0000
	PCBs 59 + 62 + 75	1.2400		5.96	5.26	3.66	0.2694	6.31	0.0213	4.76	0.0125
	PCB 60	0.0744		6.11	5.47	3.87	0.0100	6.45	0.0003	5.34	0.0004
	PCB 61	0.0328	U	6.04	5.38	3.78	0.0000	6.38	0.0000	10.24	0.0000
	PCB 63	0.2820		6.17	5.37	3.77	0.0479	6.52	0.0000	10.37	0.0000
	PCB 64	0.5340		5.95	5.36	3.76	0.0929	6.29	0.0077	4.84	0.0065
	PCB 66	2.6100		6.20	5.41	3.81	0.4045	6.55	0.0348	4.87	0.0350
	PCB 67	0.0277	U	6.20	5.35	3.75	0.0000	6.55	0.0000	10.40	0.0000
	PCB 68	0.5540	J	6.26	5.31	3.71	0.1081	6.61	0.0030	5.26	0.0024
	PCB 69	0.0233	U	6.04	5.19	3.59	0.0000	6.38	0.0000	10.24	0.0000
	PCBs 70 + 74 + 76	2.3400		6.18	5.40	3.80	0.3740	6.52	0.0260	4.95	0.0149
	PCB 72	0.1850	J	6.26	5.29	3.69	0.0378	6.61	0.0000	10.46	0.0000
	PCB 77	0.1170	J	6.13	5.40	3.80	0.0186	6.47	0.0005	5.35	0.0004
	PCB 78	0.0417	U	4.97	4.72	3.12	0.0000	5.30	0.0000	9.15	0.0000
	PCB 79	0.0721	J	6.42	5.53	3.93	0.0085	6.77	0.0002	5.66	0.0004
	PCB 80	0.0343	U	6.48	5.42	3.82	0.0000	6.83	0.0000	10.69	0.0000
	PCB 81	0.0383	U	6.36	5.59	3.99	0.0000	6.71	0.0000	10.56	0.0000

PW002 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW002

f_{TOC}=	2.51%			Concentration	log Kow	log Koc
f_{OC}=	2.33%	RI Calc Total PCB Congeners	479	µg/kg	6.14	5.68
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Sum Individual Congener OC+BC Porewater Calc.	29.17	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCB 82	0.1600		6.20	5.86	4.26	0.0088	6.55	0.0006	5.46	0.0004
	PCBs 83 + 99	5.8500		6.31	5.68	4.07	0.4926	6.66	0.0840	4.84	0.1416
	PCB 84	1.0800		6.04	5.61	4.01	0.1056	6.38	0.0129	4.92	0.0079
	PCB 85	1.6500		6.30	5.78	4.18	0.1091	6.65	0.0144	5.06	0.0218
	PCBs 86 + 87 + 97 + 109 + 119 + 125	4.4800		6.37	5.69	4.09	0.3630	6.72	0.0419	5.03	0.0446
	PCB 88	0.0431	U	6.07	5.53	3.93	0.0000	6.41	0.0000	10.27	0.0000
	PCB 89	0.0655	U	6.07	5.63	4.03	0.0000	6.41	0.0000	10.27	0.0000
	PCBs 90 + 101 + 113	15.0000		6.43	5.65	4.05	1.3482	6.78	0.1920	4.89	0.2161
	PCB 91	11.6000		6.13	5.55	3.95	1.3025	6.47	0.3749	4.49	0.8241
	PCB 92	4.0100		6.35	5.61	4.01	0.3922	6.70	0.0453	4.95	0.0711
	PCB 93	0.0434	U	6.04	5.51	3.91	0.0000	6.38	0.0000	10.24	0.0000
	PCB 94	1.8600		6.13	5.47	3.87	0.2511	6.47	0.0244	4.88	0.0198
	PCBs 95 + 100	17.0000		6.18	5.48	3.87	2.2687	6.53	0.4465	4.58	0.4233
	PCB 96	2.4400		5.71	5.38		0.4052		0.4365	3.75	0.5624
	PCBs 98 + 102	1.0400		6.15	5.51	3.90	0.1295	6.49	0.0071	5.16	0.0022
	PCB 103	3.2800		6.22	5.41	3.81	0.5084	6.57	0.0295	5.05	0.0100
	PCB 104	1.1300		5.81	5.27	3.67	0.2418	6.15	0.0163	4.84	0.0020
	PCB 105	0.6840		6.65	5.83	4.23	0.0403	7.00	0.0014	5.68	0.0021
	PCB 106	0.0518	U	6.64	5.73	4.13	0.0000	6.99	0.0000	10.85	0.0000
	PCB 107	0.5360		6.71	5.72	4.12	0.0407	7.06	0.0009	5.76	0.0017
	PCBs 108 + 124	0.0487	U	6.72	5.72	4.11	0.0000	7.07	0.0000	10.93	0.0000
	PCBs 110 + 115	4.9300		6.49	5.79	4.18	0.3222	6.84	0.0285	5.24	0.0199
	PCB 111	0.0599	J	6.76	5.60	4.00	0.0060	7.12	0.0000	10.97	0.0000
	PCB 112	0.0444	U	6.45	5.70	4.10	0.0000	6.80	0.0000	10.66	0.0000
	PCB 114	0.0459	U	6.65	5.77	4.17	0.0000	7.00	0.0000	10.86	0.0000
	PCBs 117 + 116	1.3200		6.40	5.76	4.15	0.0924	6.74	0.0044	5.47	0.0014
	PCB 118	2.4800		6.74	5.73	4.13	0.1840	7.09	0.0047	5.72	0.0029
	PCB 120	0.0419	U	6.79	5.62	4.02	0.0000	7.15	0.0000	11.00	0.0000
	PCB 121	0.2860		6.64	5.54	3.94	0.0329	6.99	0.0003	5.92	0.0003

PW002 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW002

f_{TOC}=	2.51%			Concentration	log Kow	log Koc
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Summary Estimattes

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Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCB 122	0.0578	U	6.64	5.78	4.18	0.0000	6.99	0.0000	10.85	0.0000
	PCB 123	0.0452	U	6.74	5.73	4.13	0.0000	7.09	0.0000	10.95	0.0000
	PCB 126	0.1720	J	6.89	5.95	4.35	0.0077	7.25	0.0001	6.38	0.0001
	PCB 127	0.0523	U	6.95	5.83	4.23	0.0000	7.31	0.0000	4.60	0.0000
	PCB 128	0.7150		6.74	6.32	4.72	0.0136	7.09	0.0010	5.84	0.0013
	PCBs 129 + 138 + 163	17.1000		6.85	6.20	4.60	0.4266	7.21	0.0867	5.29	0.3352
	PCB 130	0.4370		6.80	6.15	4.55	0.0123	7.16	0.0004	6.06	0.0004
	PCB 131	0.0472	U	6.58	6.00	4.40	0.0000	6.93	0.0000	10.79	0.0000
	PCB 132	3.7800		6.58	6.06	4.46	0.1312	6.93	0.0148	5.41	0.0125
	PCB 133	0.9140		6.86	6.01	4.41	0.0356	7.22	0.0011	5.91	0.0017
	PCB 134	0.5200		6.55	5.98	4.38	0.0217	6.90	0.0009	5.77	0.0005
	PCBs 135 + 154	2.4300		6.70	5.87	4.26	0.1321	7.05	0.0073	5.52	0.0108
	PCB 136	4.3400		6.22	5.79	4.19	0.2804	6.57	0.0406	5.03	0.0153
	PCB 137	0.0488	U	6.83	6.17	4.57	0.0000	7.19	0.0000	11.04	0.0000
	PCBs 139 + 140	0.0482	U	6.67	5.95	4.35	0.0000	7.02	0.0000	10.88	0.0000
	PCB 141	2.3300		6.82	6.12	4.52	0.0704	7.18	0.0046	5.70	0.0070
	PCB 142	0.0563	U	6.51	6.00	4.40	0.0000	6.86	0.0000	10.72	0.0000
	PCB 143	0.0538	U	6.60	5.98	4.38	0.0000	6.95	0.0000	10.81	0.0000
	PCB 144	0.3830	J	6.67	5.90	4.30	0.0192	7.02	0.0008	5.70	0.0021
	PCB 145	0.0199	U	6.25	5.76	4.16	0.0000	6.60	0.0000	10.45	0.0000
	PCB 146	4.2000		6.89	6.04	4.44	0.1526	7.25	0.0082	5.71	0.0112
	PCBs 147 + 149	20.8000		6.66	5.93	4.33	0.9736	7.01	0.1678	5.09	0.3070
	PCB 148	0.4250		6.73	5.79	4.19	0.0275	7.08	0.0007	5.81	0.0014
	PCB 150	0.5580		6.32	5.69	4.09	0.0454	6.67	0.0025	5.35	0.0020
	PCB 151	7.1600		6.64	5.88	4.28	0.3760	6.99	0.0413	5.24	0.0717
	PCB 152	0.6630		6.22	5.73	4.13	0.0492	6.57	0.0039	5.23	0.0026
	PCBs 153 + 168	15.6000		7.02	6.07	4.47	0.5290	7.37	0.0250	5.80	0.0151
	PCB 155	0.1490		6.41	5.59	3.99	0.0153	6.76	0.0002	5.94	0.0000
	PCBs 156 + 157	0.6360		7.18	6.11	4.51	0.0197	7.54	0.0002	6.41	0.0004

PW002 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW002

f_{TOC}=	2.51%			Concentration	log Kow	log Koc
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Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCB 158	0.7710		7.02	6.20	4.60	0.0194	7.38	0.0005	6.22	0.0006
	PCB 159	0.1340	J	7.24	5.98	4.38	0.0056	7.60	0.0000	6.76	0.0000
	PCB 160	0.0227	U	6.93	6.19	4.59	0.0000	7.29	0.0000	11.14	0.0000
	PCB 161	0.0389	U	7.08	6.04	4.44	0.0000	7.44	0.0000	11.30	0.0000
	PCB 162	0.0849	U	7.24	6.00	4.40	0.0000	7.60	0.0000	6.90	0.0000
	PCB 164	0.7700	J	7.02	6.19	4.59	0.0198	7.38	0.0003	6.43	0.0001
	PCB 165	0.0401	U	7.05	6.02	4.42	0.0000	7.41	0.0000	11.26	0.0000
	PCB 166	0.0405	U	6.93	6.25	4.65	0.0000	7.29	0.0000	11.14	0.0000
	PCB 167	0.2450		7.27	6.02	4.42	0.0093	7.63	0.0000	6.79	0.0000
	PCB 169	0.0736	U	7.42	6.23	4.63	0.0000	7.79	0.0000	11.64	0.0000
	PCB 170	6.6900		7.27	6.66	5.06	0.0583	7.63	0.0046	6.16	0.0072
	PCBs 171 + 173	2.0300		7.07	6.44	4.84	0.0294	7.42	0.0014	6.16	0.0014
	PCB 172	1.3000		7.33	6.50	4.90	0.0164	7.69	0.0004	6.50	0.0007
	PCB 174	6.4800		7.11	6.39	4.79	0.1052	7.47	0.0047	6.14	0.0022
	PCB 175	0.2080		7.17	6.27	4.67	0.0045	7.53	0.0000	6.72	0.0000
	PCB 176	0.8030		6.76	6.16	4.56	0.0221	7.12	0.0007	6.06	0.0003
	PCB 177	4.7600		7.08	6.41	4.81	0.0738	7.44	0.0041	6.07	0.0031
	PCB 178	1.9800		7.14	6.24	4.64	0.0454	7.50	0.0010	6.28	0.0009
	PCB 179	3.3800		6.73	6.12	4.52	0.1022	7.08	0.0056	5.78	0.0019
	PCBs 180 + 193	14.6000		7.44	6.54	4.93	0.1697	7.81	0.0122	6.08	0.0509
	PCB 181	0.0734	U	7.11	6.39	4.79	0.0000	7.47	0.0000	11.33	0.0000
	PCB 182	0.0301	U	7.20	6.28	4.68	0.0000	7.56	0.0000	11.42	0.0000
	PCB 183	4.3800		7.20	6.30	4.70	0.0875	7.56	0.0016	6.45	0.0004
	PCB 184	0.0197	U	6.85	6.06	4.46	0.0000	7.21	0.0000	11.06	0.0000
	PCB 185	0.8400		7.11	6.35	4.75	0.0149	7.47	0.0002	6.61	0.0001
	PCB 186	0.0218	U	6.69	6.20	4.60	0.0000	7.04	0.0000	10.90	0.0000
	PCB 187	8.7400		7.17	6.28	4.68	0.1827	7.53	0.0053	6.22	0.0018
	PCB 188	0.2500	J	6.82	6.02	4.42	0.0095	7.18	0.0001	6.46	0.0000
	PCB 189	0.1980		7.71	6.37	4.77	0.0034	8.08	0.0000	7.46	0.0000
	PCB 190	1.5800		7.46	6.66	5.06	0.0138	7.83	0.0002	6.82	0.0002
	PCB 191	0.2990		7.55	6.56	4.96	0.0033	7.92	0.0000	7.09	0.0000
	PCB 192	0.0645	U	7.52	6.49	4.89	0.0000	7.89	0.0000	11.74	0.0000
	PCB 194	3.7100		7.80	6.96	5.36	0.0162	8.17	0.0005	6.88	0.0016

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Porewater Station PW002

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Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	**PCB Congener(s)**	**PCB Congener Concentration (µg/kg)**	**Data Qualifier**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
	PCB 195	1.5900		7.56	6.86	5.26	0.0087	7.93	0.0003	6.79	0.0005
	PCB 196	2.2100		7.65	6.73	5.13	0.0164	8.02	0.0003	6.82	0.0008
	PCB 197	0.1570		7.30	6.50	4.90	0.0020	7.66	0.0000	6.96	0.0000
	PCBs 198 + 199	3.4800		7.41	6.63	5.03	0.0325	7.78	0.0011	6.50	0.0014
	PCB 200	0.4550		7.27	6.47	4.87	0.0061	7.63	0.0001	6.73	0.0001
	PCB 201	0.4700		7.62	6.71	5.11	0.0037	7.99	0.0000	7.07	0.0001
	PCB 202	0.6880		7.24	6.43	4.83	0.0102	7.60	0.0002	6.62	0.0001
	PCB 203	1.9200		7.65	6.73	5.13	0.0142	8.02	0.0003	6.84	0.0006
	PCB 204	0.0258	U	7.30	6.48	4.88	0.0000	7.66	0.0000	11.52	0.0000
	PCB 205	0.1980		8.00	6.99	5.39	0.0008	8.37	0.0000	7.62	0.0000
	PCB 206	0.9760		8.09	7.13	5.53	0.0029	8.47	0.0000	7.41	0.0002
	PCB 207	0.1300		7.74	6.90	5.30	0.0007	8.11	0.0000	7.44	0.0000
	PCB 208	0.1410	J	7.71	6.86	5.26	0.0008	8.08	0.0000	11.94	0.0000
	PCB 209	0.1400		8.18	7.27	5.67	0.0003	8.56	0.0000	12.41	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW003 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW003

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.34%	RI Calc Total PCB Congeners	796	µg/kg	6.14	5.68
f_{BC}=	0.17%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Note: Used the average fbc for sites 1 - 2, and 4 - 6

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
65.64	ng/L	75.06	ng/L
		Congener OC+BC Porewater Calc.	
		22.08	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.1780		4.46	4.40	2.80	0.2823	4.78	0.0000	8.61	0.0000
	PCB 2	0.0440	U	4.69	4.51	2.91	0.0000	5.01	0.0000	8.84	0.0000
	PCB 3	0.1850		4.69	4.52	2.92	0.2226	5.01	0.0000	8.84	0.0000
	PCB 4	0.6450	U	4.65	4.40	2.80	0.0000	4.97	0.0000	8.80	0.0000
	PCB 5	0.1510	U	4.97	4.72	3.12	0.0000	5.30	0.0000	9.13	0.0000
	PCB 6	0.3460		5.06	4.71	3.11	0.2688	5.39	0.0000	9.22	0.0000
	PCB 7	0.1390	U	5.07	4.67	3.07	0.0000	5.40	0.0000	9.23	0.0000
	PCB 8	1.2100		5.07	4.72	3.12	0.9186	5.40	0.0000	9.23	0.0000
	PCB 9	0.1530	U	5.06	4.67	3.07	0.0000	5.39	0.0000	9.22	0.0000
	PCB 10	0.2900	U	4.84	4.40	2.80	0.0000	5.16	0.0000	8.99	0.0000
	PCB 11	0.4020		5.28	4.84	3.24	0.2315	5.61	0.0000	9.44	0.0000
	PCBs 12 + 13	0.1530	U	5.26	4.86	3.26	0.0000	5.59	0.0000	9.42	0.0000
	PCB 14	0.1540	U	5.28	4.77	3.17	0.0000	5.61	0.0000	9.44	0.0000
	PCB 15	0.8330		5.30	4.88	3.28	0.4375	5.63	0.0000	9.46	0.0000
	PCB 16	0.5410		5.16	4.88	3.28	0.2841	5.49	0.0000	9.32	0.0000
	PCB 17	1.1500		5.25	4.80	3.20	0.7261	5.58	0.2320	3.70	0.3678
	PCB 18	0.0565	U	5.24	4.79	3.19	0.0000	5.57	0.0000	9.40	0.0000
	PCB 19	0.8270		5.02	4.67	3.07	0.7044	5.35	0.1800	3.66	0.0601
	PCBs 20 + 28	8.6500		5.62	5.07	3.46	2.9672	5.96	0.9890	3.94	1.0558
	PCBs 21 + 33	3.3700		5.56	5.08	3.47	1.1297	5.89	0.3757	3.95	0.5825
	PCB 22	0.7750		5.58	5.11	3.51	0.2397	5.92	0.0000	9.75	0.0000
	PCB 23	0.0344	U	5.57	4.98	3.38	0.0000	5.91	0.0000	9.74	0.0000
	PCB 24	0.0531	U	5.35	4.84	3.24	0.0000	5.68	0.0000	9.51	0.0000
	PCB 25	0.4280	J	5.67	5.02	3.42	0.1628	6.01	0.0201	4.33	0.0350
	PCBs 26 + 29	0.7640		5.63	5.01	3.40	0.3009	5.97	0.0346	4.34	0.0220
	PCB 27	0.3620	J	5.44	4.79	3.19	0.2339	5.77	0.0186	4.29	0.0067
	PCB 30	1.8100		5.44	4.72	3.12	1.3741	5.77	0.1767	4.01	0.0678
	PCB 31	2.7300		5.67	5.04	3.44	0.9919	6.01	0.1838	4.17	0.1453
	PCB 32	3.1800		5.44	4.88	3.28	1.6701	5.77	0.3452	3.96	0.1288
	PCB 34	0.0396	U	5.66	4.98	3.38	0.0000	6.00	0.0000	9.83	0.0000
	PCB 35	0.0388	U	5.82	5.23	3.63	0.0000	6.16	0.0000	9.99	0.0000
	PCB 36	0.0358	U	5.88	5.15	3.55	0.0000	6.22	0.0000	10.05	0.0000
	PCB 37	0.9270		5.83	5.26	3.66	0.2030	6.17	0.0000	10.00	0.0000
	PCB 38	0.0398	U	5.76	5.19	3.59	0.0000	6.10	0.0000	9.93	0.0000
	PCB 39	0.1370		5.89	5.16	3.56	0.0378	6.23	0.0000	10.06	0.0000
	PCBs 40 + 71	4.5500		5.82	5.37	3.77	0.7733	6.16	0.6296	3.86	1.0665
	PCB 41	0.0592	U	5.69	5.35	3.75	0.0000	6.03	0.0000	9.86	0.0000

PW003 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW003

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.34%	RI Calc Total PCB Congeners	796	µg/kg	6.14	5.68
f_{BC}=	0.17%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Note: Used the average fbc for sites 1 - 2, and 4 - 6

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
65.64	ng/L	75.06	ng/L
		Congener OC+BC Porewater Calc.	
		22.08	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 42	1.1500		5.76	5.31	3.71	0.2244	6.10	0.0412	4.45	0.0354
	PCBs 43 + 73	0.0412	U	5.90	5.21	3.60	0.0000	6.24	0.0000	10.07	0.0000
	PCBs 44 + 47 + 65	33.8000		5.82	5.26	3.66	7.4572	6.16	3.0130	4.05	3.0626
	PCBs 45 + 51	21.6000		5.58	5.11	3.50	6.7574	5.92	3.4952	3.79	6.3818
	PCB 46	0.8620		5.53	5.16	3.56	0.2376	5.87	0.0377	4.36	0.0105
	PCB 48	0.0456	U	5.78	5.23	3.63	0.0000	6.12	0.0000	9.95	0.0000
	PCB 49	26.9000		5.85	5.22	3.62	6.4577	6.19	1.8629	4.16	0.9804
	PCBs 50 + 53	15.0000		5.63	5.04	3.44	5.4503	5.96	1.4319	4.02	0.4439
	PCB 52	22.7000		5.84	5.20	3.60	5.7063	6.18	1.7335	4.12	1.3417
	PCB 54	4.1000		5.21	4.94	3.34	1.8755	5.54	0.6217	3.82	0.1097
	PCB 55	0.0525	U	6.11	5.44	3.84	0.0000	6.45	0.0000	10.29	0.0000
	PCB 56	2.1400		6.11	5.47	3.87	0.2889	6.45	0.0349	4.79	0.0314
	PCB 57	0.0389	U	6.17	5.34	3.74	0.0000	6.52	0.0000	10.35	0.0000
	PCB 58	0.0372	U	6.17	5.34	3.74	0.0000	6.52	0.0000	10.35	0.0000
	PCBs 59 + 62 + 75	1.2500		5.96	5.26	3.66	0.2716	6.31	0.0232	4.73	0.0137
	PCB 60	0.2720		6.11	5.47	3.87	0.0367	6.45	0.0023	5.08	0.0027
	PCB 61	0.0402	U	6.04	5.38	3.78	0.0000	6.38	0.0000	10.21	0.0000
	PCB 63	0.2490		6.17	5.37	3.77	0.0423	6.52	0.0000	10.35	0.0000
	PCB 64	1.2500		5.95	5.36	3.76	0.2174	6.29	0.0269	4.67	0.0229
	PCB 66	7.4200		6.20	5.41	3.81	1.1501	6.55	0.1563	4.68	0.1572
	PCB 67	0.0339	U	6.20	5.35	3.75	0.0000	6.55	0.0000	10.38	0.0000
	PCB 68	0.8960		6.26	5.31	3.71	0.1748	6.61	0.0064	5.14	0.0050
	PCB 69	0.0285	U	6.04	5.19	3.59	0.0000	6.38	0.0000	10.21	0.0000
	PCBs 70 + 74 + 76	8.0800		6.18	5.40	3.80	1.2914	6.52	0.1546	4.72	0.0898
	PCB 72	0.4850		6.26	5.29	3.69	0.0991	6.61	0.0000	10.44	0.0000
	PCB 77	0.3170	J	6.13	5.40	3.80	0.0503	6.47	0.0023	5.15	0.0018
	PCB 78	0.0562	U	4.97	4.72	3.12	0.0000	5.30	0.0000	9.13	0.0000
	PCB 79	0.2180		6.42	5.53	3.93	0.0256	6.77	0.0008	5.43	0.0019
	PCB 80	0.0462	U	6.48	5.42	3.82	0.0000	6.83	0.0000	10.66	0.0000
	PCB 81	0.0546	U	6.36	5.59	3.99	0.0000	6.71	0.0000	10.54	0.0000
	PCB 82	0.7490		6.20	5.86	4.26	0.0412	6.55	0.0051	5.17	0.0035
	PCBs 83 + 99	11.5000		6.31	5.68	4.07	0.9683	6.66	0.2177	4.72	0.3623
	PCB 84	2.1900	J	6.04	5.61	4.01	0.2142	6.38	0.0361	4.78	0.0224
	PCB 85	2.2600		6.30	5.78	4.18	0.1494	6.65	0.0236	4.98	0.0358

PW003 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW003

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.34%	RI Calc Total PCB Congeners	796	µg/kg	6.14	5.68
f_{BC}=	0.17%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Note: Used the average fbc for sites 1 - 2, and 4 - 6

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
65.64	ng/L	75.06	ng/L
		Congener OC+BC Porewater Calc.	
		22.08	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCBs 86 + 87 + 97 + 109 + 119 + 125	7.6200		6.37	5.69	4.09	0.6175	6.72	0.0924	4.92	0.0986
	PCB 88	0.0431	U	6.07	5.53	3.93	0.0000	6.41	0.0000	10.24	0.0000
	PCB 89	0.1590	U	6.07	5.63	4.03	0.0000	6.41	0.0000	10.24	0.0000
	PCBs 90 + 101 + 113	24.7000		6.43	5.65	4.05	2.2200	6.78	0.4008	4.79	0.4538
	PCB 91	8.8300		6.13	5.55	3.95	0.9915	6.47	0.2787	4.50	0.6147
	PCB 92	6.4600		6.35	5.61	4.01	0.6318	6.70	0.0923	4.85	0.1438
	PCB 93	0.0435	U	6.04	5.51	3.91	0.0000	6.38	0.0000	10.21	0.0000
	PCB 94	1.2000		6.13	5.47	3.87	0.1620	6.47	0.0143	4.92	0.0116
	PCBs 95 + 100	17.8000		6.18	5.48	3.87	2.3755	6.53	0.5043	4.55	0.4798
	PCB 96	1.3300		5.71	5.38		0.2209		0.2369	3.75	0.3052
	PCBs 98 + 102	0.6850		6.15	5.51	3.90	0.0853	6.49	0.0043	5.20	0.0013
	PCB 103	2.0100		6.22	5.41	3.81	0.3115	6.57	0.0160	5.10	0.0054
	PCB 104	1.1300	J	5.81	5.27	3.67	0.2418	6.15	0.0175	4.81	0.0022
	PCB 105	2.1400		6.65	5.83	4.23	0.1261	7.00	0.0077	5.44	0.0112
	PCB 106	0.1180	U	6.64	5.73	4.13	0.0000	6.99	0.0000	10.82	0.0000
	PCB 107	1.2400	J	6.71	5.72	4.12	0.0941	7.06	0.0033	5.58	0.0059
	PCBs 108 + 124	0.1110	U	6.72	5.72	4.11	0.0000	7.07	0.0000	10.90	0.0000
	PCBs 110 + 115	12.5000		6.49	5.79	4.18	0.8170	6.84	0.1097	5.06	0.0779
	PCB 111	0.1020	U	6.76	5.60	4.00	0.0000	7.12	0.0000	10.95	0.0000
	PCB 112	0.1080	U	6.45	5.70	4.10	0.0000	6.80	0.0000	10.63	0.0000
	PCB 114	0.1100	U	6.65	5.77	4.17	0.0000	7.00	0.0000	10.83	0.0000
	PCBs 117 + 116	0.8270		6.40	5.76	4.15	0.0579	6.74	0.0025	5.52	0.0008
	PCB 118	8.4100		6.74	5.73	4.13	0.6239	7.09	0.0285	5.47	0.0176
	PCB 120	0.1020	U	6.79	5.62	4.02	0.0000	7.15	0.0000	10.98	0.0000
	PCB 121	0.2670		6.64	5.54	3.94	0.0307	6.99	0.0003	5.90	0.0003
	PCB 122	0.1320	U	6.64	5.78	4.18	0.0000	6.99	0.0000	10.82	0.0000
	PCB 123	0.1210	U	6.74	5.73	4.13	0.0000	7.09	0.0000	10.93	0.0000
	PCB 126	0.6480	J	6.89	5.95	4.35	0.0290	7.25	0.0005	6.09	0.0005
	PCB 127	0.1190	U	6.95	5.83	4.23	0.0000	7.31	0.0000	4.58	0.0000
	PCB 128	2.9700		6.74	6.32	4.72	0.0566	7.09	0.0079	5.58	0.0107

PW003 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW003

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.34%	RI Calc Total PCB Congeners	796	µg/kg	6.14	5.68
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Note: Used the average fbc for sites 1 - 2, and 4 - 6

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
65.64	ng/L	75.06	ng/L
		Congener OC+BC Porewater Calc.	
		22.08	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCBs 129 + 138 + 163	46.2000		6.85	6.20	4.60	1.1525	7.21	0.3300	5.15	1.2179
	PCB 130	1.6000	J	6.80	6.15	4.55	0.0451	7.16	0.0024	5.83	0.0018
	PCB 131	0.1190	U	6.58	6.00	4.40	0.0000	6.93	0.0000	10.76	0.0000
	PCB 132	11.7000		6.58	6.06	4.46	0.4060	6.93	0.0735	5.20	0.0636
	PCB 133	2.2700		6.86	6.01	4.41	0.0884	7.22	0.0043	5.72	0.0066
	PCB 134	1.2700		6.55	5.98	4.38	0.0530	6.90	0.0033	5.58	0.0018
	PCBs 135 + 154	5.8000		6.70	5.87	4.26	0.3153	7.05	0.0261	5.35	0.0374
	PCB 136	5.6600		6.22	5.79	4.19	0.3657	6.57	0.0622	4.96	0.0238
	PCB 137	0.5090	J	6.83	6.17	4.57	0.0137	7.19	0.0000	11.02	0.0000
	PCBs 139 + 140	0.5580		6.67	5.95	4.35	0.0249	7.02	0.0000	10.85	0.0000
	PCB 141	9.0000		6.82	6.12	4.52	0.2720	7.18	0.0319	5.45	0.0488
	PCB 142	0.1420	U	6.51	6.00	4.40	0.0000	6.86	0.0000	10.69	0.0000
	PCB 143	0.1350	U	6.60	5.98	4.38	0.0000	6.95	0.0000	10.78	0.0000
	PCB 144	1.3600		6.67	5.90	4.30	0.0682	7.02	0.0048	5.45	0.0130
	PCB 145	0.0354	U	6.25	5.76	4.16	0.0000	6.60	0.0000	10.43	0.0000
	PCB 146	12.3000		6.89	6.04	4.44	0.4469	7.25	0.0394	5.49	0.0541
	PCBs 147 + 149	44.5000		6.66	5.93	4.33	2.0830	7.01	0.4889	4.96	0.9047
	PCB 148	0.8200	J	6.73	5.79	4.19	0.0530	7.08	0.0018	5.66	0.0038
	PCB 150	0.5730		6.32	5.69	4.09	0.0466	6.67	0.0028	5.32	0.0023
	PCB 151	13.8000		6.64	5.88	4.28	0.7248	6.99	0.1081	5.11	0.1883
	PCB 152	0.4400		6.22	5.73	4.13	0.0326	6.57	0.0024	5.27	0.0016
	PCBs 153 + 168	47.8000		7.02	6.07	4.47	1.6209	7.37	0.1291	5.57	0.0792
	PCB 155	0.2370		6.41	5.59	3.99	0.0243	6.76	0.0004	5.81	0.0001
	PCBs 156 + 157	2.6700		7.18	6.11	4.51	0.0826	7.54	0.0020	6.12	0.0035
	PCB 158	2.5700		7.02	6.20	4.60	0.0646	7.38	0.0028	5.97	0.0033
	PCB 159	0.7090		7.24	5.98	4.38	0.0296	7.60	0.0003	6.41	0.0005
	PCB 160	0.0570	U	6.93	6.19	4.59	0.0000	7.29	0.0000	11.12	0.0000
	PCB 161	0.0975	U	7.08	6.04	4.44	0.0000	7.44	0.0000	11.27	0.0000
	PCB 162	0.2920	U	7.24	6.00	4.40	0.0000	7.60	0.0000	11.43	0.0000
	PCB 164	2.8900		7.02	6.19	4.59	0.0743	7.38	0.0020	6.15	0.0008
	PCB 165	0.1010	U	7.05	6.02	4.42	0.0000	7.41	0.0000	11.24	0.0000

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Porewater Station PW003

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# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 166	0.1020	U	6.93	6.25	4.65	0.0000	7.29	0.0000	11.12	0.0000
	PCB 167	0.7960		7.27	6.02	4.42	0.0303	7.63	0.0002	6.52	0.0003
	PCB 169	0.2710	U	7.42	6.23	4.63	0.0000	7.79	0.0000	11.62	0.0000
	PCB 170	26.5000		7.27	6.66	5.06	0.2310	7.63	0.0325	5.91	0.0516
	PCBs 171 + 173	7.7600		7.07	6.44	4.84	0.1123	7.42	0.0098	5.90	0.0095
	PCB 172	4.6900		7.33	6.50	4.90	0.0591	7.69	0.0027	6.24	0.0047
	PCB 174	27.6000		7.11	6.39	4.79	0.4480	7.47	0.0381	5.86	0.0181
	PCB 175	0.6890	J	7.17	6.27	4.67	0.0147	7.53	0.0002	6.46	0.0002
	PCB 176	3.0400		6.76	6.16	4.56	0.0838	7.12	0.0049	5.79	0.0018
	PCB 177	18.6000		7.08	6.41	4.81	0.2883	7.44	0.0291	5.81	0.0229
	PCB 178	5.7700		7.14	6.24	4.64	0.1323	7.50	0.0051	6.05	0.0044
	PCB 179	10.7000		6.73	6.12	4.52	0.3234	7.08	0.0303	5.55	0.0106
	PCBs 180 + 193	57.9000		7.44	6.54	4.93	0.6730	7.81	0.0863	5.83	0.3553
	PCB 181	0.0797	U	7.11	6.39	4.79	0.0000	7.47	0.0000	11.30	0.0000
	PCB 182	0.0541	U	7.20	6.28	4.68	0.0000	7.56	0.0000	11.39	0.0000
	PCB 183	17.3000		7.20	6.30	4.70	0.3454	7.56	0.0117	6.17	0.0029
	PCB 184	0.0353	U	6.85	6.06	4.46	0.0000	7.21	0.0000	11.04	0.0000
	PCB 185	3.6600		7.11	6.35	4.75	0.0651	7.47	0.0019	6.30	0.0005
	PCB 186	0.0391	U	6.69	6.20	4.60	0.0000	7.04	0.0000	10.87	0.0000
	PCB 187	30.0000		7.17	6.28	4.68	0.6273	7.53	0.0324	5.97	0.0114
	PCB 188	0.5050		6.82	6.02	4.42	0.0192	7.18	0.0002	6.37	0.0000
	PCB 189	0.5980	J	7.71	6.37	4.77	0.0102	8.08	0.0000	7.24	0.0000
	PCB 190	5.8300		7.46	6.66	5.06	0.0508	7.83	0.0016	6.55	0.0011
	PCB 191	0.9370		7.55	6.56	4.96	0.0103	7.92	0.0001	6.84	0.0002
	PCB 192	0.0701	U	7.52	6.49	4.89	0.0000	7.89	0.0000	11.72	0.0000
	PCB 194	13.1000		7.80	6.96	5.36	0.0572	8.17	0.0031	6.63	0.0100
	PCB 195	5.5100		7.56	6.86	5.26	0.0303	7.93	0.0016	6.54	0.0030
	PCB 196	7.4700		7.65	6.73	5.13	0.0554	8.02	0.0020	6.57	0.0045
	PCB 197	0.5810		7.30	6.50	4.90	0.0073	7.66	0.0001	6.67	0.0001
	PCBs 198 + 199	12.8000		7.41	6.63	5.03	0.1195	7.78	0.0074	6.24	0.0097
	PCB 200	1.5100		7.27	6.47	4.87	0.0204	7.63	0.0005	6.47	0.0005
	PCB 201	1.7600		7.62	6.71	5.11	0.0137	7.99	0.0003	6.80	0.0006
	PCB 202	2.2800		7.24	6.43	4.83	0.0337	7.60	0.0010	6.37	0.0009
	PCB 203	7.2900		7.65	6.73	5.13	0.0541	8.02	0.0020	6.57	0.0044
	PCB 204	0.0435	U	7.30	6.48	4.88	0.0000	7.66	0.0000	11.49	0.0000

PW003 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW003

f_{TOC}=	2.51%		Concentration		log Kow	log Koc
f_{OC}=	2.34%	RI Calc Total PCB Congeners	796	µg/kg	6.14	5.68
f_{BC}=	0.17%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Note: Used the average fbc for sites 1 - 2, and 4 - 6

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
65.64	ng/L	75.06	ng/L
		Congener OC+BC Porewater Calc.	
		22.08	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 205	0.6360		8.00	6.99	5.39	0.0026	8.37	0.0000	7.37	0.0001
	PCB 206	3.5900		8.09	7.13	5.53	0.0106	8.47	0.0003	7.14	0.0016
	PCB 207	0.4820		7.74	6.90	5.30	0.0024	8.11	0.0000	7.15	0.0001
	PCB 208	0.5670		7.71	6.86	5.26	0.0031	8.08	0.0000	11.91	0.0000
	PCB 209	0.4610		8.18	7.27	5.67	0.0010	8.56	0.0000	12.39	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

f_{TOC}=	1.26%		Concentration		log Kow	log Koc
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.1730		4.46	4.40	2.50	0.5466	4.78	0.0000	8.28	0.0000
	PCB 2	0.0143	U	4.69	4.51	2.61	0.0000	5.01	0.0000	8.52	0.0000
	PCB 3	0.0323	J	4.69	4.52	2.62	0.0774	5.01	0.0000	8.52	0.0000
	PCB 4	31.4000		4.65	4.40	2.50	99.2108	4.97	0.0001	8.47	0.0000
	PCB 5	0.0683	U	4.97	4.72	2.82	0.0000	5.30	0.0000	8.80	0.0000
	PCB 6	0.3290		5.06	4.71	2.81	0.5091	5.39	0.0000	8.89	0.0000
	PCB 7	0.0631	U	5.07	4.67	2.77	0.0000	5.40	0.0000	8.90	0.0000
	PCB 8	0.5830		5.07	4.72	2.82	0.8817	5.40	0.0000	8.90	0.0000
	PCB 9	0.0692	U	5.06	4.67	2.77	0.0000	5.39	0.0000	8.89	0.0000
	PCB 10	0.4510		4.84	4.40	2.50	1.4250	5.16	0.0000	8.67	0.0000
	PCB 11	0.8620		5.28	4.84	2.94	0.9889	5.61	0.0000	9.11	0.0000
	PCBs 12 + 13	0.0691	U	5.26	4.86	2.96	0.0000	5.59	0.0000	9.09	0.0000
	PCB 14	0.0698	U	5.28	4.77	2.87	0.0000	5.61	0.0000	9.11	0.0000
	PCB 15	0.3060		5.30	4.88	2.98	0.3201	5.63	0.0000	9.13	0.0000
	PCB 16	0.0665	U	5.16	4.88	2.98	0.0000	5.49	0.0000	8.99	0.0000
	PCB 17	37.1000		5.25	4.80	2.90	46.6663	5.58	32.9921	3.05	47.9458
	PCB 18	0.0414	U	5.24	4.79	2.89	0.0000	5.57	0.0000	9.07	0.0000
	PCB 19	95.9000	J	5.02	4.67	2.77	162.7227	5.35	123.4443	2.89	45.7937
	PCBs 20 + 28	12.2000		5.62	5.07	3.17	8.3366	5.96	3.7389	3.51	4.0703
	PCBs 21 + 33	3.3800		5.56	5.08	3.18	2.2571	5.89	0.9376	3.56	1.4790
	PCB 22	0.2320	U	5.58	5.11	3.21	0.0000	5.92	0.0000	9.42	0.0000
	PCB 23	0.2210	U	5.57	4.98	3.08	0.0000	5.91	0.0000	9.41	0.0000
	PCB 24	0.0388	U	5.35	4.84	2.94	0.0000	5.68	0.0000	9.19	0.0000
	PCB 25	1.6200		5.67	5.02	3.12	1.2278	6.01	0.3188	3.71	0.5655
	PCBs 26 + 29	2.5600		5.63	5.01	3.11	2.0085	5.97	0.4702	3.74	0.2965
	PCB 27	8.2400		5.44	4.79	2.89	10.6061	5.77	3.2953	3.40	1.2429
	PCB 30	4.6800		5.44	4.72	2.82	7.0774	5.77	1.6668	3.45	0.6160
	PCB 31	2.8500		5.67	5.04	3.14	2.0629	6.01	0.5132	3.74	0.4022
	PCB 32	12.8000		5.44	4.88	2.98	13.3918	5.77	5.3216	3.38	2.1217
	PCB 34	0.2550		5.66	4.98	3.08	0.2119	6.00	0.0000	9.50	0.0000
	PCB 35	0.2490	U	5.82	5.23	3.33	0.0000	6.16	0.0000	9.66	0.0000
	PCB 36	0.2300	U	5.88	5.15	3.25	0.0000	6.22	0.0000	9.72	0.0000
	PCB 37	0.2760	U	5.83	5.26	3.36	0.0000	6.17	0.0000	9.67	0.0000
	PCB 38	0.2560	U	5.76	5.19	3.29	0.0000	6.10	0.0000	9.60	0.0000
	PCB 39	0.2180	U	5.89	5.16	3.26	0.0000	6.23	0.0000	9.73	0.0000

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

f_{TOC}=	1.26%		Concentration		log Kow	log Koc
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCBs 40 + 71	15.1000		5.82	5.37	3.47	5.1122	6.16	4.2110	3.55	7.1175
	PCB 41	0.0657	U	5.69	5.35	3.45	0.0000	6.03	0.0000	9.53	0.0000
	PCB 42	2.2800		5.76	5.31	3.41	0.8863	6.10	0.2664	3.93	0.2388
	PCBs 43 + 73	0.0457	U	5.90	5.21	3.31	0.0000	6.24	0.0000	9.74	0.0000
	PCBs 44 + 47 + 65	148.0000		5.82	5.26	3.36	65.0466	6.16	40.8974	3.56	43.1558
	PCBs 45 + 51	110.0000		5.58	5.11	3.21	68.5523	5.92	50.0102	3.34	83.2727
	PCB 46	5.1300		5.53	5.16	3.26	2.8167	5.87	1.0275	3.70	0.3203
	PCB 48	0.0506	U	5.78	5.23	3.33	0.0000	6.12	0.0000	9.62	0.0000
	PCB 49	91.1000		5.85	5.22	3.32	43.5660	6.19	21.2099	3.63	12.1114
	PCBs 50 + 53	105.0000		5.63	5.04	3.14	76.0009	5.96	40.1474	3.42	14.0085
	PCB 52	117.0000		5.84	5.20	3.30	58.5889	6.18	31.4402	3.57	24.3562
	PCB 54	24.5000		5.21	4.94	3.04	22.3252	5.54	13.3893	3.26	2.9091
	PCB 55	0.0583	U	6.11	5.44	3.54	0.0000	6.45	0.0000	9.96	0.0000
	PCB 56	0.2390		6.11	5.47	3.57	0.0643	6.45	0.0048	4.70	0.0042
	PCB 57	0.0431		6.17	5.34	3.44	0.0156	6.52	0.0000	10.02	0.0000
	PCB 58	0.0413	U	6.17	5.34	3.44	0.0000	6.52	0.0000	10.02	0.0000
	PCBs 59 + 62 + 75	3.5400		5.96	5.26	3.36	1.5321	6.31	0.2661	4.12	0.1608
	PCB 60	0.0431	U	6.11	5.47	3.57	0.0000	6.45	0.0000	9.96	0.0000
	PCB 61	0.0446	U	6.04	5.38	3.48	0.0000	6.38	0.0000	9.89	0.0000
	PCB 63	0.0426	U	6.17	5.37	3.47	0.0000	6.52	0.0000	10.02	0.0000
	PCB 64	0.9570		5.95	5.36	3.46	0.3315	6.29	0.0516	4.27	0.0446
	PCB 66	3.0400		6.20	5.41	3.51	0.9386	6.55	0.1280	4.38	0.1288
	PCB 67	0.0377	U	6.20	5.35	3.45	0.0000	6.55	0.0000	10.05	0.0000
	PCB 68	0.5900	J	6.26	5.31	3.41	0.2293	6.61	0.0103	4.76	0.0079
	PCB 69	0.0316		6.04	5.19	3.29	0.0162	6.38	0.0000	9.89	0.0000
	PCBs 70 + 74 + 76	2.7100		6.18	5.40	3.50	0.8628	6.52	0.0963	4.45	0.0558
	PCB 72	0.0393	U	6.26	5.29	3.39	0.0000	6.61	0.0000	10.11	0.0000
	PCB 77	0.0480	J	6.13	5.40	3.50	0.0152	6.47	0.0005	5.02	0.0004
	PCB 78	0.0462	U	4.97	4.72	2.82	0.0000	5.30	0.0000	8.80	0.0000
	PCB 79	0.0409	U	6.42	5.53	3.63	0.0000	6.77	0.0000	10.27	0.0000
	PCB 80	0.0380	U	6.48	5.42	3.52	0.0000	6.83	0.0000	10.33	0.0000
	PCB 81	0.0475	U	6.36	5.59	3.69	0.0000	6.71	0.0000	10.21	0.0000

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

f_{TOC}=	1.26%		Concentration		log Kow	log Koc
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 82	0.1200	U	6.20	5.86	3.96	0.0000	6.55	0.0000	10.05	0.0000
	PCBs 83 + 99	8.3200		6.31	5.68	3.78	1.3956	6.66	0.3721	4.35	0.6133
	PCB 84	1.7200		6.04	5.61	3.71	0.3351	6.38	0.0705	4.39	0.0445
	PCB 85	1.6500		6.30	5.78	3.88	0.2173	6.65	0.0418	4.60	0.0637
	PCBs 86 + 87 + 97 + 109 + 119 + 125	6.7800		6.37	5.69	3.79	1.0944	6.72	0.2137	4.50	0.2295
	PCB 88	0.0340		6.07	5.53	3.63	0.0080	6.41	0.0000	9.92	0.0000
	PCB 89	0.1020		6.07	5.63	3.73	0.0190	6.41	0.0000	9.92	0.0000
	PCBs 90 + 101 + 113	15.5000		6.43	5.65	3.75	2.7752	6.78	0.5780	4.43	0.6574
	PCB 91	20.4000		6.13	5.55	3.65	4.5631	6.47	1.9442	4.02	3.9296
	PCB 92	4.0600		6.35	5.61	3.71	0.7910	6.70	0.1340	4.48	0.2076
	PCB 93	0.0343		6.04	5.51	3.61	0.0084	6.38	0.0000	9.89	0.0000
	PCB 94	2.4000		6.13	5.47	3.57	0.6454	6.47	0.1024	4.37	0.0846
	PCBs 95 + 100	32.0000		6.18	5.48	3.58	8.5071	6.53	2.8000	4.06	2.7317
	PCB 96	6.2500		5.71	5.38		2.0678		2.2080	3.45	2.8444
	PCBs 98 + 102	1.7400		6.15	5.51	3.61	0.4317	6.49	0.0445	4.59	0.0141
	PCB 103	6.0400		6.22	5.41	3.51	1.8649	6.57	0.2091	4.46	0.0719
	PCB 104	3.0500		5.81	5.27	3.37	1.3000	6.15	0.1939	4.20	0.0254
	PCB 105	0.5360	J	6.65	5.83	3.93	0.0629	7.00	0.0032	5.23	0.0046
	PCB 106	0.1170	U	6.64	5.73	3.83	0.0000	6.99	0.0000	10.50	0.0000
	PCB 107	0.5570		6.71	5.72	3.82	0.0842	7.06	0.0031	5.26	0.0055
	PCBs 108 + 124	0.1100	U	6.72	5.72	3.82	0.0000	7.07	0.0000	10.58	0.0000
	PCBs 110 + 115	5.0100		6.49	5.79	3.89	0.6523	6.84	0.0872	4.76	0.0620
	PCB 111	0.0653		6.76	5.60	3.70	0.0130	7.12	0.0000	10.62	0.0000
	PCB 112	0.0690	U	6.45	5.70	3.80	0.0000	6.80	0.0000	10.30	0.0000
	PCB 114	0.1030	U	6.65	5.77	3.87	0.0000	7.00	0.0000	10.51	0.0000
	PCBs 117 + 116	1.8200		6.40	5.76	3.86	0.2539	6.74	0.0214	4.93	0.0070
	PCB 118	1.9900		6.74	5.73	3.83	0.2941	7.09	0.0108	5.27	0.0066
	PCB 120	0.0653	U	6.79	5.62	3.72	0.0000	7.15	0.0000	10.65	0.0000
	PCB 121	0.6960		6.64	5.54	3.64	0.1593	6.99	0.0037	5.27	0.0028

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

f_{TOC}=	1.26%		Concentration		log Kow	log Koc
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 122	0.1300	U	6.64	5.78	3.88	0.0000	6.99	0.0000	10.50	0.0000
	PCB 123	0.1010	U	6.74	5.73	3.83	0.0000	7.09	0.0000	10.60	0.0000
	PCB 126	0.3160	J	6.89	5.95	4.05	0.0281	7.25	0.0006	5.75	0.0005
	PCB 127	0.1180		6.95	5.83	3.93	0.0139	7.31	0.0064	4.27	0.0075
	PCB 128	0.5650		6.74	6.32	4.42	0.0215	7.09	0.0023	5.40	0.0030
	PCBs 129 + 138 + 163	20.0000		6.85	6.20	4.30	0.9939	7.21	0.2893	4.84	1.0641
	PCB 130	0.3650		6.80	6.15	4.25	0.0205	7.16	0.0009	5.60	0.0009
	PCB 131	0.0422	U	6.58	6.00	4.10	0.0000	6.93	0.0000	10.44	0.0000
	PCB 132	3.5700		6.58	6.06	4.16	0.2468	6.93	0.0405	4.95	0.0348
	PCB 133	1.4200		6.86	6.01	4.11	0.1101	7.22	0.0064	5.35	0.0098
	PCB 134	0.5550		6.55	5.98	4.08	0.0461	6.90	0.0030	5.27	0.0016
	PCBs 135 + 154	3.5100	J	6.70	5.87	3.97	0.3801	7.05	0.0364	4.98	0.0515
	PCB 136	5.8200		6.22	5.79	3.89	0.7491	6.57	0.1740	4.52	0.0690
	PCB 137	0.2580		6.83	6.17	4.27	0.0138	7.19	0.0009	5.46	0.0034
	PCBs 139 + 140	0.0431	U	6.67	5.95	4.05	0.0000	7.02	0.0000	10.53	0.0000
	PCB 141	2.1200		6.82	6.12	4.22	0.1276	7.18	0.0122	5.24	0.0187
	PCB 142	0.0503	U	6.51	6.00	4.10	0.0000	6.86	0.0000	10.36	0.0000
	PCB 143	0.0481	U	6.60	5.98	4.08	0.0000	6.95	0.0000	10.46	0.0000
	PCB 144	0.2930	J	6.67	5.90	4.00	0.0293	7.02	0.0016	5.26	0.0044
	PCB 145	0.0295	U	6.25	5.76	3.86	0.0000	6.60	0.0000	10.10	0.0000
	PCB 146	4.9200		6.89	6.04	4.14	0.3561	7.25	0.0312	5.20	0.0429
	PCBs 147 + 149	27.3000		6.66	5.93	4.03	2.5456	7.01	0.6768	4.61	1.2598
	PCB 148	0.5620	J	6.73	5.79	3.89	0.0723	7.08	0.0031	5.26	0.0064
	PCB 150	1.5300		6.32	5.69	3.79	0.2479	6.67	0.0305	4.70	0.0257
	PCB 151	7.5900		6.64	5.88	3.98	0.7941	6.99	0.1316	4.76	0.2296
	PCB 152	0.0328	U	6.22	5.73	3.83	0.0000	6.57	0.0000	10.07	0.0000
	PCBs 153 + 168	17.4000		7.02	6.07	4.17	1.1754	7.37	0.0898	5.29	0.0550
	PCB 155	0.3000	J	6.41	5.59	3.69	0.0612	6.76	0.0015	5.30	0.0004
	PCBs 156 + 157	0.7360		7.18	6.11	4.21	0.0453	7.54	0.0010	5.89	0.0017

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

f_{TOC}=	1.26%		Concentration		log Kow	log Koc
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 158	0.7600		7.02	6.20	4.30	0.0381	7.38	0.0014	5.73	0.0017
	PCB 159	0.1960	J	7.24	5.98	4.08	0.0163	7.60	0.0001	6.19	0.0003
	PCB 160	0.0203	U	6.93	6.19	4.29	0.0000	7.29	0.0000	10.79	0.0000
	PCB 161	0.0348	U	7.08	6.04	4.14	0.0000	7.44	0.0000	10.94	0.0000
	PCB 162	0.1140		7.24	6.00	4.10	0.0090	7.60	0.0000	11.11	0.0000
	PCB 164	0.8220		7.02	6.19	4.29	0.0421	7.38	0.0010	5.91	0.0004
	PCB 165	0.2000	J	7.05	6.02	4.12	0.0152	7.41	0.0000	10.91	0.0000
	PCB 166	0.0363	U	6.93	6.25	4.35	0.0000	7.29	0.0000	10.79	0.0000
	PCB 167	0.2590		7.27	6.02	4.12	0.0196	7.63	0.0001	6.27	0.0002
	PCB 169	0.1770	J	7.42	6.23	4.33	0.0083	7.79	0.0000	11.29	0.0000
	PCB 170	9.3300		7.27	6.66	4.76	0.1620	7.63	0.0217	5.63	0.0344
	PCBs 171 + 173	2.7400		7.07	6.44	4.54	0.0790	7.42	0.0065	5.62	0.0064
	PCB 172	1.7700		7.33	6.50	4.60	0.0444	7.69	0.0020	5.95	0.0035
	PCB 174	8.2500		7.11	6.39	4.49	0.2667	7.47	0.0202	5.61	0.0096
	PCB 175	0.2280		7.17	6.27	4.37	0.0097	7.53	0.0001	6.20	0.0001
	PCB 176	0.9270		6.76	6.16	4.26	0.0509	7.12	0.0027	5.54	0.0010
	PCB 177	6.8000		7.08	6.41	4.51	0.2100	7.44	0.0204	5.52	0.0160
	PCB 178	2.8500		7.14	6.24	4.34	0.1302	7.50	0.0054	5.72	0.0047
	PCB 179	4.6700		6.73	6.12	4.22	0.2812	7.08	0.0271	5.24	0.0095
	PCBs 180 + 193	20.6000		7.44	6.54	4.64	0.4770	7.81	0.0584	5.55	0.2407
	PCB 181	0.0498	U	7.11	6.39	4.49	0.0000	7.47	0.0000	10.97	0.0000
	PCB 182	0.0385	U	7.20	6.28	4.38	0.0000	7.56	0.0000	11.07	0.0000
	PCB 183	5.8000		7.20	6.30	4.40	0.2307	7.56	0.0072	5.90	0.0018
	PCB 184	0.0251	U	6.85	6.06	4.16	0.0000	7.21	0.0000	10.71	0.0000
	PCB 185	1.1500		7.11	6.35	4.45	0.0408	7.47	0.0010	6.04	0.0003
	PCB 186	0.0278	U	6.69	6.20	4.30	0.0000	7.04	0.0000	10.55	0.0000
	PCB 187	12.4000		7.17	6.28	4.38	0.5165	7.53	0.0269	5.66	0.0094
	PCB 188	0.5980		6.82	6.02	4.12	0.0453	7.18	0.0008	5.85	0.0001
	PCB 189	0.2630		7.71	6.37	4.47	0.0089	8.08	0.0000	6.90	0.0000
	PCB 190	2.2200		7.46	6.66	4.76	0.0385	7.83	0.0012	6.27	0.0008
	PCB 191	0.4140		7.55	6.56	4.66	0.0090	7.92	0.0001	6.52	0.0002
	PCB 192	0.0438	U	7.52	6.49	4.59	0.0000	7.89	0.0000	11.39	0.0000
	PCB 194	6.5300		7.80	6.96	5.06	0.0568	8.17	0.0033	6.29	0.0107

PW004 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	1.26%					
f_{OC}=	1.18%	RI Calc Total PCB Congeners	1180	µg/kg	6.14	5.68
f_{BC}=	0.08%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
193.84	ng/L	746.19	ng/L
		Congener OC+BC Porewater Calc.	
		307.30	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 195	2.7000		7.56	6.86	4.96	0.0296	7.93	0.0017	6.21	0.0031
	PCB 196	3.6300		7.65	6.73	4.83	0.0536	8.02	0.0021	6.24	0.0047
	PCB 197	0.2630		7.30	6.50	4.60	0.0066	7.66	0.0001	6.35	0.0001
	PCBs 198 + 199	5.9700		7.41	6.63	4.73	0.1111	7.78	0.0073	5.91	0.0095
	PCB 200	0.7090		7.27	6.47	4.57	0.0191	7.63	0.0005	6.14	0.0005
	PCB 201	0.7690		7.62	6.71	4.81	0.0119	7.99	0.0003	6.48	0.0005
	PCB 202	1.2400		7.24	6.43	4.53	0.0366	7.60	0.0012	6.01	0.0010
	PCB 203	3.4200		7.65	6.73	4.83	0.0505	8.02	0.0019	6.25	0.0044
	PCB 204	0.0303	U	7.30	6.48	4.58	0.0000	7.66	0.0000	11.17	0.0000
	PCB 205	0.3240		8.00	6.99	5.09	0.0026	8.37	0.0000	7.02	0.0002
	PCB 206	1.9400		8.09	7.13	5.23	0.0114	8.47	0.0003	6.79	0.0020
	PCB 207	0.2590		7.74	6.90	5.00	0.0026	8.11	0.0000	6.80	0.0001
	PCB 208	0.3300	U	7.71	6.86	4.96	0.0000	8.08	0.0000	11.58	0.0000
	PCB 209	0.1470	U	8.18	7.27	5.37	0.0000	8.56	0.0000	12.06	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.1820		4.46	4.40	2.43	0.6835	4.78	0.0000	8.58	0.0000
	PCB 2	0.0250	U	4.69	4.51	2.54	0.0000	5.01	0.0000	8.82	0.0000
	PCB 3	0.0432	J	4.69	4.52	2.55	0.1231	5.01	0.0000	8.82	0.0000
	PCB 4	29.6000		4.65	4.40	2.43	111.1695	4.97	0.0000	8.78	0.0000
	PCB 5	0.0679	U	4.97	4.72	2.75	0.0000	5.30	0.0000	9.10	0.0000
	PCB 6	0.2960		5.06	4.71	2.74	0.5445	5.39	0.0000	9.19	0.0000
	PCB 7	0.1640		5.07	4.67	2.70	0.3308	5.40	0.0000	9.20	0.0000
	PCB 8	0.8790		5.07	4.72	2.75	1.5801	5.40	0.0000	9.20	0.0000
	PCB 9	0.0687	U	5.06	4.67	2.70	0.0000	5.39	0.0000	9.19	0.0000
	PCB 10	0.1500	U	4.84	4.40	2.43	0.0000	5.16	0.0000	8.97	0.0000
	PCB 11	1.4100		5.28	4.84	2.87	1.9227	5.61	0.0000	9.42	0.0000
	PCBs 12 + 13	0.0687	U	5.26	4.86	2.89	0.0000	5.59	0.0000	9.39	0.0000
	PCB 14	0.0694	U	5.28	4.77	2.80	0.0000	5.61	0.0000	9.42	0.0000
	PCB 15	0.1360		5.30	4.88	2.91	0.1691	5.63	0.0000	9.44	0.0000
	PCB 16	0.2570	J	5.16	4.88	2.91	0.3196	5.49	0.0000	9.29	0.0000
	PCB 17	50.5000		5.25	4.80	2.83	75.5067	5.58	39.5572	3.11	60.4938
	PCB 18	0.0239	U	5.24	4.79	2.82	0.0000	5.57	0.0000	9.37	0.0000
	PCB 19	116.0000	J	5.02	4.67	2.70	233.9657	5.35	133.8025	2.94	47.1402
	PCBs 20 + 28	12.4000		5.62	5.07	3.09	10.0720	5.96	2.2520	3.74	2.3536
	PCBs 21 + 33	4.2500		5.56	5.08	3.10	3.3735	5.89	0.7202	3.77	1.0868
	PCB 22	0.1380		5.58	5.11	3.14	0.1011	5.92	0.0000	9.72	0.0000
	PCB 23	0.0437	U	5.57	4.98	3.01	0.0000	5.91	0.0000	9.71	0.0000
	PCB 24	0.0224	U	5.35	4.84	2.87	0.0000	5.68	0.0000	9.49	0.0000
	PCB 25	1.0700		5.67	5.02	3.05	0.9640	6.01	0.0862	4.09	0.1492
	PCBs 26 + 29	1.7100		5.63	5.01	3.03	1.5947	5.97	0.1271	4.13	0.0811
	PCB 27	10.9000		5.44	4.79	2.82	16.6771	5.77	2.4363	3.65	0.8904
	PCB 30	4.0300		5.44	4.72	2.75	7.2443	5.77	0.6521	3.79	0.2542
	PCB 31	2.4100		5.67	5.04	3.07	2.0735	6.01	0.1962	4.09	0.1572
	PCB 32	13.4000		5.44	4.88	2.91	16.6648	5.77	3.1029	3.64	1.1434
	PCB 34	0.0503	U	5.66	4.98	3.01	0.0000	6.00	0.0000	9.80	0.0000
	PCB 35	0.0493	U	5.82	5.23	3.26	0.0000	6.16	0.0000	9.96	0.0000
	PCB 36	1.1500		5.88	5.15	3.18	0.7681	6.22	0.0000	10.03	0.0000
	PCB 37	0.1170		5.83	5.26	3.29	0.0607	6.17	0.0000	9.97	0.0000
	PCB 38	0.0506	U	5.76	5.19	3.22	0.0000	6.10	0.0000	9.90	0.0000
	PCB 39	0.0430	U	5.89	5.16	3.19	0.0000	6.23	0.0000	10.04	0.0000
	PCBs 40 + 71	9.8800		5.82	5.37	3.40	3.9760	6.16	2.6352	3.57	4.6325

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 41	0.0319	U	5.69	5.35	3.38	0.0000	6.03	0.0000	9.83	0.0000
	PCB 42	1.1100		5.76	5.31	3.34	0.5129	6.10	0.0488	4.36	0.0406
	PCBs 43 + 73	0.0222	U	5.90	5.21	3.23	0.0000	6.24	0.0000	10.04	0.0000
	PCBs 44 + 47 + 65	141.0000		5.82	5.26	3.28	73.6625	6.16	28.2085	3.70	28.4202
	PCBs 45 + 51	102.0000		5.58	5.11	3.13	75.5604	5.92	39.3102	3.41	73.2001
	PCB 46	1.7900		5.53	5.16	3.19	1.1683	5.87	0.1263	4.15	0.0341
	PCB 48	0.0246	U	5.78	5.23	3.26	0.0000	6.12	0.0000	9.92	0.0000
	PCB 49	48.2000		5.85	5.22	3.25	27.3994	6.19	5.5018	3.94	2.7810
	PCBs 50 + 53	50.3000		5.63	5.04	3.07	43.2775	5.96	9.6363	3.72	2.9145
	PCB 52	41.0000		5.84	5.20	3.23	24.4050	6.18	5.2919	3.89	4.0942
	PCB 54	27.7000		5.21	4.94	2.97	30.0036	5.54	10.5680	3.42	1.8509
	PCB 55	0.0283	U	6.11	5.44	3.47	0.0000	6.45	0.0000	10.26	0.0000
	PCB 56	0.2020		6.11	5.47	3.50	0.0646	6.45	0.0015	5.13	0.0013
	PCB 57	0.0209	U	6.17	5.34	3.37	0.0000	6.52	0.0000	10.32	0.0000
	PCB 58	0.0200	U	6.17	5.34	3.37	0.0000	6.52	0.0000	10.32	0.0000
	PCBs 59 + 62 + 75	3.6200		5.96	5.26	3.29	1.8624	6.31	0.1197	4.48	0.0699
	PCB 60	0.0422	U	6.11	5.47	3.50	0.0000	6.45	0.0000	10.26	0.0000
	PCB 61	0.0217	U	6.04	5.38	3.41	0.0000	6.38	0.0000	10.19	0.0000
	PCB 63	0.2200		6.17	5.37	3.40	0.0885	6.52	0.0000	10.32	0.0000
	PCB 64	0.6960		5.95	5.36	3.39	0.2866	6.29	0.0140	4.70	0.0116
	PCB 66	3.2000		6.20	5.41	3.44	1.1745	6.55	0.0584	4.74	0.0585
	PCB 67	0.0183	U	6.20	5.35	3.38	0.0000	6.55	0.0000	10.35	0.0000
	PCB 68	0.7800		6.26	5.31	3.34	0.3604	6.61	0.0060	5.12	0.0047
	PCB 69	0.0154	U	6.04	5.19	3.22	0.0000	6.38	0.0000	10.19	0.0000
	PCBs 70 + 74 + 76	2.3700		6.18	5.40	3.42	0.8970	6.52	0.0328	4.86	0.0187
	PCB 72	0.1980	J	6.26	5.29	3.32	0.0958	6.61	0.0000	10.41	0.0000
	PCB 77	0.1120	J	6.13	5.40	3.43	0.0421	6.47	0.0006	5.28	0.0005
	PCB 78	0.0452	U	4.97	4.72	2.75	0.0000	5.30	0.0000	9.10	0.0000
	PCB 79	0.0400	U	6.42	5.53	3.56	0.0000	6.77	0.0000	10.57	0.0000
	PCB 80	0.0372	U	6.48	5.42	3.45	0.0000	6.83	0.0000	10.63	0.0000
	PCB 81	0.0846	J	6.36	5.59	3.62	0.0205	6.71	0.0000	10.51	0.0000
	PCB 82	0.1160	U	6.20	5.86	3.89	0.0000	6.55	0.0000	10.35	0.0000
	PCBs 83 + 99	13.5000		6.31	5.68	3.70	2.6917	6.66	0.3561	4.58	0.6069

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 84	1.3200		6.04	5.61	3.64	0.3057	6.38	0.0219	4.78	0.0131
	PCB 85	0.0969	U	6.30	5.78	3.81	0.0000	6.65	0.0000	10.45	0.0000
	PCBs 86 + 87 + 97 + 109 + 119 + 125	9.3400		6.37	5.69	3.72	1.7921	6.72	0.1498	4.79	0.1584
	PCB 88	0.0276	U	6.07	5.53	3.56	0.0000	6.41	0.0000	10.22	0.0000
	PCB 89	0.0982	U	6.07	5.63	3.66	0.0000	6.41	0.0000	10.22	0.0000
	PCBs 90 + 101 + 113	21.5000		6.43	5.65	3.67	4.5758	6.78	0.4135	4.72	0.4614
	PCB 91	23.8000		6.13	5.55	3.58	6.3281	6.47	1.4486	4.22	3.3456
	PCB 92	5.3100		6.35	5.61	3.64	1.2297	6.70	0.0866	4.79	0.1376
	PCB 93	0.0278	U	6.04	5.51	3.54	0.0000	6.38	0.0000	10.19	0.0000
	PCB 94	2.9400		6.13	5.47	3.50	0.9398	6.47	0.0585	4.70	0.0470
	PCBs 95 + 100	33.5000		6.18	5.48	3.50	10.5862	6.53	1.5313	4.34	1.4325
	PCB 96	3.7100		5.71	5.38		1.4590		1.7184	3.33	2.2138
	PCBs 98 + 102	2.1900		6.15	5.51	3.53	0.6459	6.49	0.0250	4.94	0.0078
	PCB 103	5.3700		6.22	5.41	3.44	1.9709	6.57	0.0728	4.87	0.0245
	PCB 104	3.2200		5.81	5.27	3.30	1.6314	6.15	0.0877	4.56	0.0108
	PCB 105	0.4800	J	6.65	5.83	3.86	0.0670	7.00	0.0011	5.65	0.0016
	PCB 106	0.0212	U	6.64	5.73	3.76	0.0000	6.99	0.0000	10.80	0.0000
	PCB 107	0.9190		6.71	5.72	3.75	0.1652	7.06	0.0024	5.58	0.0044
	PCBs 108 + 124	0.0593	J	6.72	5.72	3.74	0.0108	7.07	0.0000	10.88	0.0000
	PCBs 110 + 115	5.9200		6.49	5.79	3.81	0.9163	6.84	0.0462	5.11	0.0319
	PCB 111	0.1390		6.76	5.60	3.63	0.0329	7.12	0.0000	10.92	0.0000
	PCB 112	0.0665	U	6.45	5.70	3.73	0.0000	6.80	0.0000	10.60	0.0000
	PCB 114	0.1090		6.65	5.77	3.80	0.0175	7.00	0.0000	10.81	0.0000
	PCBs 117 + 116	2.6700		6.40	5.76	3.78	0.4428	6.74	0.0147	5.26	0.0047
	PCB 118	2.2700		6.74	5.73	3.76	0.3988	7.09	0.0050	5.66	0.0031
	PCB 120	0.3690		6.79	5.62	3.65	0.0835	7.15	0.0000	10.95	0.0000
	PCB 121	0.8880		6.64	5.54	3.57	0.2416	6.99	0.0020	5.64	0.0016
	PCB 122	0.0549	J	6.64	5.78	3.81	0.0086	6.99	0.0000	10.80	0.0000
	PCB 123	0.0211	U	6.74	5.73	3.76	0.0000	7.09	0.0000	10.90	0.0000
	PCB 126	0.7290	J	6.89	5.95	3.98	0.0772	7.25	0.0007	6.02	0.0006

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 127	0.0229	J	6.95	5.83	3.86	0.0032	7.31	0.0008	4.43	0.0013
	PCB 128	0.8310		6.74	6.32	4.35	0.0375	7.09	0.0016	5.72	0.0020
	PCBs 129 + 138 + 163	24.7000		6.85	6.20	4.23	1.4590	7.21	0.1998	5.09	0.8079
	PCB 130	0.5870		6.80	6.15	4.18	0.0392	7.16	0.0007	5.92	0.0007
	PCB 131	0.2130	U	6.58	6.00	4.03	0.0000	6.93	0.0000	10.74	0.0000
	PCB 132	4.5300		6.58	6.06	4.09	0.3722	6.93	0.0243	5.27	0.0201
	PCB 133	2.3000		6.86	6.01	4.04	0.2120	7.22	0.0050	5.66	0.0077
	PCB 134	1.1300		6.55	5.98	4.01	0.1116	6.90	0.0032	5.55	0.0017
	PCBs 135 + 154	6.7000		6.70	5.87	3.89	0.8625	7.05	0.0378	5.25	0.0565
	PCB 136	6.9900		6.22	5.79	3.82	1.0695	6.57	0.1020	4.84	0.0373
	PCB 137	0.5720		6.83	6.17	4.20	0.0365	7.19	0.0011	5.71	0.0042
	PCBs 139 + 140	0.5600		6.67	5.95	3.98	0.0593	7.02	0.0000	10.83	0.0000
	PCB 141	3.8600		6.82	6.12	4.15	0.2762	7.18	0.0116	5.52	0.0177
	PCB 142	0.2540	U	6.51	6.00	4.03	0.0000	6.86	0.0000	10.67	0.0000
	PCB 143	0.2430	U	6.60	5.98	4.01	0.0000	6.95	0.0000	10.76	0.0000
	PCB 144	0.6800	J	6.67	5.90	3.93	0.0808	7.02	0.0021	5.50	0.0060
	PCB 145	0.0170	U	6.25	5.76	3.79	0.0000	6.60	0.0000	10.40	0.0000
	PCB 146	6.3400		6.89	6.04	4.07	0.5455	7.25	0.0180	5.55	0.0245
	PCBs 147 + 149	47.7000		6.66	5.93	3.96	5.2870	7.01	0.7003	4.83	1.2692
	PCB 148	0.8760		6.73	5.79	3.82	0.1340	7.08	0.0022	5.59	0.0047
	PCB 150	2.4600		6.32	5.69	3.72	0.4738	6.67	0.0246	5.00	0.0203
	PCB 151	11.3000		6.64	5.88	3.91	1.4053	6.99	0.0999	5.05	0.1724
	PCB 152	1.7200		6.22	5.73	3.76	0.3021	6.57	0.0000	10.37	0.0000
	PCBs 153 + 168	26.1000		7.02	6.07	4.10	2.0957	7.37	0.0631	5.62	0.0378
	PCB 155	0.8900	J	6.41	5.59	3.62	0.2158	6.76	0.0027	5.52	0.0007
	PCBs 156 + 157	0.9370		7.18	6.11	4.14	0.0686	7.54	0.0005	6.26	0.0009
	PCB 158	1.2600		7.02	6.20	4.23	0.0750	7.38	0.0011	6.05	0.0014
	PCB 159	0.4430		7.24	5.98	4.01	0.0438	7.60	0.0002	6.46	0.0003
	PCB 160	0.1030	U	6.93	6.19	4.22	0.0000	7.29	0.0000	11.09	0.0000
	PCB 161	0.1750	U	7.08	6.04	4.07	0.0000	7.44	0.0000	11.24	0.0000

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 162	0.0655	U	7.24	6.00	4.03	0.0000	7.60	0.0000	11.41	0.0000
	PCB 164	1.4500		7.02	6.19	4.22	0.0883	7.38	0.0009	6.23	0.0003
	PCB 165	0.5520	J	7.05	6.02	4.05	0.0497	7.41	0.0000	11.21	0.0000
	PCB 166	0.1830	U	6.93	6.25	4.28	0.0000	7.29	0.0000	11.09	0.0000
	PCB 167	0.4400		7.27	6.02	4.05	0.0396	7.63	0.0001	6.59	0.0001
	PCB 169	0.4280	J	7.42	6.23	4.26	0.0238	7.79	0.0000	11.59	0.0000
	PCB 170	14.0000		7.27	6.66	4.69	0.2889	7.63	0.0162	5.94	0.0254
	PCBs 171 + 173	5.0500		7.07	6.44	4.47	0.1730	7.42	0.0062	5.91	0.0060
	PCB 172	3.0100		7.33	6.50	4.53	0.0898	7.69	0.0016	6.27	0.0029
	PCB 174	16.1000		7.11	6.39	4.42	0.6188	7.47	0.0206	5.89	0.0096
	PCB 175	0.4630		7.17	6.27	4.30	0.0235	7.53	0.0001	6.49	0.0001
	PCB 176	2.0300		6.76	6.16	4.19	0.1325	7.12	0.0031	5.81	0.0011
	PCB 177	10.2000		7.08	6.41	4.44	0.3744	7.44	0.0146	5.84	0.0112
	PCB 178	4.9200		7.14	6.24	4.27	0.2671	7.50	0.0046	6.03	0.0040
	PCB 179	10.3000		6.73	6.12	4.15	0.7371	7.08	0.0334	5.49	0.0113
	PCBs 180 + 193	34.2000		7.44	6.54	4.56	0.9413	7.81	0.0503	5.83	0.2116
	PCB 181	0.1630	J	7.11	6.39	4.42	0.0063	7.47	0.0000	11.27	0.0000
	PCB 182	0.0312	U	7.20	6.28	4.31	0.0000	7.56	0.0000	11.37	0.0000
	PCB 183	12.8000		7.20	6.30	4.33	0.6052	7.56	0.0086	6.17	0.0021
	PCB 184	0.0377	J	6.85	6.06	4.09	0.0031	7.21	0.0000	11.01	0.0000
	PCB 185	2.0200		7.11	6.35	4.38	0.0851	7.47	0.0009	6.36	0.0003
	PCB 186	0.0225	U	6.69	6.20	4.23	0.0000	7.04	0.0000	10.85	0.0000
	PCB 187	19.8000		7.17	6.28	4.31	0.9803	7.53	0.0204	5.99	0.0071
	PCB 188	1.6300		6.82	6.02	4.05	0.1469	7.18	0.0013	6.09	0.0002
	PCB 189	0.3670		7.71	6.37	4.40	0.0148	8.08	0.0000	7.27	0.0000
	PCB 190	3.2200		7.46	6.66	4.69	0.0665	7.83	0.0008	6.62	0.0005
	PCB 191	0.6300		7.55	6.56	4.59	0.0164	7.92	0.0001	6.87	0.0002
	PCB 192	0.0742	U	7.52	6.49	4.52	0.0000	7.89	0.0000	11.69	0.0000
	PCB 194	9.3000		7.80	6.96	4.99	0.0962	8.17	0.0022	6.63	0.0070
	PCB 195	3.7700		7.56	6.86	4.89	0.0491	7.93	0.0011	6.55	0.0019
	PCB 196	5.4200		7.65	6.73	4.76	0.0952	8.02	0.0014	6.58	0.0033
	PCB 197	0.5040		7.30	6.50	4.53	0.0150	7.66	0.0001	6.66	0.0001
	PCBs 198 + 199	9.2400		7.41	6.63	4.66	0.2043	7.78	0.0054	6.24	0.0069
	PCB 200	1.2300		7.27	6.47	4.50	0.0393	7.63	0.0004	6.46	0.0004

PW504 (Field Duplicate) Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%					
f_{OC}=	0.90%	RI Calc Total PCB Congeners	1170	µg/kg	6.14	5.68
f_{BC}=	0.16%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
228.46	ng/L	829.17	ng/L
		Congener OC+BC Porewater Calc.	
		243.21	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 201	1.5200		7.62	6.71	4.74	0.0280	7.99	0.0003	6.78	0.0005
	PCB 202	2.5500		7.24	6.43	4.46	0.0894	7.60	0.0013	6.30	0.0011
	PCB 203	5.5600		7.65	6.73	4.76	0.0977	8.02	0.0015	6.57	0.0034
	PCB 204	0.0273	U	7.30	6.48	4.51	0.0000	7.66	0.0000	11.47	0.0000
	PCB 205	0.4730		8.00	6.99	5.02	0.0046	8.37	0.0000	7.38	0.0001
	PCB 206	2.6700		8.09	7.13	5.16	0.0187	8.47	0.0002	7.15	0.0012
	PCB 207	0.3640		7.74	6.90	4.93	0.0043	8.11	0.0000	7.16	0.0001
	PCB 208	0.4740		7.71	6.86	4.89	0.0062	8.08	0.0000	11.88	0.0000
	PCB 209	0.1290	J	8.18	7.27	5.30	0.0007	8.56	0.0000	12.36	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
f_{OC}=	0.86%	RI Calc Total PCB Congeners	157	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
34.06	ng/L	50.27	ng/L
		Congener OC+BC Porewater Calc.	
		8.50	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.0439	U	4.46	4.40	2.38	0.0000	4.78	0.0000	8.33	0.0000
	PCB 2	0.0339	U	4.69	4.51	2.49	0.0000	5.01	0.0000	8.57	0.0000
	PCB 3	0.0932	0	4.69	4.52	2.50	0.2950	5.01	0.0000	8.57	0.0000
	PCB 4	0.4580	U	4.65	4.40	2.38	0.0000	4.97	0.0000	8.53	0.0000
	PCB 5	0.1300	U	4.97	4.72	2.70	0.0000	5.30	0.0000	8.85	0.0000
	PCB 6	0.1300	U	5.06	4.71	2.69	0.0000	5.39	0.0000	8.94	0.0000
	PCB 7	0.1200	U	5.07	4.67	2.65	0.0000	5.40	0.0000	8.95	0.0000
	PCB 8	0.2980	0	5.07	4.72	2.70	0.5952	5.40	0.0000	8.95	0.0000
	PCB 9	0.1320	U	5.06	4.67	2.65	0.0000	5.39	0.0000	8.94	0.0000
	PCB 10	0.2080	U	4.84	4.40	2.38	0.0000	5.16	0.0000	8.72	0.0000
	PCB 11	0.1370	U	5.28	4.84	2.82	0.0000	5.61	0.0000	9.17	0.0000
	PCBs 12 + 13	0.1320	U	5.26	4.86	2.84	0.0000	5.59	0.0000	9.14	0.0000
	PCB 14	0.1330	U	5.28	4.77	2.75	0.0000	5.61	0.0000	9.17	0.0000
	PCB 15	0.2230	0	5.30	4.88	2.86	0.3081	5.63	0.0000	9.19	0.0000
	PCB 16	0.2260	0	5.16	4.88	2.86	0.3123	5.49	0.0000	9.04	0.0000
	PCB 17	0.3600	J	5.25	4.80	2.78	0.5981	5.58	0.1330	3.43	0.2161
	PCB 18	0.0382	U	5.24	4.79	2.77	0.0000	5.57	0.0000	9.12	0.0000
	PCB 19	0.2550	0	5.02	4.67	2.65	0.5715	5.35	0.0961	3.42	0.0315
	PCBs 20 + 28	3.1700	0	5.62	5.07	3.04	2.8610	5.96	0.6936	3.66	0.7286
	PCBs 21 + 33	1.2100	0	5.56	5.08	3.05	1.0672	5.89	0.2561	3.67	0.3894
	PCB 22	0.4340	0	5.58	5.11	3.09	0.3531	5.92	0.0000	9.47	0.0000
	PCB 23	0.0281	U	5.57	4.98	2.96	0.0000	5.91	0.0000	9.46	0.0000
	PCB 24	0.0358	U	5.35	4.84	2.82	0.0000	5.68	0.0000	9.24	0.0000
	PCB 25	0.1580	J	5.67	5.02	3.00	0.1582	6.01	0.0128	4.09	0.0222
	PCBs 26 + 29	0.4620	0	5.63	5.01	2.98	0.4787	5.97	0.0436	4.03	0.0278
	PCB 27	0.0785	J	5.44	4.79	2.77	0.1335	5.77	0.0055	4.16	0.0020
	PCB 30	0.7920	0	5.44	4.72	2.70	1.5819	5.77	0.1437	3.74	0.0559
	PCB 31	1.3800	0	5.67	5.04	3.02	1.3193	6.01	0.1861	3.87	0.1480
	PCB 32	0.3870	0	5.44	4.88	2.86	0.5348	5.77	0.0498	3.89	0.0179
	PCB 34	0.0324	U	5.66	4.98	2.96	0.0000	6.00	0.0000	9.55	0.0000
	PCB 35	0.0317	U	5.82	5.23	3.21	0.0000	6.16	0.0000	9.71	0.0000
	PCB 36	0.0293	U	5.88	5.15	3.13	0.0000	6.22	0.0000	9.78	0.0000
	PCB 37	0.3710	0	5.83	5.26	3.24	0.2137	6.17	0.0000	9.72	0.0000
	PCB 38	0.0326	U	5.76	5.19	3.17	0.0000	6.10	0.0000	9.65	0.0000
	PCB 39	0.0277	U	5.89	5.16	3.14	0.0000	6.23	0.0000	9.79	0.0000
	PCBs 40 + 71	1.3500	0	5.82	5.37	3.35	0.6037	6.16	0.4580	3.47	0.7864

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
f_{OC}=	0.86%	RI Calc Total PCB Congeners	157	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
34.06	ng/L	50.27	ng/L
		Congener OC+BC Porewater Calc.	
		8.50	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 41	0.2630	J	5.69	5.35	3.33	0.1231	6.03	0.0000	9.58	0.0000
	PCB 42	0.4550	0	5.76	5.31	3.29	0.2336	6.10	0.0296	4.19	0.0249
	PCBs 43 + 73	0.0346	U	5.90	5.21	3.18	0.0000	6.24	0.0000	9.79	0.0000
	PCBs 44 + 47 + 65	5.4500	0	5.82	5.26	3.24	3.1636	6.16	0.7557	3.86	0.7474
	PCBs 45 + 51	2.1300	0	5.58	5.11	3.08	1.7532	5.92	0.5346	3.60	1.0834
	PCB 46	0.2050	J	5.53	5.16	3.14	0.1487	5.87	0.0132	4.19	0.0035
	PCB 48	0.3160	J	5.78	5.23	3.21	0.1950	6.12	0.0000	9.67	0.0000
	PCB 49	6.9400	0	5.85	5.22	3.20	4.3834	6.19	0.7934	3.94	0.4000
	PCBs 50 + 53	2.6200	0	5.63	5.04	3.02	2.5047	5.96	0.3532	3.87	0.1040
	PCB 52	9.7800	0	5.84	5.20	3.18	6.4683	6.18	1.4882	3.82	1.1515
	PCB 54	0.2490	0	5.21	4.94	2.92	0.2997	5.54	0.0379	3.82	0.0058
	PCB 55	0.0441	U	6.11	5.44	3.42	0.0000	6.45	0.0000	10.01	0.0000
	PCB 56	1.1200	0	6.11	5.47	3.45	0.3978	6.45	0.0359	4.49	0.0320
	PCB 57	0.0326	U	6.17	5.34	3.32	0.0000	6.52	0.0000	10.07	0.0000
	PCB 58	0.0312	U	6.17	5.34	3.32	0.0000	6.52	0.0000	10.07	0.0000
	PCBs 59 + 62 + 75	0.3210	0	5.96	5.26	3.24	0.1835	6.31	0.0087	4.57	0.0051
	PCB 60	0.2020	J	6.11	5.47	3.45	0.0717	6.45	0.0000	10.01	0.0000
	PCB 61	0.0338	U	6.04	5.38	3.36	0.0000	6.38	0.0000	9.94	0.0000
	PCB 63	0.1010	0	6.17	5.37	3.35	0.0452	6.52	0.0000	10.07	0.0000
	PCB 64	0.6740	0	5.95	5.36	3.34	0.3084	6.29	0.0288	4.37	0.0242
	PCB 66	3.1300	0	6.20	5.41	3.39	1.2764	6.55	0.1206	4.41	0.1210
	PCB 67	0.0628	0	6.20	5.35	3.33	0.0294	6.55	0.0000	10.10	0.0000
	PCB 68	0.0918	J	6.26	5.31	3.29	0.0471	6.61	0.0006	5.16	0.0005
	PCB 69	0.0239	U	6.04	5.19	3.17	0.0000	6.38	0.0000	9.94	0.0000
	PCBs 70 + 74 + 76	3.6500	0	6.18	5.40	3.38	1.5349	6.52	0.1298	4.45	0.0748
	PCB 72	0.0743	J	6.26	5.29	3.27	0.0399	6.61	0.0000	10.16	0.0000
	PCB 77	0.1670	0	6.13	5.40	3.38	0.0697	6.47	0.0023	4.86	0.0019
	PCB 78	0.0274	U	4.97	4.72	2.70	0.0000	5.30	0.0000	8.85	0.0000
	PCB 79	0.0584	J	6.42	5.53	3.51	0.0181	6.77	0.0000	10.32	0.0000
	PCB 80	0.0226	U	6.48	5.42	3.40	0.0000	6.83	0.0000	10.38	0.0000
	PCB 81	0.0312	U	6.36	5.59	3.57	0.0000	6.71	0.0000	10.26	0.0000
	PCB 82	0.2970	J	6.20	5.86	3.84	0.0430	6.55	0.0000	10.10	0.0000
	PCBs 83 + 99	4.5800	0	6.31	5.68	3.65	1.0147	6.66	0.1631	4.45	0.2758

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
f_{OC}=	0.86%	RI Calc Total PCB Congeners	157	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
34.06	ng/L	50.27	ng/L
		Congener OC+BC Porewater Calc.	
		8.50	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 84	0.8500	0	6.04	5.61	3.59	0.2187	6.38	0.0251	4.53	0.0152
	PCB 85	0.7930	0	6.30	5.78	3.76	0.1380	6.65	0.0143	4.75	0.0215
	PCBs 86 + 87 + 97 + 109 + 119 + 125	3.0600	0	6.37	5.69	3.67	0.6524	6.72	0.0669	4.66	0.0710
	PCB 88	0.0371	U	6.07	5.53	3.51	0.0000	6.41	0.0000	9.97	0.0000
	PCB 89	0.0415	U	6.07	5.63	3.61	0.0000	6.41	0.0000	9.97	0.0000
	PCBs 90 + 101 + 113	8.1000	0	6.43	5.65	3.63	1.9154	6.78	0.2233	4.56	0.2504
	PCB 91	2.2600	0	6.13	5.55	3.53	0.6677	6.47	0.1213	4.27	0.2860
	PCB 92	2.1500	0	6.35	5.61	3.59	0.5532	6.70	0.0519	4.62	0.0820
	PCB 93	0.0373	U	6.04	5.51	3.49	0.0000	6.38	0.0000	9.94	0.0000
	PCB 94	0.0974	J	6.13	5.47	3.45	0.0346	6.47	0.0011	4.96	0.0008
	PCBs 95 + 100	6.4100	0	6.18	5.48	3.45	2.2507	6.53	0.3243	4.30	0.3039
	PCB 96	0.2730	0	5.71	5.38		0.1193		0.1317	3.32	0.1697
	PCBs 98 + 102	0.2280	J	6.15	5.51	3.48	0.0747	6.49	0.0023	5.00	0.0007
	PCB 103	0.8340	0	6.22	5.41	3.39	0.3401	6.57	0.0116	4.86	0.0039
	PCB 104	0.1040	0	5.81	5.27	3.25	0.0585	6.15	0.0015	4.84	0.0002
	PCB 105	1.0500	0	6.65	5.83	3.81	0.1628	7.00	0.0071	5.17	0.0104
	PCB 106	0.0583	U	6.64	5.73	3.71	0.0000	6.99	0.0000	10.55	0.0000
	PCB 107	0.5390	0	6.71	5.72	3.70	0.1077	7.06	0.0025	5.33	0.0046
	PCBs 108 + 124	0.0548	U	6.72	5.72	3.69	0.0000	7.07	0.0000	10.63	0.0000
	PCBs 110 + 115	4.3600	0	6.49	5.79	3.76	0.7498	6.84	0.0647	4.83	0.0452
	PCB 111	0.0266	U	6.76	5.60	3.58	0.0000	7.12	0.0000	10.67	0.0000
	PCB 112	0.0281	U	6.45	5.70	3.68	0.0000	6.80	0.0000	10.35	0.0000
	PCB 114	0.0493	U	6.65	5.77	3.75	0.0000	7.00	0.0000	10.56	0.0000
	PCBs 117 + 116	0.1220	J	6.40	5.76	3.73	0.0225	6.74	0.0004	5.47	0.0001
	PCB 118	3.4900	0	6.74	5.73	3.71	0.6812	7.09	0.0205	5.23	0.0126
	PCB 120	0.0266	U	6.79	5.62	3.60	0.0000	7.15	0.0000	10.70	0.0000
	PCB 121	0.0674	0	6.64	5.54	3.52	0.0204	6.99	0.0001	5.76	0.0001
	PCB 122	0.0651	U	6.64	5.78	3.76	0.0000	6.99	0.0000	10.55	0.0000
	PCB 123	0.0632	U	6.74	5.73	3.71	0.0000	7.09	0.0000	10.65	0.0000
	PCB 126	0.1430	J	6.89	5.95	3.93	0.0168	7.25	0.0002	5.97	0.0001

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
f_{OC}=	0.86%	RI Calc Total PCB Congeners	157	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
34.06	ng/L	50.27	ng/L
		Congener OC+BC Porewater Calc.	
		8.50	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 127	0.0589	U	6.95	5.83	3.81	0.0000	7.31	0.0000	4.25	0.0000
	PCB 128	0.6470	0	6.74	6.32	4.30	0.0325	7.09	0.0024	5.43	0.0031
	PCBs 129 + 138 + 163	6.8900	0	6.85	6.20	4.18	0.4522	7.21	0.0701	4.99	0.2791
	PCB 130	0.4280	0	6.80	6.15	4.13	0.0318	7.16	0.0010	5.63	0.0009
	PCB 131	0.0397	U	6.58	6.00	3.98	0.0000	6.93	0.0000	10.49	0.0000
	PCB 132	2.3500	0	6.58	6.06	4.04	0.2145	6.93	0.0207	5.05	0.0174
	PCB 133	0.5210	0	6.86	6.01	3.99	0.0534	7.22	0.0014	5.58	0.0021
	PCB 134	0.3130	0	6.55	5.98	3.96	0.0344	6.90	0.0012	5.43	0.0006
	PCBs 135 + 154	1.6500	0	6.70	5.87	3.84	0.2360	7.05	0.0115	5.16	0.0170
	PCB 136	1.6200	0	6.22	5.79	3.77	0.2754	6.57	0.0283	4.76	0.0104
	PCB 137	0.1250	J	6.83	6.17	4.15	0.0089	7.19	0.0003	5.64	0.0011
	PCBs 139 + 140	0.2620	0	6.67	5.95	3.93	0.0308	7.02	0.0000	10.58	0.0000
	PCB 141	0.9430	0	6.82	6.12	4.10	0.0750	7.18	0.0035	5.43	0.0053
	PCB 142	0.0473	U	6.51	6.00	3.98	0.0000	6.86	0.0000	10.42	0.0000
	PCB 143	0.0452	U	6.60	5.98	3.96	0.0000	6.95	0.0000	10.51	0.0000
	PCB 144	0.1530	J	6.67	5.90	3.88	0.0202	7.02	0.0006	5.43	0.0016
	PCB 145	0.0345	U	6.25	5.76	3.74	0.0000	6.60	0.0000	10.15	0.0000
	PCB 146	2.9500	0	6.89	6.04	4.02	0.2820	7.25	0.0134	5.34	0.0183
	PCBs 147 + 149	9.1600	0	6.66	5.93	3.91	1.1281	7.01	0.1492	4.79	0.2707
	PCB 148	0.1130	0	6.73	5.79	3.77	0.0192	7.08	0.0003	5.62	0.0006
	PCB 150	0.2210	J	6.32	5.69	3.67	0.0473	6.67	0.0018	5.09	0.0015
	PCB 151	2.3700	0	6.64	5.88	3.86	0.3275	6.99	0.0242	4.99	0.0418
	PCB 152	0.0382	U	6.22	5.73	3.71	0.0000	6.57	0.0000	10.12	0.0000
	PCBs 153 + 168	7.7000	0	7.02	6.07	4.05	0.6870	7.37	0.0249	5.49	0.0149
	PCB 155	0.0598	U	6.41	5.59	3.57	0.0000	6.76	0.0000	#DIV/0!	0.0000
	PCBs 156 + 157	0.5330	0	7.18	6.11	4.09	0.0434	7.54	0.0005	6.01	0.0009
	PCB 158	0.3940	0	7.02	6.20	4.18	0.0261	7.38	0.0005	5.91	0.0006
	PCB 159	0.0766	J	7.24	5.98	3.96	0.0084	7.60	0.0000	6.43	0.0001
	PCB 160	0.0191	U	6.93	6.19	4.17	0.0000	7.29	0.0000	10.84	0.0000
	PCB 161	0.0327	U	7.08	6.04	4.02	0.0000	7.44	0.0000	10.99	0.0000

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
f_{OC}=	0.86%	RI Calc Total PCB Congeners	157	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
34.06	ng/L	50.27	ng/L
		Congener OC+BC Porewater Calc.	
		8.50	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 162	0.0275	U	7.24	6.00	3.98	0.0000	7.60	0.0000	11.16	0.0000
	PCB 164	0.4760	0	7.02	6.19	4.17	0.0322	7.38	0.0004	6.08	0.0002
	PCB 165	0.0486	J	7.05	6.02	4.00	0.0049	7.41	0.0000	10.96	0.0000
	PCB 166	0.0341	U	6.93	6.25	4.23	0.0000	7.29	0.0000	10.84	0.0000
	PCB 167	0.1790	0	7.27	6.02	4.00	0.0179	7.63	0.0001	6.40	0.0001
	PCB 169	0.0251	U	7.42	6.23	4.21	0.0000	7.79	0.0000	11.34	0.0000
	PCB 170	2.3200	0	7.27	6.66	4.64	0.0532	7.63	0.0028	5.92	0.0044
	PCBs 171 + 173	0.8010	0	7.07	6.44	4.42	0.0305	7.42	0.0010	5.89	0.0010
	PCB 172	0.4720	0	7.33	6.50	4.48	0.0156	7.69	0.0003	6.25	0.0005
	PCB 174	2.6000	0	7.11	6.39	4.37	0.1110	7.47	0.0035	5.87	0.0016
	PCB 175	0.0602	J	7.17	6.27	4.25	0.0034	7.53	0.0000	6.51	0.0000
	PCB 176	0.3530	0	6.76	6.16	4.14	0.0256	7.12	0.0006	5.78	0.0002
	PCB 177	2.4100	0	7.08	6.41	4.39	0.0983	7.44	0.0042	5.76	0.0032
	PCB 178	0.7950	0	7.14	6.24	4.22	0.0480	7.50	0.0008	6.01	0.0007
	PCB 179	1.3900	0	6.73	6.12	4.10	0.1105	7.08	0.0044	5.50	0.0015
	PCBs 180 + 193	4.8400	0	7.44	6.54	4.51	0.1480	7.81	0.0070	5.84	0.0296
	PCB 181	0.0834	U	7.11	6.39	4.37	0.0000	7.47	0.0000	11.02	0.0000
	PCB 182	0.0484	U	7.20	6.28	4.26	0.0000	7.56	0.0000	11.12	0.0000
	PCB 183	1.5700	0	7.20	6.30	4.28	0.0825	7.56	0.0010	6.21	0.0002
	PCB 184	0.0316	U	6.85	6.06	4.04	0.0000	7.21	0.0000	10.76	0.0000
	PCB 185	0.2790	J	7.11	6.35	4.33	0.0131	7.47	0.0001	6.37	0.0000
	PCB 186	0.0350	U	6.69	6.20	4.18	0.0000	7.04	0.0000	10.60	0.0000
	PCB 187	3.6200	0	7.17	6.28	4.26	0.1991	7.53	0.0041	5.95	0.0014
	PCB 188	0.0481	U	6.82	6.02	4.00	0.0000	7.18	0.0000	10.73	0.0000
	PCB 189	0.0514	U	7.71	6.37	4.35	0.0000	8.08	0.0000	11.63	0.0000
	PCB 190	0.5090	0	7.46	6.66	4.64	0.0117	7.83	0.0001	6.60	0.0001
	PCB 191	0.0974	J	7.55	6.56	4.54	0.0028	7.92	0.0000	6.86	0.0000
	PCB 192	0.0733	U	7.52	6.49	4.47	0.0000	7.89	0.0000	11.44	0.0000
	PCB 194	1.1400	0	7.80	6.96	4.94	0.0131	8.17	0.0002	6.66	0.0008
	PCB 195	0.4430	0	7.56	6.86	4.84	0.0064	7.93	0.0001	6.59	0.0002
	PCB 196	0.6210	0	7.65	6.73	4.71	0.0121	8.02	0.0001	6.62	0.0003
	PCB 197	0.0539	J	7.30	6.50	4.48	0.0018	7.66	0.0000	6.72	0.0000
	PCBs 198 + 199	1.2300	0	7.41	6.63	4.61	0.0302	7.78	0.0007	6.25	0.0009
	PCB 200	0.1700	J	7.27	6.47	4.45	0.0060	7.63	0.0001	6.47	0.0001

PW005 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW005

f_{TOC}=	0.95%		Concentration		log Kow	log Koc
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Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
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Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 201	0.1630	0	7.62	6.71	4.69	0.0033	7.99	0.0000	6.84	0.0001
	PCB 202	0.2740	0	7.24	6.43	4.41	0.0107	7.60	0.0001	6.35	0.0001
	PCB 203	0.6690	0	7.65	6.73	4.71	0.0131	8.02	0.0002	6.61	0.0004
	PCB 204	0.0349	U	7.30	6.48	4.46	0.0000	7.66	0.0000	11.22	0.0000
	PCB 205	0.0532	0	8.00	6.99	4.97	0.0006	8.37	0.0000	7.43	0.0000
	PCB 206	0.4280	J	8.09	7.13	5.11	0.0033	8.47	0.0000	7.14	0.0002
	PCB 207	0.0511	U	7.74	6.90	4.88	0.0000	8.11	0.0000	11.66	0.0000
	PCB 208	0.1230	0	7.71	6.86	4.84	0.0018	8.08	0.0000	11.63	0.0000
	PCB 209	0.1820	0	8.18	7.27	5.25	0.0010	8.56	0.0000	12.11	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%		Concentration		log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
		0.00	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 1	0.0573	U	4.46	4.40	2.37	0.0000	4.78	0.0000	8.33	0.0000
	PCB 2	0.0380	U	4.69	4.51	2.48	0.0000	5.01	0.0000	8.57	0.0000
	PCB 3	0.0206	U	4.69	4.52	2.49	0.0000	5.01	0.0000	8.57	0.0000
	PCB 4	0.7520	U	4.65	4.40	2.37	0.0000	4.97	0.0000	8.53	0.0000
	PCB 5	0.1170	U	4.97	4.72	2.69	0.0000	5.30	0.0000	8.85	0.0000
	PCB 6	0.1170	U	5.06	4.71	2.68	0.0000	5.39	0.0000	8.94	0.0000
	PCB 7	0.1080	U	5.07	4.67	2.64	0.0000	5.40	0.0000	8.95	0.0000
	PCB 8	0.1110	U	5.07	4.72	2.69	0.0000	5.40	0.0000	8.95	0.0000
	PCB 9	0.1190	U	5.06	4.67	2.64	0.0000	5.39	0.0000	8.94	0.0000
	PCB 10	0.2900	U	4.84	4.40	2.37	0.0000	5.16	0.0000	8.72	0.0000
	PCB 11	0.2420		5.28	4.84	2.81	0.3786	5.61	0.0000	9.17	0.0000
	PCBs 12 + 13	0.1190	U	5.26	4.86	2.83	0.0000	5.59	0.0000	9.14	0.0000
	PCB 14	0.1200	U	5.28	4.77	2.74	0.0000	5.61	0.0000	9.17	0.0000
	PCB 15	0.0743	U	5.30	4.88	2.85	0.0000	5.63	0.0000	9.19	0.0000
	PCB 16	0.0455	U	5.16	4.88	2.85	0.0000	5.49	0.0000	9.04	0.0000
	PCB 17	0.0395	U	5.25	4.80	2.77	0.0000	5.58	0.0000	9.14	0.0000
	PCB 18	0.0283	U	5.24	4.79	2.76	0.0000	5.57	0.0000	9.12	0.0000
	PCB 19	0.0659	J	5.02	4.67	2.64	0.1525	5.35	0.0000	8.90	0.0000
	PCBs 20 + 28	0.0332	U	5.62	5.07	3.03	0.0000	5.96	0.0000	9.51	0.0000
	PCBs 21 + 33	0.0272	U	5.56	5.08	3.04	0.0000	5.89	0.0000	9.45	0.0000
	PCB 22	0.0186	U	5.58	5.11	3.08	0.0000	5.92	0.0000	9.47	0.0000
	PCB 23	0.0177	U	5.57	4.98	2.95	0.0000	5.91	0.0000	9.46	0.0000
	PCB 24	0.0266	U	5.35	4.84	2.81	0.0000	5.68	0.0000	9.24	0.0000
	PCB 25	0.0142	U	5.67	5.02	2.99	0.0000	6.01	0.0000	9.56	0.0000
	PCBs 26 + 29	0.0189	U	5.63	5.01	2.97	0.0000	5.97	0.0000	9.52	0.0000
	PCB 27	0.0297	U	5.44	4.79	2.76	0.0000	5.77	0.0000	9.33	0.0000
	PCB 30	0.0385	U	5.44	4.72	2.69	0.0000	5.77	0.0000	9.33	0.0000
	PCB 31	0.0174	U	5.67	5.04	3.01	0.0000	6.01	0.0000	9.56	0.0000
	PCB 32	0.0267	U	5.44	4.88	2.85	0.0000	5.77	0.0000	9.33	0.0000
	PCB 34	0.0204	U	5.66	4.98	2.95	0.0000	6.00	0.0000	9.55	0.0000
	PCB 35	0.0200	U	5.82	5.23	3.20	0.0000	6.16	0.0000	9.71	0.0000
	PCB 36	0.0185	U	5.88	5.15	3.12	0.0000	6.22	0.0000	9.78	0.0000
	PCB 37	0.0238	U	5.83	5.26	3.23	0.0000	6.17	0.0000	9.72	0.0000
	PCB 38	0.0205	U	5.76	5.19	3.16	0.0000	6.10	0.0000	9.65	0.0000
	PCB 39	0.0175	U	5.89	5.16	3.13	0.0000	6.23	0.0000	9.79	0.0000
	PCBs 40 + 71	0.0244	U	5.82	5.37	3.34	0.0000	6.16	0.0000	3.46	0.0000

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%		Concentration		log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
		0.00	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 41	0.0333	U	5.69	5.35	3.32	0.0000	6.03	0.0000	9.58	0.0000
	PCB 42	0.0233	U	5.76	5.31	3.28	0.0000	6.10	0.0000	9.65	0.0000
	PCBs 43 + 73	0.0232	U	5.90	5.21	3.17	0.0000	6.24	0.0000	9.79	0.0000
	PCBs 44 + 47 + 65	0.0671	U	5.82	5.26	3.22	0.0000	6.16	0.0000	9.71	0.0000
	PCBs 45 + 51	0.0315	J	5.58	5.11	3.07	0.0268	5.92	0.0000	9.47	0.0000
	PCB 46	0.0323	U	5.53	5.16	3.13	0.0000	5.87	0.0000	9.42	0.0000
	PCB 48	0.0256	U	5.78	5.23	3.20	0.0000	6.12	0.0000	9.67	0.0000
	PCB 49	0.0255	U	5.85	5.22	3.19	0.0000	6.19	0.0000	9.74	0.0000
	PCBs 50 + 53	0.0260	U	5.63	5.04	3.01	0.0000	5.96	0.0000	9.52	0.0000
	PCB 52	0.0324	U	5.84	5.20	3.17	0.0000	6.18	0.0000	9.73	0.0000
	PCB 54	0.0354	U	5.21	4.94	2.91	0.0000	5.54	0.0000	9.09	0.0000
	PCB 55	0.0295	U	6.11	5.44	3.41	0.0000	6.45	0.0000	10.01	0.0000
	PCB 56	0.0167	U	6.11	5.47	3.44	0.0000	6.45	0.0000	10.01	0.0000
	PCB 57	0.0219	U	6.17	5.34	3.31	0.0000	6.52	0.0000	10.07	0.0000
	PCB 58	0.0209	U	6.17	5.34	3.31	0.0000	6.52	0.0000	10.07	0.0000
	PCBs 59 + 62 + 75	0.0198	U	5.96	5.26	3.23	0.0000	6.31	0.0000	9.86	0.0000
	PCB 60	0.0161	U	6.11	5.47	3.44	0.0000	6.45	0.0000	10.01	0.0000
	PCB 61	0.0226	U	6.04	5.38	3.35	0.0000	6.38	0.0000	9.94	0.0000
	PCB 63	0.0216	U	6.17	5.37	3.34	0.0000	6.52	0.0000	10.07	0.0000
	PCB 64	0.0149	U	5.95	5.36	3.33	0.0000	6.29	0.0000	9.85	0.0000
	PCB 66	0.0272	U	6.20	5.41	3.38	0.0000	6.55	0.0000	10.10	0.0000
	PCB 67	0.0191	U	6.20	5.35	3.32	0.0000	6.55	0.0000	10.10	0.0000
	PCB 68	0.0186	U	6.26	5.31	3.28	0.0000	6.61	0.0000	10.16	0.0000
	PCB 69	0.0160	U	6.04	5.19	3.16	0.0000	6.38	0.0000	9.94	0.0000
	PCBs 70 + 74 + 76	0.0183	U	6.18	5.40	3.36	0.0000	6.52	0.0000	10.08	0.0000
	PCB 72	0.0199	U	6.26	5.29	3.26	0.0000	6.61	0.0000	10.16	0.0000
	PCB 77	0.0150	U	6.13	5.40	3.37	0.0000	6.47	0.0000	10.03	0.0000
	PCB 78	0.0172	U	4.97	4.72	2.69	0.0000	5.30	0.0000	8.85	0.0000
	PCB 79	0.0152	U	6.42	5.53	3.50	0.0000	6.77	0.0000	10.32	0.0000
	PCB 80	0.0142	U	6.48	5.42	3.39	0.0000	6.83	0.0000	10.38	0.0000
	PCB 81	0.0175	U	6.36	5.59	3.56	0.0000	6.71	0.0000	10.26	0.0000
	PCB 82	0.0439	U	6.20	5.86	3.83	0.0000	6.55	0.0000	10.10	0.0000
	PCBs 83 + 99	0.0337	U	6.31	5.68	3.64	0.0000	6.66	0.0000	10.21	0.0000

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%		Concentration		log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
		0.00	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 84	0.0331	U	6.04	5.61	3.58	0.0000	6.38	0.0000	9.94	0.0000
	PCB 85	0.0369	U	6.30	5.78	3.75	0.0000	6.65	0.0000	10.20	0.0000
	PCBs 86 + 87 + 97 + 109 + 119 + 125	0.0284	U	6.37	5.69	3.66	0.0000	6.72	0.0000	10.27	0.0000
	PCB 88	0.0305	U	6.07	5.53	3.50	0.0000	6.41	0.0000	9.97	0.0000
	PCB 89	0.0374	U	6.07	5.63	3.60	0.0000	6.41	0.0000	9.97	0.0000
	PCBs 90 + 101 + 113	0.0300	U	6.43	5.65	3.61	0.0000	6.78	0.0000	10.33	0.0000
	PCB 91	0.0261	U	6.13	5.55	3.52	0.0000	6.47	0.0000	10.03	0.0000
	PCB 92	0.0351	U	6.35	5.61	3.58	0.0000	6.70	0.0000	10.25	0.0000
	PCB 93	0.0307	U	6.04	5.51	3.48	0.0000	6.38	0.0000	9.94	0.0000
	PCB 94	0.0285	U	6.13	5.47	3.44	0.0000	6.47	0.0000	10.03	0.0000
	PCBs 95 + 100	0.0259	U	6.18	5.48	3.44	0.0000	6.53	0.0000	10.08	0.0000
	PCB 96	0.0215	U	5.71	5.38		0.0000		0.0000	3.75	0.0000
	PCBs 98 + 102	0.0244	U	6.15	5.51	3.47	0.0000	6.49	0.0000	10.04	0.0000
	PCB 103	0.0262	U	6.22	5.41	3.38	0.0000	6.57	0.0000	10.12	0.0000
	PCB 104	0.0355	U	5.81	5.27	3.24	0.0000	6.15	0.0000	9.70	0.0000
	PCB 105	0.0175	U	6.65	5.83	3.80	0.0000	7.00	0.0000	10.56	0.0000
	PCB 106	0.0189	U	6.64	5.73	3.70	0.0000	6.99	0.0000	10.55	0.0000
	PCB 107	0.0197	U	6.71	5.72	3.69	0.0000	7.06	0.0000	10.62	0.0000
	PCBs 108 + 124	0.0178	U	6.72	5.72	3.68	0.0000	7.07	0.0000	10.63	0.0000
	PCBs 110 + 115	0.0215	U	6.49	5.79	3.75	0.0000	6.84	0.0000	10.39	0.0000
	PCB 111	0.0240	U	6.76	5.60	3.57	0.0000	7.12	0.0000	10.67	0.0000
	PCB 112	0.0254	U	6.45	5.70	3.67	0.0000	6.80	0.0000	10.35	0.0000
	PCB 114	0.0162	U	6.65	5.77	3.74	0.0000	7.00	0.0000	10.56	0.0000
	PCBs 117 + 116	0.0251	U	6.40	5.76	3.72	0.0000	6.74	0.0000	10.30	0.0000
	PCB 118	0.0156	U	6.74	5.73	3.70	0.0000	7.09	0.0000	10.65	0.0000
	PCB 120	0.0240	U	6.79	5.62	3.59	0.0000	7.15	0.0000	10.70	0.0000
	PCB 121	0.0234	U	6.64	5.54	3.51	0.0000	6.99	0.0000	10.55	0.0000
	PCB 122	0.0211	U	6.64	5.78	3.75	0.0000	6.99	0.0000	10.55	0.0000
	PCB 123	0.0211	U	6.74	5.73	3.70	0.0000	7.09	0.0000	10.65	0.0000
	PCB 126	0.0175	U	6.89	5.95	3.92	0.0000	7.25	0.0000	10.80	0.0000

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%			Concentration	log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%			From Table 5-1	Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
		0.00	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 127	0.0191	U	6.95	5.83	3.80	0.0000	7.31	0.0000	4.24	0.0000
	PCB 128	0.0264	U	6.74	6.32	4.29	0.0000	7.09	0.0000	10.65	0.0000
	PCBs 129 + 138 + 163	0.0307	U	6.85	6.20	4.17	0.0000	7.21	0.0000	10.76	0.0000
	PCB 130	0.0336	U	6.80	6.15	4.12	0.0000	7.16	0.0000	10.71	0.0000
	PCB 131	0.0247	U	6.58	6.00	3.97	0.0000	6.93	0.0000	10.49	0.0000
	PCB 132	0.0292	U	6.58	6.06	4.03	0.0000	6.93	0.0000	10.49	0.0000
	PCB 133	0.0294	U	6.86	6.01	3.98	0.0000	7.22	0.0000	10.77	0.0000
	PCB 134	0.0250	U	6.55	5.98	3.95	0.0000	6.90	0.0000	10.46	0.0000
	PCBs 135 + 154	0.0232	U	6.70	5.87	3.83	0.0000	7.05	0.0000	10.61	0.0000
	PCB 136	0.0205	U	6.22	5.79	3.76	0.0000	6.57	0.0000	10.12	0.0000
	PCB 137	0.0256	U	6.83	6.17	4.14	0.0000	7.19	0.0000	10.74	0.0000
	PCBs 139 + 140	0.0253	U	6.67	5.95	3.92	0.0000	7.02	0.0000	10.58	0.0000
	PCB 141	0.0274	U	6.82	6.12	4.09	0.0000	7.18	0.0000	10.73	0.0000
	PCB 142	0.0295	U	6.51	6.00	3.97	0.0000	6.86	0.0000	10.42	0.0000
	PCB 143	0.0282	U	6.60	5.98	3.95	0.0000	6.95	0.0000	10.51	0.0000
	PCB 144	0.0254	U	6.67	5.90	3.87	0.0000	7.02	0.0000	10.58	0.0000
	PCB 145	0.0191	U	6.25	5.76	3.73	0.0000	6.60	0.0000	10.15	0.0000
	PCB 146	0.0264	U	6.89	6.04	4.01	0.0000	7.25	0.0000	10.80	0.0000
	PCBs 147 + 149	0.0250	U	6.66	5.93	3.90	0.0000	7.01	0.0000	10.56	0.0000
	PCB 148	0.0268	U	6.73	5.79	3.76	0.0000	7.08	0.0000	10.64	0.0000
	PCB 150	0.0174	U	6.32	5.69	3.66	0.0000	6.67	0.0000	10.22	0.0000
	PCB 151	0.0294	U	6.64	5.88	3.85	0.0000	6.99	0.0000	10.55	0.0000
	PCB 152	0.0212	U	6.22	5.73	3.70	0.0000	6.57	0.0000	10.12	0.0000
	PCBs 153 + 168	0.0212	U	7.02	6.07	4.04	0.0000	7.37	0.0000	10.93	0.0000
	PCB 155	0.0339	U	6.41	5.59	3.56	0.0000	6.76	0.0000	10.31	0.0000
	PCBs 156 + 157	0.0374	U	7.18	6.11	4.08	0.0000	7.54	0.0000	11.10	0.0000
	PCB 158	0.0190	U	7.02	6.20	4.17	0.0000	7.38	0.0000	10.93	0.0000
	PCB 159	0.0273	U	7.24	5.98	3.95	0.0000	7.60	0.0000	11.16	0.0000
	PCB 160	0.0119	U	6.93	6.19	4.16	0.0000	7.29	0.0000	10.84	0.0000
	PCB 161	0.0204	U	7.08	6.04	4.01	0.0000	7.44	0.0000	10.99	0.0000

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%		Concentration		log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%		From Table 5-1		Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
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Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 162	0.0247	U	7.24	6.00	3.97	0.0000	7.60	0.0000	11.16	0.0000
	PCB 164	0.0211	U	7.02	6.19	4.16	0.0000	7.38	0.0000	10.93	0.0000
	PCB 165	0.0210	U	7.05	6.02	3.99	0.0000	7.41	0.0000	10.96	0.0000
	PCB 166	0.0213	U	6.93	6.25	4.22	0.0000	7.29	0.0000	10.84	0.0000
	PCB 167	0.0198	U	7.27	6.02	3.99	0.0000	7.63	0.0000	11.19	0.0000
	PCB 169	0.0230	U	7.42	6.23	4.20	0.0000	7.79	0.0000	11.34	0.0000
	PCB 170	0.0570	U	7.27	6.66	4.63	0.0000	7.63	0.0000	11.19	0.0000
	PCBs 171 + 173	0.0551	U	7.07	6.44	4.41	0.0000	7.42	0.0000	10.98	0.0000
	PCB 172	0.0571	U	7.33	6.50	4.47	0.0000	7.69	0.0000	11.25	0.0000
	PCB 174	0.0500	U	7.11	6.39	4.36	0.0000	7.47	0.0000	11.02	0.0000
	PCB 175	0.0303	U	7.17	6.27	4.24	0.0000	7.53	0.0000	11.09	0.0000
	PCB 176	0.0231	U	6.76	6.16	4.13	0.0000	7.12	0.0000	10.67	0.0000
	PCB 177	0.0545	U	7.08	6.41	4.38	0.0000	7.44	0.0000	10.99	0.0000
	PCB 178	0.0303	U	7.14	6.24	4.21	0.0000	7.50	0.0000	11.06	0.0000
	PCB 179	0.0225	U	6.73	6.12	4.09	0.0000	7.08	0.0000	10.64	0.0000
	PCBs 180 + 193	0.0382	U	7.44	6.54	4.50	0.0000	7.81	0.0000	11.36	0.0000
	PCB 181	0.0454	U	7.11	6.39	4.36	0.0000	7.47	0.0000	11.02	0.0000
	PCB 182	0.0301	U	7.20	6.28	4.25	0.0000	7.56	0.0000	11.12	0.0000
	PCB 183	0.0494	U	7.20	6.30	4.27	0.0000	7.56	0.0000	11.12	0.0000
	PCB 184	0.0197	U	6.85	6.06	4.03	0.0000	7.21	0.0000	10.76	0.0000
	PCB 185	0.0458	U	7.11	6.35	4.32	0.0000	7.47	0.0000	11.02	0.0000
	PCB 186	0.0218	U	6.69	6.20	4.17	0.0000	7.04	0.0000	10.60	0.0000
	PCB 187	0.0270	U	7.17	6.28	4.25	0.0000	7.53	0.0000	11.09	0.0000
	PCB 188	0.0306	U	6.82	6.02	3.99	0.0000	7.18	0.0000	10.73	0.0000
	PCB 189	0.0273	U	7.71	6.37	4.34	0.0000	8.08	0.0000	11.63	0.0000
	PCB 190	0.0388	U	7.46	6.66	4.63	0.0000	7.83	0.0000	11.38	0.0000
	PCB 191	0.0415	U	7.55	6.56	4.53	0.0000	7.92	0.0000	11.47	0.0000
	PCB 192	0.0399	U	7.52	6.49	4.46	0.0000	7.89	0.0000	11.44	0.0000
	PCB 194	0.0420	U	7.80	6.96	4.93	0.0000	8.17	0.0000	11.73	0.0000
	PCB 195	0.0442	U	7.56	6.86	4.83	0.0000	7.93	0.0000	11.48	0.0000
	PCB 196	0.0419	U	7.65	6.73	4.70	0.0000	8.02	0.0000	11.57	0.0000
	PCB 197	0.0271	U	7.30	6.50	4.47	0.0000	7.66	0.0000	11.22	0.0000
	PCBs 198 + 199	0.0398	U	7.41	6.63	4.60	0.0000	7.78	0.0000	11.33	0.0000
	PCB 200	0.0301	U	7.27	6.47	4.44	0.0000	7.63	0.0000	11.19	0.0000

PW006 Modeled Estimates from Individual ALS-Measured Sediment Congener

Porewater Station PW006

f_{TOC}=	0.92%			Concentration	log Kow	log Koc
f_{OC}=	0.83%	RI Calc Total PCB Congeners	0.34	µg/kg	6.14	5.68
f_{BC}=	0.09%			From Table 5-1	Total PCB Kow LWG Bioaccumulation Model	LOG((10^Kow)*0.35)

Summary Results

Sum Total Sediment PCB Congeners OC Porewater Calc.		Congener OC Porewater Calc.	
0.08	ng/L	0.56	ng/L
		Congener OC+BC Porewater Calc.	
		0.00	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines	PCB Congener(s)	PCB Congener Concentration (µg/kg)	Data Qualifier	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
	PCB 201	0.0294	U	7.62	6.71	4.68	0.0000	7.99	0.0000	11.54	0.0000
	PCB 202	0.0314	U	7.24	6.43	4.40	0.0000	7.60	0.0000	11.16	0.0000
	PCB 203	0.0344	U	7.65	6.73	4.70	0.0000	8.02	0.0000	11.57	0.0000
	PCB 204	0.0296	U	7.30	6.48	4.45	0.0000	7.66	0.0000	11.22	0.0000
	PCB 205	0.0303	U	8.00	6.99	4.96	0.0000	8.37	0.0000	11.93	0.0000
	PCB 206	0.0457	U	8.09	7.13	5.10	0.0000	8.47	0.0000	12.02	0.0000
	PCB 207	0.0438	U	7.74	6.90	4.87	0.0000	8.11	0.0000	11.66	0.0000
	PCB 208	0.0499	U	7.71	6.86	4.83	0.0000	8.08	0.0000	11.63	0.0000
	PCB 209	0.0318	U	8.18	7.27	5.24	0.0000	8.56	0.0000	12.11	0.0000

Notes:

Performance Reference Compounds

PRCs not included in porewater calculations

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

PW001 Modeled Estimates of Porewater Concentrations from ALS-Measured Aroclors

Porewater Station PW001

	Concentration		log Kow	log Koc
Aroclor 1242/1232	3.8	µg/kg	5.60	5.14
Aroclor 1248	3.5	µg/kg	6.30	5.84
Aroclor 1254	3.3	µg/kg	6.50	6.04
Aroclor 1260	82	µg/kg	6.80	6.34
RI Calc Total PCB Aroclors	82	µg/kg	6.14	5.68
FS Calc Total PCB Aroclors	101	µg/kg	6.14	5.68
Total RI Sum PCB Congeners	311	µg/kg	6.14	5.68
	From Table 5-1		Aroclor Kow from	LOG((10^Kow)*0.35)

Carbon

f_{TOC}=	0.39%
f_{OC}=	0.30%
f_{BC}=	0.09%

Calculation

PCB Congener	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model				
	A1232/ 1242	A1248	A1254	A1260	Sum	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)	Cw (ug/L)
Aroclor 1242/1232	3.8				3.8	5.60	5.14	2.73	7.0836	5.94	1.11540	3.53	1.11540	0.011154
Aroclor 1248		3.5			3.5	6.30	5.84	3.43	1.2832	6.65	0.10279	4.53	0.10279	0.0010279
Aroclor 1254			3.3		3.3	6.50	6.04	3.63	0.7744	6.85	0.05032	4.82	0.05032	0.0005032
Aroclor 1260				82.0	82.0	6.80	6.34	3.93	9.6446	7.16	1.60849	4.71	1.60849	0.0160849

Summary Estimates

FS Calc Total PCB Porewater	FS Calc Total PCB Porewater OC+ BC
18.79 ng/L	2.88 ng/L
RI Calc Total PCB Porewater	RI Calc Total PCB Porewater OC+BC
9.64 ng/L	1.61 ng/L

PW002 Modeled Porewater Estimates from ALS-Measured Aroclors
Porewater Station PW002

	Concentration		log Kow	log Koc
Aroclor 1242/1232	47.5	µg/kg	5.60	5.14
Aroclor 1248	31.0	µg/kg	6.30	5.84
Aroclor 1254	13.5	µg/kg	6.50	6.04
Aroclor 1260	170.0	µg/kg	6.80	6.34
FS Calc Total PCB Aroclors	324	µg/kg	6.14	5.68
Total RI Sum PCB Congners	479	µg/kg	6.14	5.68
	From Table 5-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)

Carbon

f_{TOC}=	2.51%
f_{OC}=	2.34%
f_{BC}=	0.17%

Calculations

PCB Congener	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
	A1232/ 1242	A1248	A1254	A1260	Sum	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
Aroclor 1242/1232	47.5000				47.5000	5.60	5.14	3.54	13.5816	5.94	7.33395	3.81	7.33395
Aroclor 1248		31.0000			31.0000	6.30	5.84	4.24	1.7686	6.65	0.60403	4.71	0.60403
Aroclor 1254			13.5000		13.5000	6.50	6.04	4.44	0.4860	6.85	0.11453	5.07	0.11453
Aroclor 1260				170.0000	170.0000	6.80	6.34	4.74	3.0670	7.16	1.18227	5.16	1.18227

Summary Estimates

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
18.90	ng/L	9.23	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
3.07	ng/L	1.18	ng/L

PW003 Modeled Estimates from ALS-Measured Aroclors

Porewater Station PW003

			Concentration		log Kow	log Koc
f_{TOC}=	2.63%	Aroclor 1242/1232	37.3	µg/kg	5.60	5.14
f_{OC}=	2.46%	Aroclor 1248	18.5	µg/kg	6.30	5.84
f_{BC}=	0.17%	Aroclor 1254	24.0	µg/kg	6.50	6.04
		Aroclor 1260	120.0	µg/kg	6.80	6.34
Note: Used the average fbc		FS Calc Total PCB Aroclors	256	µg/kg	6.14	5.68
for sites 1 - 2, and 4 - 6		Total RI Sum PCB Congners	796	µg/kg	6.14	5.68

From Table 5-1 Aroclor Kow from ATSDR LOG((10^Kow)*0.35)

Calculations

	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
PCB Congener	**A1232/ 1242**	**A1248**	**A1254**	**A1260**	**Sum**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
Aroclor 1242/123	37.250				37.2500	5.60	5.14	3.56	10.1649	5.94	5.34953	3.84	5.34953
Aroclor 1248		18.5000			18.5000	6.30	5.84	4.26	1.0073	6.65	0.30847	4.78	0.30847
Aroclor 1254			24.0000		24.0000	6.50	6.04	4.46	0.8245	6.85	0.23727	5.00	0.23727
Aroclor 1260				120.0000	120.0000	6.80	6.34	4.76	2.0661	7.16	0.75048	5.20	0.75048

Summary Estimates

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
14.06	ng/L	6.65	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
2.07	ng/L	0.75	ng/L

PW004 Modeled Estimates from ALS-Measured Aroclors

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	1.26%	Aroclor 1242/1232	150.0	µg/kg	5.60	5.14
f_{OC}=	1.18%	Aroclor 1248	190.0	µg/kg	6.30	5.84
f_{BC}=	0.08%	Aroclor 1254	60.0	µg/kg	6.50	6.04
		Aroclor 1260	1600.0	µg/kg	6.80	6.34
		FS Calc Total PCB Aroclors	2190	µg/kg	6.14	5.68
		Total RI Sum PCB Congners	1180	µg/kg	6.14	5.68
			From Table 5-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)

Calculations

PCB Aroclor	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
	A1232/1242	A1248	A1254	A1260	Sum	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
Aroclor 1242/1232	150.0000				150.0000	5.60	5.14	3.24	85.4383	5.94	61.36443	3.39	61.36443
Aroclor 1248		190.0000			190.0000	6.30	5.84	3.94	21.5931	6.65	12.81717	4.17	12.81717
Aroclor 1254			60.0000		60.0000	6.50	6.04	4.14	4.3024	6.85	1.89143	4.50	1.89143
Aroclor 1260				1600.0000	1600.0000	6.80	6.34	4.44	57.5018	7.16	38.76637	4.62	38.76637
									168.8356				114.839399

Summary Estimate

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
168.84	ng/L	114.84	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
57.50	ng/L	38.77	ng/L

PW504 (Field Replicate) Modeled Estimates from ALS-Measured Aroclors

Porewater Station PW504

			Concentration		log Kow	log Koc
f_{TOC}=	1.06%	Aroclor 1242/1232	38.0	µg/kg	5.60	5.14
f_{OC}=	0.98%	Aroclor 1248	140.0	µg/kg	6.30	5.84
f_{BC}=	0.09%	Aroclor 1254	22.0	µg/kg	6.50	6.04
		Aroclor 1260	920.0	µg/kg	6.80	6.34
		FS Calc Total PCB Aroclors	1180	µg/kg	6.14	5.68
		Total RI Sum PCB Congners	1170	µg/kg	6.14	5.68
			From Table 5-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)

Calculations

PCB Aroclor	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
	A1232/1242	A1248	A1254	A1260	Sum	logKow	logKoc (Lw/kg OC)	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
Aroclor 1242/1232	38.0000				38.0000	5.60	5.14	3.17	25.7282	5.94	14.19100	3.43	14.19100
Aroclor 1248		140.0000			140.0000	6.30	5.84	3.87	18.9127	6.65	9.71548	4.16	9.71548
Aroclor 1254			22.0000		22.0000	6.50	6.04	4.07	1.8752	6.85	0.55868	4.60	0.55868
Aroclor 1260				920.0000	920.0000	6.80	6.34	4.37	39.3019	7.16	22.71080	4.61	22.71080
									85.8181				47.1759609

Summary Estimates

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
85.82	ng/L	47.18	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
39.30	ng/L	22.71	ng/L

PW005 Modeled Estimates from ALS-Measured Aroclors

Porewater Station PW005

			Concentration		log Kow	log Koc
f_{TOC}=	0.95%	Aroclor 1242/1232	10.8	µg/kg	5.60	5.14
f_{OC}=	0.86%	Aroclor 1248	7.0	µg/kg	6.30	5.84
f_{BC}=	0.09%	Aroclor 1254	14.0	µg/kg	6.50	6.04
		Aroclor 1260	55.0	µg/kg	6.80	6.34
		FS Calc Total PCB Aroclors	109	µg/kg	6.14	5.68
		Total RI Sum PCB Congners	157	µg/kg	6.14	5.68
			From Table 5-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)

Calculations

PCB Aroclor	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
	A1232/1242	A1248	A1254	A1260	Sum	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
Aroclor 1242/1232	10.7500				10.7500	5.60	5.14	3.12	8.0871	5.94	3.16698	3.53	3.16698
Aroclor 1248		7.0000			7.0000	6.30	5.84	3.82	1.0507	6.65	0.22665	4.49	0.22665
Aroclor 1254			14.0000		14.0000	6.50	6.04	4.02	1.3259	6.85	0.30538	4.66	0.30538
Aroclor 1260				55.0000	55.0000	6.80	6.34	4.32	2.6106	7.16	0.72882	4.88	0.72882
									13.0743				4.42783148

Summary Estimates

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
13.07	ng/L	4.43	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
2.61	ng/L	0.73	ng/L

PW006 Modeled Estimates from ALS-Measured Aroclors

Porewater Station PW006

			Concentration		log Kow	log Koc
f_{TOC}=	0.92%	Aroclor 1242/1232	1.1	µg/kg	5.60	5.14
f_{OC}=	0.83%	Aroclor 1248	1.1	µg/kg	6.30	5.84
f_{BC}=	0.09%	Aroclor 1254	1.1	µg/kg	6.50	6.04
		Aroclor 1260	1.1	µg/kg	6.80	6.34
		FS Calc Total PCB Aroclors	2.1	µg/kg	6.14	5.68
		Total RI Sum PCB Congners	0	µg/kg	6.14	5.68
			From Table 5-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)

Calculations

PCB Aroclor	Aroclor Concentrations					Organic Carbon Model				Black Carbon Model			
	A1232/1242	A1248	A1254	A1260	Sum	logKow [1]	logKoc (Lw/kg OC)[2]	logKd (Lw/kg sed)	Cw (ng/L)	$logK_{BC}$ ($L^{0.7}$/kg BC)	Csed/Kd (ng/L)	logKd (L/kg sed)	Cw (ng/L)
Aroclor 1242/1232	1.0500				1.0500	5.60	5.14	3.11	0.8155	5.94	0.16118	3.81	0.16118
Aroclor 1248		1.0500			1.0500	6.30	5.84	3.81	0.1627	6.65	0.01774	4.77	0.01774
Aroclor 1254			1.0500		1.0500	6.50	6.04	4.01	0.1027	6.85	0.00933	5.05	0.00933
Aroclor 1260				1.0500	1.0500	6.80	6.34	4.31	0.0515	7.16	0.00353	5.47	0.00353
									1.1324				0.191778223

Summary Estimates

FS Calc Total PCB Porewater		FS Calc Total PCB Porewater OC+ BC	
1.13	ng/L	0.19	ng/L
RI Calc Total PCB Porewater		RI Calc Total PCB Porewater OC+BC	
0.05	ng/L	0.00	ng/L

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
1	PCB 1	ND	0.0000	4.46	4.40	2.00	4.4000	4.78	0.0000	0.00	0.0000
1	PCB 2	ND	0.0000	4.69	4.51	2.11	0.0000	5.01	0.0000	0.00	0.0000
1	PCB 3	ND	0.0000	4.69	4.52	2.12	0.0000	5.01	0.0000	0.00	0.0000
2	PCBs 4 + 10	0.70	0.7022	4.75	4.40	2.00	6.9892	5.07	3.7597	2.27	3.7597
2	PCBs 5 + 8	ND	0.0000	5.02	4.72	2.32	0.0000	5.35	0.0000	0.00	0.0000
2	PCB 6	ND	0.0000	5.06	4.71	2.31	0.0000	5.39	0.0000	0.00	0.0000
2	PCBs 7 + 9	ND	0.0000	5.07	4.67	2.27	0.0000	5.39	0.0000	0.00	0.0000
2	PCB 11	ND	0.0000	5.28	4.84	2.44	0.0000	5.61	0.0000	0.00	0.0000
2	PCB 12	ND	0.0000	5.22	4.86	2.46	0.0000	5.55	0.0000	0.00	0.0000
2	PCB 13	ND	0.0000	5.29	4.86	2.46	0.0000	5.62	0.0000	0.00	0.0000
2	PCB 14	1.10	1.1043	5.28	4.77	2.37	4.6885	5.61	1.7517	2.80	1.7517
2	PCB 15	ND	0.0000	5.30	4.88	2.48	0.0000	5.63	0.0000	0.00	0.0000
3	PCBs 16 + 32	0.71	0.7116	5.30	4.88	2.48	2.3453	5.63	0.8753	2.91	0.8753
3	PCB 17	0.64	0.6351	5.25	4.80	2.40	2.5163	5.58	0.9041	2.85	0.9041
3	PCB 18	ND	0.0000	5.24	4.79	2.39	0.0000	5.57	0.0000	0.00	0.0000
3	PCB 19	1.66	1.6570	5.02	4.67	2.27	8.8565	5.35	4.9030	2.53	4.9030
3	PCBs 20+21+33	0.98	0.9760	5.56	5.08	2.68	2.0451	5.90	0.6449	3.18	0.6449
3	PCB 22	ND	0.0000	5.51	5.07	2.67	0.0000	5.85	0.0000	0.00	0.0000
3	PCBs 23 + 34	ND	0.0000	5.62	4.98	2.58	0.0000	5.95	0.0000	0.00	0.0000
3	PCBs 24+27	0.41	0.4125	5.40	4.82	2.42	1.5789	5.73	0.3755	3.04	0.3755
3	PCBs 25+26	ND	0.0000	5.67	5.02	2.62	0.0000	6.00	0.0000	0.00	0.0000
3	PCBs 28+31	0.38	0.3832	5.67	5.05	2.65	0.8638	6.01	0.1498	3.41	0.1498
3	PCB 29	ND	0.0000	5.60	4.99	2.59	0.0000	5.94	0.0000	0.00	0.0000
3	PCB 30	ND	0.0000	5.44	4.72	2.32	0.0000	5.77	0.0000	0.00	0.0000
3	PCB 35	ND	0.0000	5.82	5.23	2.83	0.0000	6.16	0.0000	0.00	0.0000
3	PCB 36	1.84	1.8378	5.88	5.15	2.75	3.2526	6.22	0.6636	3.44	0.6636
3	PCB 37	ND	0.0000	5.83	5.26	2.86	0.0000	6.17	0.0000	0.00	0.0000
3	PCB 38	ND	0.0000	5.76	5.19	2.79	0.0000	6.10	0.0000	0.00	0.0000
3	PCB 39	ND	0.0000	5.89	5.16	2.76	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 40	ND	0.0000	5.66	5.39	2.99	0.0000	6.00	0.0000	0.00	0.0000

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
4	PCBs 41+64+68	ND	0.0000	5.97	5.34	2.94	0.0000	6.31	0.0000	0.00	0.0000
4	PCB 42	ND	0.0000	5.76	5.31	2.91	0.0000	6.10	0.0000	0.00	0.0000
4	PCB 43	ND	0.0000	5.75	5.21	2.81	0.0000	6.09	0.0000	0.00	0.0000
4	PCB 44	ND	0.0000	5.75	5.30	2.90	0.0000	6.09	0.0000	0.00	0.0000
4	PCB 45	ND	0.0000	5.53	5.12	2.72	0.0000	5.87	0.0000	0.00	0.0000
4	PCB 46	ND	0.0000	5.53	5.16	2.76	0.0000	5.87	0.0000	0.00	0.0000
4	PCBs 47+48+75	3.69	3.6942	5.89	5.23	2.83	5.4383	6.23	1.5156	3.39	1.5156
4	PCB 49	2.33	2.3258	5.85	5.22	2.82	3.5035	6.19	0.9272	3.40	0.9272
4	PCB 50	ND	0.0000	5.63	5.01	2.61	0.0000	5.97	0.0000	0.00	0.0000
4	PCB 52	2.89	2.8926	5.84	5.20	2.80	4.5627	6.18	1.2752	3.36	1.2752
4	PCB 54	0.49	0.4875	5.21	4.94	2.54	1.3993	5.54	0.6066	2.91	0.6066
4	PCB 55	ND	0.0000	6.11	5.44	3.04	0.0000	6.45	0.0000	0.00	0.0000
4	PCBs 56+60	ND	0.0000	6.11	5.47	3.07	0.0000	6.45	0.0000	0.00	0.0000
4	PCB 57	ND	0.0000	6.17	5.34	2.94	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 58	ND	0.0000	6.17	5.37	2.97	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 59	ND	0.0000	5.95	5.31	2.91	0.0000	6.29	0.0000	0.00	0.0000
4	PCB 61	ND	0.0000	6.04	5.38	2.98	0.0000	6.38	0.0000	0.00	0.0000
4	PCB 62	ND	0.0000	5.89	5.25	2.85	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 63	1.21	1.2107	6.17	5.37	2.97	1.2912	6.52	0.1576	3.89	0.1576
4	PCB 65	ND	0.0000	5.86	5.24	2.84	0.0000	6.20	0.0000	0.00	0.0000
4	PCBs 66+80	0.58	0.5784	6.34	5.42	3.02	0.5561	6.69	0.0339	4.23	0.0339
4	PCB 67	ND	0.0000	6.20	5.35	2.95	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 69	ND	0.0000	6.04	5.19	2.79	0.0000	6.38	0.0000	0.00	0.0000
4	PCB 70	0.46	0.4614	6.20	5.40	3.00	0.4593	6.55	0.0381	4.08	0.0381
4	PCBs 71+72	0.50	0.4978	6.12	5.32	2.92	0.5956	6.46	0.0547	3.96	0.0547
4	PCB 73	0.41	0.4150	6.04	5.20	2.80	0.6546	6.38	0.0556	3.87	0.0556
4	PCB 74	ND	0.0000	6.20	5.39	2.99	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 76	ND	0.0000	6.13	5.40	3.00	0.0000	6.47	0.0000	0.00	0.0000
4	PCB 77	ND	0.0000	6.36	5.63	3.23	0.0000	6.71	0.0000	0.00	0.0000
4	PCB 78	ND	0.0000	6.35	5.56	3.16	0.0000	6.70	0.0000	0.00	0.0000
4	PCB 79	0.59	0.5851	6.42	5.53	3.13	0.4317	6.77	0.0264	4.35	0.0264

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
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Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
4	PCBs 81+148	2.31	2.3057	6.55	5.69	3.29	1.1769	6.90	0.1168	4.30	0.1168
5	PCB 82	0.59	0.5923	6.20	5.86	3.46	0.2044	6.55	0.0443	4.13	0.0443
5	PCBs 83+109	ND	0.0000	6.37	5.71	3.31	0.0000	6.72	0.0000	0.00	0.0000
5	PCB 84	0.54	0.5447	6.04	5.61	3.21	0.3343	6.38	0.0684	3.90	0.0684
5	PCBs 85+120	ND	0.0000	6.55	5.70	3.30	0.0000	6.90	0.0000	0.00	0.0000
5	PCBs 97+86+125	0.47	0.4738	6.30	5.71	3.31	0.2328	6.65	0.0270	4.24	0.0270
5	PCBs 87+115	0.85	0.8500	6.39	5.76	3.36	0.3693	6.74	0.0455	4.27	0.0455
5	PCB 88	ND	0.0000	6.07	5.53	3.13	0.0000	6.41	0.0000	0.00	0.0000
5	PCBs 89+90+101	6.77	6.7672	6.27	5.64	3.24	3.9056	6.62	1.0431	3.81	1.0431
5	PCB 91	2.07	2.0731	6.13	5.55	3.15	1.4607	6.47	0.3298	3.80	0.3298
5	PCB 92	0.93	0.9337	6.35	5.61	3.21	0.5730	6.70	0.0610	4.19	0.0610
5	PCB 93	ND	0.0000	6.04	5.51	3.11	0.0000	6.38	0.0000	0.00	0.0000
5	PCB 94	ND	0.0000	6.13	5.47	3.07	0.0000	6.47	0.0000	0.00	0.0000
5	PCBs 95+121	4.36	4.3567	6.39	5.53	3.13	3.2144	6.73	0.4630	3.97	0.4630
5	PCB 96	0.34	0.3413	5.71	5.38	2.98	0.3557	6.05	0.0950	3.56	0.0950
5	PCBs 98+102	ND	0.0000	6.15	5.51	3.11	0.0000	6.49	0.0000	0.00	0.0000
5	PCB 99	1.43	1.4347	6.39	5.66	3.26	0.7847	6.74	0.0962	4.17	0.0962
5	PCB 100	1.64	1.6402	6.23	5.43	3.03	1.5235	6.58	0.1969	3.92	0.1969
5	PCB 103	0.56	0.5646	6.22	5.41	3.01	0.5491	6.57	0.0473	4.08	0.0473
5	PCB 104	ND	0.0000	5.81	5.27		0.0000		0.0000	0.00	0.0000
5	PCB 105	0.62	0.6192	6.65	5.83	3.43	0.2290	7.00	0.0133	4.67	0.0133
5	PCBs 106+118	1.74	1.7411	6.69	5.73	3.33	0.8105	7.04	0.0508	4.54	0.0508

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
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f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
5	PCBs 107+108+123	0.96	0.9594	6.72	5.72	3.33	0.4535	7.07	0.0201	4.68	0.0201
5	PCB 110	3.06	3.0606	6.48	5.81	3.41	1.1851	6.83	0.1967	4.19	0.1967
5	PCBs 111+116+117	ND	0.0000	6.52	5.70	3.31	0.0000	6.87	0.0000	0.00	0.0000
5	PCB 112	ND	0.0000	6.45	5.70	3.30	0.0000	6.80	0.0000	0.00	0.0000
5	PCB 113	ND	0.0000	6.54	5.66	3.26	0.0000	6.89	0.0000	0.00	0.0000
5	PCB 114	ND	0.0000	6.65	5.77	3.37	0.0000	7.00	0.0000	0.00	0.0000
5	PCB 119	2.22	2.2213	6.58	5.69	3.29	1.1338	6.93	0.1001	4.35	0.1001
5	PCB 122	ND	0.0000	6.64	5.78	3.38	0.0000	6.99	0.0000	0.00	0.0000
5	PCB 124	ND	0.0000	6.73	5.71	3.31	0.0000	7.08	0.0000	0.00	0.0000
5	PCB 126	ND	0.0000	6.89	5.95	3.55	0.0000	7.25	0.0000	0.00	0.0000
5	PCB 127	ND	0.0000	6.95	5.83	3.43	0.0000	7.31	0.0000	0.00	0.0000
6	PCB 128	1.11	1.1124	6.74	6.32	3.92	0.1331	7.09	0.0199	4.75	0.0199
6	PCB 129	ND	0.0000	6.73	6.23	3.83	0.0000	7.08	0.0000	0.00	0.0000
6	PCB 130	0.59	0.5879	6.73	6.23	3.83	0.0865	7.08	0.0089	4.82	0.0089
6	PCB 131	ND	0.0000	6.73	6.23	3.83	0.0000	7.08	0.0000	0.00	0.0000
6	PCBs 133+165	ND	0.0000	6.96	6.02	3.62	0.0000	7.31	0.0000	0.00	0.0000
6	PCBs 134+143	0.56	0.5625	6.58	5.98	3.58	0.1472	6.93	0.1086	3.71	0.1086
6	PCB 135	2.58	2.5771	6.64	5.90	3.50	0.8111	6.99	0.0968	4.43	0.0968
6	PCB 136	3.00	2.9989	6.22	5.79	3.39	1.2159	6.57	0.3639	3.92	0.3639
6	PCB 137	ND	0.0000	6.83	6.17	3.77	0.0000	7.19	0.0000	0.00	0.0000
6	PCBs 138+160	10.31	10.3128	6.80	6.07	3.67	2.1944	7.16	0.3789	4.43	0.3789
6	PCBs 139+149	15.65	15.6515	6.67	5.95	3.55	4.4411	7.02	0.9819	4.20	0.9819
6	PCB 140	ND	0.0000	6.67	5.95	3.55	0.0000	7.02	0.0000	0.00	0.0000
6	PCB 141	4.70	4.6979	6.82	6.12	3.72	0.8909	7.18	0.1218	4.59	0.1218
6	PCB 142	0.49	0.4876	6.51	6.00	3.60	0.1219	6.86	0.0140	4.54	0.0140
6	PCB 144	1.06	1.0648	6.67	5.90	3.50	0.3351	7.02	0.0263	4.61	0.0263

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
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f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
6	PCB 145	ND	0.0000	6.25	5.76	3.36	0.0000	6.60	0.0000	0.00	0.0000
6	PCBs 161+146	1.84	1.8400	6.99	6.04	3.64	0.4195	7.34	0.0209	4.95	0.0209
6	PCB 147	100.57	100.5656	6.64	5.92	3.52	30.2266	6.99	11.5282	3.94	11.5282
6	PCB 150	ND	0.0000	6.32	5.69	3.29	0.0000	6.67	0.0000	0.00	0.0000
6	PCB 151	ND	0.0000	6.64	5.88	3.48	0.0000	6.99	0.0000	0.00	0.0000
6	PCB 152	19.09	19.0855	6.22	5.73	3.33	8.8847	6.57	3.8817	3.69	3.8817
6	PCBs 153+132	0.44	0.4422	6.75	6.06	3.66	0.0963	7.10	0.0059	4.88	0.0059
6	PCB 154	ND	0.0000	6.76	5.83	3.43	0.0000	7.12	0.0000	0.00	0.0000
6	PCB 155	0.99	0.9890	6.41	5.59	3.19	0.6355	6.76	0.0557	4.25	0.0557
6	PCB 156	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 157	1.34	1.3415	6.41	5.59	3.19	0.8620	6.76	0.0847	4.20	0.0847
6	PCB 158	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 159	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 162	ND	0.0000	7.24	6.00	3.60	0.0000	7.60	0.0000	0.00	0.0000
6	PCBs 163+164	7.35	7.3508	7.01	6.19	3.79	1.1865	7.36	0.1297	4.75	0.1297
6	PCB 166	ND	0.0000	6.93	6.25	3.85	0.0000	7.29	0.0000	0.00	0.0000
6	PCB 167	0.51	0.5074	6.93	6.25	3.85	0.0713	7.29	0.0040	5.11	0.0040
6	PCB 168	4.05	4.0512	6.93	6.25	3.85	0.5695	7.29	0.0315	5.11	0.0040
6	PCB 169	ND	0.0000	6.93	6.25	3.85	0.0000	7.29	0.0000	0.00	0.0000
7	PCBs 170+190	5.76	5.7577	7.37	6.66	4.26	0.3149	7.73	0.0283	5.31	0.0283
7	PCB 171	2.87	2.8721	7.11	6.43	4.03	0.2668	7.47	0.0245	5.07	0.0245
7	PCBs 172+192	1.82	1.8216	7.43	6.50	4.10	0.1457	7.79	0.0048	5.58	0.0048
7	PCB 173	ND	0.0000	7.02	6.45	4.05	0.0000	7.38	0.0000	0.00	0.0000
7	PCBs 174+181	11.38	11.3785	7.32	6.44	4.04	1.0328	7.68	0.0888	5.11	0.0888
7	PCB 175	ND	0.0000	7.17	6.27	3.87	0.0000	7.53	0.0000	0.00	0.0000
7	PCB 176	1.51	1.5122	6.76	6.16	3.76	0.2616	7.12	0.0304	4.70	0.0304
7	PCB 177	6.42	6.4173	7.08	6.41	4.01	0.6242	7.44	0.0807	4.90	0.0807

Sediment Congener Calculations MIT

Porewater Station PW004

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Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
7	PCB 178	2.30	2.3001	7.08	6.41	4.01	0.2237	7.44	0.0198	5.07	0.0198
7	PCB 179	4.74	4.7416	7.08	6.41	4.01	0.4612	7.44	0.0534	4.95	0.0534
7	PCBs 180+193	27.70	27.7030	7.44	6.54	4.14	2.0205	7.81	0.2041	5.13	0.2041
7	PCBs 182+187	14.30	14.3030	7.19	6.28	3.88	1.8766	7.55	0.1865	4.88	0.1865
7	PCB 183	6.40	6.3975	7.20	6.30	3.90	0.8016	7.56	0.0584	5.04	0.0584
7	PCB 184	0.75	0.7515	7.20	6.30	3.90	0.0942	7.56	0.0029	5.41	0.0029
7	PCB 185	1.33	1.3284	7.20	6.30	3.90	0.1664	7.56	0.0065	5.31	0.0065
7	PCB 186	ND	0.0000	7.20	6.30	3.90	0.0000	7.56	0.0000	0.00	0.0000
7	PCB188	ND	0.0000	6.82	6.02	3.62	0.0000	7.18	0.0000	0.00	0.0000
7	PCB 189	0.60	0.6042	6.82	6.02	3.62	0.1443	7.18	0.0074	4.91	0.0074
7	PCB 191	0.54	0.5410	7.55	6.56	4.16	0.0372	7.92	0.0006	5.97	0.0006
8	PCB 194	7.43	7.4346	7.80	6.96	4.56	0.2038	8.17	0.0101	5.87	0.0101
8	PCB 195	3.63	3.6296	7.56	6.86	4.46	0.1253	7.93	0.0079	5.66	0.0079
8	PCBs 196+203	7.92	7.9172	7.65	6.73	4.33	0.3686	8.02	0.0182	5.64	0.0182
8	PCB 198	ND	0.0000	7.62	6.69	4.29	0.0000	7.99	0.0000	0.00	0.0000
8	PCB 199	6.74	6.7413	7.20	6.57	4.17	0.4536	7.56	0.0581	5.06	0.0581
8	PCB 200	1.01	1.0135	7.27	6.47	4.07	0.0859	7.63	0.0035	5.46	0.0035
8	PCB 201	ND	0.0000	7.62	6.71	4.31	0.0000	7.99	0.0000	0.00	0.0000
8	PCB 202	ND	0.0000	7.24	6.43	4.03	0.0000	7.60	0.0000	0.00	0.0000
8	PCB 204	ND	0.0000	7.30	6.48	4.08	0.0000	7.66	0.0000	0.00	0.0000
8	PCB 205	ND	0.0000	8.00	6.99	4.59	0.0000	8.37	0.0000	0.00	0.0000
8	PCB 206	2.38	2.3820	8.09	7.13	4.73	0.0441	8.47	0.0008	6.48	0.0008
9	PCB 207	ND	0.0000	7.74	6.90	4.50	0.0000	8.11	0.0000	0.00	0.0000
9	PCB 208	ND	0.0000	7.71	6.86	4.46	0.0000	8.08	0.0000	0.00	0.0000
10	PCB 209	ND	0.0000	8.18	7.27	4.87	0.0000	8.56	0.0000	0.00	0.0000

Notes:

Performance Reference Compounds

Injection Standards

PRCs not included in porewater calculations

0.00

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
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Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
1	PCB 1	ND	0.0000	4.46	4.40	2.00	4.4000	4.78	0.0000	0.00	0.0000
1	PCB 2	ND	0.0000	4.69	4.51	2.11	0.0000	5.01	0.0000	0.00	0.0000
1	PCB 3	ND	0.0000	4.69	4.52	2.12	0.0000	5.01	0.0000	0.00	0.0000
2	PCBs 4 + 10	0.70	0.7022	4.75	4.40	2.00	6.9892	5.07	3.7597	2.27	3.7597
2	PCBs 5 + 8	ND	0.0000	5.02	4.72	2.32	0.0000	5.35	0.0000	0.00	0.0000
2	PCB 6	ND	0.0000	5.06	4.71	2.31	0.0000	5.39	0.0000	0.00	0.0000
2	PCBs 7 + 9	ND	0.0000	5.07	4.67	2.27	0.0000	5.39	0.0000	0.00	0.0000
2	PCB 11	ND	0.0000	5.28	4.84	2.44	0.0000	5.61	0.0000	0.00	0.0000
2	PCB 12	ND	0.0000	5.22	4.86	2.46	0.0000	5.55	0.0000	0.00	0.0000
2	PCB 13	ND	0.0000	5.29	4.86	2.46	0.0000	5.62	0.0000	0.00	0.0000
2	PCB 14	1.10	1.1043	5.28	4.77	2.37	4.6885	5.61	1.7517	2.80	1.7517
2	PCB 15	ND	0.0000	5.30	4.88	2.48	0.0000	5.63	0.0000	0.00	0.0000
3	PCBs 16 + 32	0.71	0.7116	5.30	4.88	2.48	2.3453	5.63	0.8753	2.91	0.8753
3	PCB 17	0.64	0.6351	5.25	4.80	2.40	2.5163	5.58	0.9041	2.85	0.9041
3	PCB 18	ND	0.0000	5.24	4.79	2.39	0.0000	5.57	0.0000	0.00	0.0000
3	PCB 19	1.66	1.6570	5.02	4.67	2.27	8.8565	5.35	4.9030	2.53	4.9030
3	PCBs 20+21+33	0.98	0.9760	5.56	5.08	2.68	2.0451	5.90	0.6449	3.18	0.6449
3	PCB 22	ND	0.0000	5.51	5.07	2.67	0.0000	5.85	0.0000	0.00	0.0000
3	PCBs 23 + 34	ND	0.0000	5.62	4.98	2.58	0.0000	5.95	0.0000	0.00	0.0000
3	PCBs 24+27	0.41	0.4125	5.40	4.82	2.42	1.5789	5.73	0.3755	3.04	0.3755
3	PCBs 25+26	ND	0.0000	5.67	5.02	2.62	0.0000	6.00	0.0000	0.00	0.0000
3	PCBs 28+31	0.38	0.3832	5.67	5.05	2.65	0.8638	6.01	0.1498	3.41	0.1498
3	PCB 29	ND	0.0000	5.60	4.99	2.59	0.0000	5.94	0.0000	0.00	0.0000
3	PCB 30	ND	0.0000	5.44	4.72	2.32	0.0000	5.77	0.0000	0.00	0.0000
3	PCB 35	ND	0.0000	5.82	5.23	2.83	0.0000	6.16	0.0000	0.00	0.0000
3	PCB 36	1.84	1.8378	5.88	5.15	2.75	3.2526	6.22	0.6636	3.44	0.6636
3	PCB 37	ND	0.0000	5.83	5.26	2.86	0.0000	6.17	0.0000	0.00	0.0000
3	PCB 38	ND	0.0000	5.76	5.19	2.79	0.0000	6.10	0.0000	0.00	0.0000
3	PCB 39	ND	0.0000	5.89	5.16	2.76	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 40	ND	0.0000	5.66	5.39	2.99	0.0000	6.00	0.0000	0.00	0.0000

Sediment Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%					
f_{BC}=	0.03%					

	Concentration	log Kow	log Koc
	From Table 7-1	Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
		Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
4	PCBs 41+64+68	ND	0.0000	5.97	5.34	2.94	0.0000	6.31	0.0000	0.00	0.0000
4	PCB 42	ND	0.0000	5.76	5.31	2.91	0.0000	6.10	0.0000	0.00	0.0000
4	PCB 43	ND	0.0000	5.75	5.21	2.81	0.0000	6.09	0.0000	0.00	0.0000
4	PCB 44	ND	0.0000	5.75	5.30	2.90	0.0000	6.09	0.0000	0.00	0.0000
4	PCB 45	ND	0.0000	5.53	5.12	2.72	0.0000	5.87	0.0000	0.00	0.0000
4	PCB 46	ND	0.0000	5.53	5.16	2.76	0.0000	5.87	0.0000	0.00	0.0000
4	PCBs 47+48+75	3.69	3.6942	5.89	5.23	2.83	5.4383	6.23	1.5156	3.39	1.5156
4	PCB 49	2.33	2.3258	5.85	5.22	2.82	3.5035	6.19	0.9272	3.40	0.9272
4	PCB 50	ND	0.0000	5.63	5.01	2.61	0.0000	5.97	0.0000	0.00	0.0000
4	PCB 52	2.89	2.8926	5.84	5.20	2.80	4.5627	6.18	1.2752	3.36	1.2752
4	PCB 54	0.49	0.4875	5.21	4.94	2.54	1.3993	5.54	0.6066	2.91	0.6066
4	PCB 55	ND	0.0000	6.11	5.44	3.04	0.0000	6.45	0.0000	0.00	0.0000
4	PCBs 56+60	ND	0.0000	6.11	5.47	3.07	0.0000	6.45	0.0000	0.00	0.0000
4	PCB 57	ND	0.0000	6.17	5.34	2.94	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 58	ND	0.0000	6.17	5.37	2.97	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 59	ND	0.0000	5.95	5.31	2.91	0.0000	6.29	0.0000	0.00	0.0000
4	PCB 61	ND	0.0000	6.04	5.38	2.98	0.0000	6.38	0.0000	0.00	0.0000
4	PCB 62	ND	0.0000	5.89	5.25	2.85	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 63	1.21	1.2107	6.17	5.37	2.97	1.2912	6.52	0.1576	3.89	0.1576
4	PCB 65	ND	0.0000	5.86	5.24	2.84	0.0000	6.20	0.0000	0.00	0.0000
4	PCBs 66+80	0.58	0.5784	6.34	5.42	3.02	0.5561	6.69	0.0339	4.23	0.0339
4	PCB 67	ND	0.0000	6.20	5.35	2.95	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 69	ND	0.0000	6.04	5.19	2.79	0.0000	6.38	0.0000	0.00	0.0000
4	PCB 70	0.46	0.4614	6.20	5.40	3.00	0.4593	6.55	0.0381	4.08	0.0381
4	PCBs 71+72	0.50	0.4978	6.12	5.32	2.92	0.5956	6.46	0.0547	3.96	0.0547
4	PCB 73	0.41	0.4150	6.04	5.20	2.80	0.6546	6.38	0.0556	3.87	0.0556
4	PCB 74	ND	0.0000	6.20	5.39	2.99	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 76	ND	0.0000	6.13	5.40	3.00	0.0000	6.47	0.0000	0.00	0.0000
4	PCB 77	ND	0.0000	6.36	5.63	3.23	0.0000	6.71	0.0000	0.00	0.0000
4	PCB 78	ND	0.0000	6.35	5.56	3.16	0.0000	6.70	0.0000	0.00	0.0000
4	PCB 79	0.59	0.5851	6.42	5.53	3.13	0.4317	6.77	0.0264	4.35	0.0264

Sediment Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.40%			Concentration	log Kow	log Koc
f_{OC}=	0.37%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{BC}=	0.03%			From Table 7-1	Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
					Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
4	PCBs 81+148	2.31	2.3057	6.55	5.69	3.29	1.1769	6.90	0.1168	4.30	0.1168
5	PCB 82	0.59	0.5923	6.20	5.86	3.46	0.2044	6.55	0.0443	4.13	0.0443
5	PCBs 83+109	ND	0.0000	6.37	5.71	3.31	0.0000	6.72	0.0000	0.00	0.0000
5	PCB 84	0.54	0.5447	6.04	5.61	3.21	0.3343	6.38	0.0684	3.90	0.0684
5	PCBs 85+120	ND	0.0000	6.55	5.70	3.30	0.0000	6.90	0.0000	0.00	0.0000
5	PCBs 97+86+125	0.47	0.4738	6.30	5.71	3.31	0.2328	6.65	0.0270	4.24	0.0270
5	PCBs 87+115	0.85	0.8500	6.39	5.76	3.36	0.3693	6.74	0.0455	4.27	0.0455
5	PCB 88	ND	0.0000	6.07	5.53	3.13	0.0000	6.41	0.0000	0.00	0.0000
5	PCBs 89+90+101	6.77	6.7672	6.27	5.64	3.24	3.9056	6.62	1.0431	3.81	1.0431
5	PCB 91	2.07	2.0731	6.13	5.55	3.15	1.4607	6.47	0.3298	3.80	0.3298
5	PCB 92	0.93	0.9337	6.35	5.61	3.21	0.5730	6.70	0.0610	4.19	0.0610
5	PCB 93	ND	0.0000	6.04	5.51	3.11	0.0000	6.38	0.0000	0.00	0.0000
5	PCB 94	ND	0.0000	6.13	5.47	3.07	0.0000	6.47	0.0000	0.00	0.0000
5	PCBs 95+121	4.36	4.3567	6.39	5.53	3.13	3.2144	6.73	0.4630	3.97	0.4630
5	PCB 96	0.34	0.3413	5.71	5.38	2.98	0.3557	6.05	0.0950	3.56	0.0950
5	PCBs 98+102	ND	0.0000	6.15	5.51	3.11	0.0000	6.49	0.0000	0.00	0.0000
5	PCB 99	1.43	1.4347	6.39	5.66	3.26	0.7847	6.74	0.0962	4.17	0.0962
5	PCB 100	1.64	1.6402	6.23	5.43	3.03	1.5235	6.58	0.1969	3.92	0.1969
5	PCB 103	0.56	0.5646	6.22	5.41	3.01	0.5491	6.57	0.0473	4.08	0.0473
5	PCB 104	ND	0.0000	5.81	5.27		0.0000		0.0000	0.00	0.0000
5	PCB 105	0.62	0.6192	6.65	5.83	3.43	0.2290	7.00	0.0133	4.67	0.0133
5	PCBs 106+118	1.74	1.7411	6.69	5.73	3.33	0.8105	7.04	0.0508	4.54	0.0508
5	PCBs 107+108+123	0.96	0.9594	6.72	5.72	3.33	0.4535	7.07	0.0201	4.68	0.0201
5	PCB 110	3.06	3.0606	6.48	5.81	3.41	1.1851	6.83	0.1967	4.19	0.1967
5	PCBs 111+116+117	ND	0.0000	6.52	5.70	3.31	0.0000	6.87	0.0000	0.00	0.0000

Sediment Congener Calculations MIT

Porewater Station PW004

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Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
5	PCB 112	ND	0.0000	6.45	5.70	3.30	0.0000	6.80	0.0000	0.00	0.0000
5	PCB 113	ND	0.0000	6.54	5.66	3.26	0.0000	6.89	0.0000	0.00	0.0000
5	PCB 114	ND	0.0000	6.65	5.77	3.37	0.0000	7.00	0.0000	0.00	0.0000
5	PCB 119	2.22	2.2213	6.58	5.69	3.29	1.1338	6.93	0.1001	4.35	0.1001
5	PCB 122	ND	0.0000	6.64	5.78	3.38	0.0000	6.99	0.0000	0.00	0.0000
5	PCB 124	ND	0.0000	6.73	5.71	3.31	0.0000	7.08	0.0000	0.00	0.0000
5	PCB 126	ND	0.0000	6.89	5.95	3.55	0.0000	7.25	0.0000	0.00	0.0000
5	PCB 127	ND	0.0000	6.95	5.83	3.43	0.0000	7.31	0.0000	0.00	0.0000
6	PCB 128	1.11	1.1124	6.74	6.32	3.92	0.1331	7.09	0.0199	4.75	0.0199
6	PCB 129	ND	0.0000	6.73	6.23	3.83	0.0000	7.08	0.0000	0.00	0.0000
6	PCB 130	0.59	0.5879	6.73	6.23	3.83	0.0865	7.08	0.0089	4.82	0.0089
6	PCB 131	ND	0.0000	6.73	6.23	3.83	0.0000	7.08	0.0000	0.00	0.0000
6	PCBs 133+165	ND	0.0000	6.96	6.02	3.62	0.0000	7.31	0.0000	0.00	0.0000
6	PCBs 134+143	0.56	0.5625	6.58	5.98	3.58	0.1472	6.93	0.1086	3.71	0.1086
6	PCB 135	2.58	2.5771	6.64	5.90	3.50	0.8111	6.99	0.0968	4.43	0.0968
6	PCB 136	3.00	2.9989	6.22	5.79	3.39	1.2159	6.57	0.3639	3.92	0.3639
6	PCB 137	ND	0.0000	6.83	6.17	3.77	0.0000	7.19	0.0000	0.00	0.0000
6	PCBs 138+160	10.31	10.3128	6.80	6.07	3.67	2.1944	7.16	0.3789	4.43	0.3789
6	PCBs 139+149	15.65	15.6515	6.67	5.95	3.55	4.4411	7.02	0.9819	4.20	0.9819
6	PCB 140	ND	0.0000	6.67	5.95	3.55	0.0000	7.02	0.0000	0.00	0.0000
6	PCB 141	4.70	4.6979	6.82	6.12	3.72	0.8909	7.18	0.1218	4.59	0.1218
6	PCB 142	0.49	0.4876	6.51	6.00	3.60	0.1219	6.86	0.0140	4.54	0.0140
6	PCB 144	1.06	1.0648	6.67	5.90	3.50	0.3351	7.02	0.0263	4.61	0.0263
6	PCB 145	ND	0.0000	6.25	5.76	3.36	0.0000	6.60	0.0000	0.00	0.0000
6	PCBs 161+146	1.84	1.8400	6.99	6.04	3.64	0.4195	7.34	0.0209	4.95	0.0209
6	PCB 147	100.57	100.5656	6.64	5.92	3.52	30.2266	6.99	11.5282	3.94	11.5282
6	PCB 150	ND	0.0000	6.32	5.69	3.29	0.0000	6.67	0.0000	0.00	0.0000
6	PCB 151	ND	0.0000	6.64	5.88	3.48	0.0000	6.99	0.0000	0.00	0.0000
6	PCB 152	19.09	19.0855	6.22	5.73	3.33	8.8847	6.57	3.8817	3.69	3.8817
6	PCBs 153+132	0.44	0.4422	6.75	6.06	3.66	0.0963	7.10	0.0059	4.88	0.0059
6	PCB 154	ND	0.0000	6.76	5.83	3.43	0.0000	7.12	0.0000	0.00	0.0000
6	PCB 155	0.99	0.9890	6.41	5.59	3.19	0.6355	6.76	0.0557	4.25	0.0557
6	PCB 156	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
6	PCB 157	1.34	1.3415	6.41	5.59	3.19	0.8620	6.76	0.0847	4.20	0.0847
6	PCB 158	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 159	ND	0.0000	6.41	5.59	3.19	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 162	ND	0.0000	7.24	6.00	3.60	0.0000	7.60	0.0000	0.00	0.0000
6	PCBs 163+164	7.35	7.3508	7.01	6.19	3.79	1.1865	7.36	0.1297	4.75	0.1297
6	PCB 166	ND	0.0000	6.93	6.25	3.85	0.0000	7.29	0.0000	0.00	0.0000
6	PCB 167	0.51	0.5074	6.93	6.25	3.85	0.0713	7.29	0.0040	5.11	0.0040
6	PCB 168	4.05	4.0512	6.93	6.25	3.85	0.5695	7.29	0.0315	5.11	0.0040
6	PCB 169	ND	0.0000	6.93	6.25	3.85	0.0000	7.29	0.0000	0.00	0.0000
7	PCBs 170+190	5.76	5.7577	7.37	6.66	4.26	0.3149	7.73	0.0283	5.31	0.0283
7	PCB 171	2.87	2.8721	7.11	6.43	4.03	0.2668	7.47	0.0245	5.07	0.0245
7	PCBs 172+192	1.82	1.8216	7.43	6.50	4.10	0.1457	7.79	0.0048	5.58	0.0048
7	PCB 173	ND	0.0000	7.02	6.45	4.05	0.0000	7.38	0.0000	0.00	0.0000
7	PCBs 174+181	11.38	11.3785	7.32	6.44	4.04	1.0328	7.68	0.0888	5.11	0.0888
7	PCB 175	ND	0.0000	7.17	6.27	3.87	0.0000	7.53	0.0000	0.00	0.0000
7	PCB 176	1.51	1.5122	6.76	6.16	3.76	0.2616	7.12	0.0304	4.70	0.0304
7	PCB 177	6.42	6.4173	7.08	6.41	4.01	0.6242	7.44	0.0807	4.90	0.0807
7	PCB 178	2.30	2.3001	7.08	6.41	4.01	0.2237	7.44	0.0198	5.07	0.0198
7	PCB 179	4.74	4.7416	7.08	6.41	4.01	0.4612	7.44	0.0534	4.95	0.0534
7	PCBs 180+193	27.70	27.7030	7.44	6.54	4.14	2.0205	7.81	0.2041	5.13	0.2041
7	PCBs 182+187	14.30	14.3030	7.19	6.28	3.88	1.8766	7.55	0.1865	4.88	0.1865
7	PCB 183	6.40	6.3975	7.20	6.30	3.90	0.8016	7.56	0.0584	5.04	0.0584
7	PCB 184	0.75	0.7515	7.20	6.30	3.90	0.0942	7.56	0.0029	5.41	0.0029
7	PCB 185	1.33	1.3284	7.20	6.30	3.90	0.1664	7.56	0.0065	5.31	0.0065
7	PCB 186	ND	0.0000	7.20	6.30	3.90	0.0000	7.56	0.0000	0.00	0.0000
7	PCB188	ND	0.0000	6.82	6.02	3.62	0.0000	7.18	0.0000	0.00	0.0000
7	PCB 189	0.60	0.6042	6.82	6.02	3.62	0.1443	7.18	0.0074	4.91	0.0074
7	PCB 191	0.54	0.5410	7.55	6.56	4.16	0.0372	7.92	0.0006	5.97	0.0006
8	PCB 194	7.43	7.4346	7.80	6.96	4.56	0.2038	8.17	0.0101	5.87	0.0101
8	PCB 195	3.63	3.6296	7.56	6.86	4.46	0.1253	7.93	0.0079	5.66	0.0079
8	PCBs 196+203	7.92	7.9172	7.65	6.73	4.33	0.3686	8.02	0.0182	5.64	0.0182
8	PCB 198	ND	0.0000	7.62	6.69	4.29	0.0000	7.99	0.0000	0.00	0.0000
8	PCB 199	6.74	6.7413	7.20	6.57	4.17	0.4536	7.56	0.0581	5.06	0.0581
8	PCB 200	1.01	1.0135	7.27	6.47	4.07	0.0859	7.63	0.0035	5.46	0.0035

Sediment Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.40%	RI Calc Total PCB Congeners	433	µg/kg	6.14	5.68
f_{OC}=	0.37%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.03%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimated Resuls

Sum Total Sediment PCB Congeners OC Porewater Calc.	78.38	ng/L
Congener OC Porewater Calc.	138.01	ng/L
Congener OC+BC Porewater Calc.	40.46	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
8	PCB 201	ND	0.0000	7.62	6.71	4.31	0.0000	7.99	0.0000	0.00	0.0000
8	PCB 202	ND	0.0000	7.24	6.43	4.03	0.0000	7.60	0.0000	0.00	0.0000
8	PCB 204	ND	0.0000	7.30	6.48	4.08	0.0000	7.66	0.0000	0.00	0.0000
8	PCB 205	ND	0.0000	8.00	6.99	4.59	0.0000	8.37	0.0000	0.00	0.0000
8	PCB 206	2.38	2.3820	8.09	7.13	4.73	0.0441	8.47	0.0008	6.48	0.0008
9	PCB 207	ND	0.0000	7.74	6.90	4.50	0.0000	8.11	0.0000	0.00	0.0000
9	PCB 208	ND	0.0000	7.71	6.86	4.46	0.0000	8.08	0.0000	0.00	0.0000
10	PCB 209	ND	0.0000	8.18	7.27	4.87	0.0000	8.56	0.0000	0.00	0.0000

Notes:

Performance Reference Compounds

Injection Standards

PRCs not included in porewater calculations

0.00

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999

: Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.64%
f_{OC}=	0.39%
f_{BC}=	0.25%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
			Total PCB Kow LWG Bioaccumulation Model	

Summary Estimate

Sum Total Sediment PCB Congeners OC Porewater Calc.	35.20	ng/L
Congener OC Porewater Calc.	838.07	ng/L
Congener OC+BC Porewater Calc.	151.22	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
1	PCB 1	ND	0.0000	4.46	4.40	2.21	0.0000	4.78	0.0000	0.00	0.0000
1	PCB 2	ND	0.0000	4.69	4.51	2.32	0.0000	5.01	0.0000	0.00	0.0000
1	PCB 3	ND	0.0000	4.69	4.52	2.33	0.0000	5.01	0.0000	0.00	0.0000
2	PCBs 4 + 10	14.32	14.3162	4.75	4.40	2.21	89.0531	5.07	26.9599	2.73	26.9599
2	PCBs 5 + 8	1.77	1.7722	5.02	4.72	2.53	5.2765	5.35	0.6508	3.44	0.6508
2	PCB 6	ND	0.0000	5.06	4.71	2.52	0.0000	5.39	0.0000	0.00	0.0000
2	PCBs 7 + 9	1.57	1.5698	5.07	4.67	2.48	5.2439	5.39	0.4846	3.51	0.4846
2	PCB 11	ND	0.0000	5.28	4.84	2.65	0.0000	5.61	0.0000	0.00	0.0000
2	PCB 12	ND	0.0000	5.22	4.86	2.67	0.0000	5.55	0.0000	0.00	0.0000
2	PCB 13	ND	0.0000	5.29	4.86	2.67	0.0000	5.62	0.0000	0.00	0.0000
2	PCB 14	ND	0.0000	5.28	4.77	2.58	0.0000	5.61	0.0000	0.00	0.0000
2	PCB 15	ND	0.0000	5.30	4.88	2.69	0.0000	5.63	0.0000	0.00	0.0000
3	PCBs 16 + 32	11.67	11.6722	5.30	4.88	2.69	24.0422	5.63	3.6684	3.50	3.6684
3	PCB 17	31.11	31.1057	5.25	4.80	2.61	77.0300	5.58	16.5455	3.27	16.5455
3	PCB 18	3.05	3.0458	5.24	4.79	2.60	7.7184	5.57	0.6974	3.64	0.6974
3	PCB 19	48.82	48.8218	5.02	4.67	2.48	163.0925	5.35	58.4080	2.92	58.4080
3	PCBs 20+21+33	3.64	3.6399	5.56	5.08	2.88	4.7669	5.90	0.3156	4.06	0.3156
3	PCB 22	ND	0.0000	5.51	5.07	2.88	0.0000	5.85	0.0000	0.00	0.0000
3	PCBs 23 + 34	ND	0.0000	5.62	4.98	2.79	0.0000	5.95	0.0000	0.00	0.0000
3	PCBs 24+27	6.93	6.9342	5.40	4.82	2.62	16.5889	5.73	1.3563	3.71	1.3563
3	PCBs 25+26	2.98	2.9846	5.67	5.02	2.83	4.4535	6.00	0.1716	4.24	0.1716
3	PCBs 28+31	7.39	7.3927	5.67	5.05	2.85	10.4142	6.01	0.6057	4.09	0.6057
3	PCB 29	ND	0.0000	5.60	4.99	2.80	0.0000	5.94	0.0000	0.00	0.0000
3	PCB 30	ND	0.0000	5.44	4.72	2.53	0.0000	5.77	0.0000	0.00	0.0000
3	PCB 35	ND	0.0000	5.82	5.23	3.04	0.0000	6.16	0.0000	0.00	0.0000
3	PCB 36	2.38	2.3803	5.88	5.15	2.96	2.6330	6.22	0.0614	4.59	0.0614
3	PCB 37	ND	0.0000	5.83	5.26	3.07	0.0000	6.17	0.0000	0.00	0.0000
3	PCB 38	6.26	6.2560	5.76	5.19	3.00	6.3113	6.10	0.3539	4.25	0.3539
3	PCB 39	ND	0.0000	5.89	5.16	2.97	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 40	ND	0.0000	5.66	5.39	3.20	0.0000	6.00	0.0000	0.00	0.0000
4	PCBs 41+64+68	2.74	2.7429	5.97	5.34	3.15	1.9590	6.31	0.0560	4.69	0.0560
4	PCB 42	ND	0.0000	5.76	5.31	3.12	0.0000	6.10	0.0000	0.00	0.0000
4	PCB 43	ND	0.0000	5.75	5.21	3.02	0.0000	6.09	0.0000	0.00	0.0000
4	PCB 44	1.60	1.5995	5.75	5.30	3.11	1.2526	6.09	0.0528	4.48	0.0528
4	PCB 45	ND	0.0000	5.53	5.12	2.93	0.0000	5.87	0.0000	0.00	0.0000

: Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.64%
f_{OC}=	0.39%
f_{BC}=	0.25%

	Concentration		log Kow	log Koc
RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
	From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
			Total PCB Kow LWG Bioaccumulation Model	

Summary Estimate

Sum Total Sediment PCB Congeners OC Porewater Calc.	35.20	ng/L
Congener OC Porewater Calc.	838.07	ng/L
Congener OC+BC Porewater Calc.	151.22	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
4	PCB 46	2.35	2.3517	5.53	5.16	2.97	2.5422	5.87	0.1858	4.10	0.1858
4	PCBs 47+48+75	143.32	143.3196	5.89	5.23	3.04	131.8638	6.23	18.3932	3.89	18.3932
4	PCB 49	37.57	37.5671	5.85	5.22	3.03	35.3694	6.19	3.2799	4.06	3.2799
4	PCB 50	6.38	6.3812	5.63	5.01	2.82	9.7437	5.97	0.5613	4.06	0.5613
4	PCB 52	28.81	28.8111	5.84	5.20	3.01	28.4040	6.18	2.3433	4.09	2.3433
4	PCB 54	17.75	17.7543	5.21	4.94	2.75	31.8510	5.54	8.1431	3.34	8.1431
4	PCB 55	ND	0.0000	6.11	5.44	3.25	0.0000	6.45	0.0000	0.00	0.0000
4	PCBs 56+60	ND	0.0000	6.11	5.47	3.28	0.0000	6.45	0.0000	0.00	0.0000
4	PCB 57	ND	0.0000	6.17	5.34	3.15	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 58	ND	0.0000	6.17	5.37	3.18	0.0000	6.52	0.0000	0.00	0.0000
4	PCB 59	ND	0.0000	5.95	5.31	3.12	0.0000	6.29	0.0000	0.00	0.0000
4	PCB 61	ND	0.0000	6.04	5.38	3.19	0.0000	6.38	0.0000	0.00	0.0000
4	PCB 62	ND	0.0000	5.89	5.25	3.06	0.0000	6.23	0.0000	0.00	0.0000
4	PCB 63	1.64	1.6371	6.17	5.37	3.18	1.0912	6.52	0.0138	5.08	0.0138
4	PCB 65	ND	0.0000	5.86	5.24	3.05	0.0000	6.20	0.0000	0.00	0.0000
4	PCBs 66+80	2.23	2.2299	6.34	5.42	3.22	1.3400	6.69	0.0122	5.26	0.0122
4	PCB 67	ND	0.0000	6.20	5.35	3.16	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 69	3.39	3.3871	6.04	5.19	3.00	3.4170	6.38	0.0598	4.75	0.0598
4	PCB 70	2.22	2.2163	6.20	5.40	3.21	1.3787	6.55	0.0192	5.06	0.0192
4	PCBs 71+72	6.60	6.6012	6.12	5.32	3.13	4.9367	6.46	0.1181	4.75	0.1181
4	PCB 73	3.59	3.5888	6.04	5.20	3.01	3.5381	6.38	0.0649	4.74	0.0649
4	PCB 74	ND	0.0000	6.20	5.39	3.20	0.0000	6.55	0.0000	0.00	0.0000
4	PCB 76	ND	0.0000	6.13	5.40	3.21	0.0000	6.47	0.0000	0.00	0.0000
4	PCB 77	ND	0.0000	6.36	5.63	3.44	0.0000	6.71	0.0000	0.00	0.0000
4	PCB 78	ND	0.0000	6.35	5.56	3.37	0.0000	6.70	0.0000	0.00	0.0000
4	PCB 79	ND	0.0000	6.42	5.53	3.34	0.0000	6.77	0.0000	0.00	0.0000
4	PCBs 81+148	2.72	2.7224	6.55	5.69	3.50	0.8685	6.90	0.0082	5.52	0.0082
5	PCB 82	1.95	1.9517	6.20	5.86	3.67	0.4210	6.55	0.0157	5.10	0.0157
5	PCBs 83+109	ND	0.0000	6.37	5.71	3.52	0.0000	6.72	0.0000	0.00	0.0000
5	PCB 84	2.69	2.6945	6.04	5.61	3.42	1.0335	6.38	0.0422	4.80	0.0422
5	PCBs 85+120	ND	0.0000	6.55	5.70	3.51	0.0000	6.90	0.0000	0.00	0.0000
5	PCBs 97+86+125	3.00	3.0031	6.30	5.71	3.51	0.9220	6.65	0.0210	5.15	0.0210
5	PCBs 87+115	ND	0.0000	6.39	5.76	3.57	0.0000	6.74	0.0000	0.00	0.0000
5	PCB 88	32.70	32.7026	6.07	5.53	3.34	15.0801	6.41	1.2977	4.40	1.2977
5	PCBs 89+90+101	21.96	21.9609	6.27	5.64	3.44	7.9214	6.62	0.3894	4.75	0.3894

: Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.64%	RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
f_{OC}=	0.39%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.25%				Total PCB Kow LWG Bioaccumulation Model	

	Concentration	log Kow	log Koc

Summary Estimate

Sum Total Sediment PCB Congeners OC Porewater Calc.	35.20	ng/L
Congener OC Porewater Calc.	838.07	ng/L
Congener OC+BC Porewater Calc.	151.22	ng/L

Estimated Sediment PCB Mass By Congener				**Organic Carbon Model**				**Black Carbon Model**			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
5	PCB 91	5.12	5.1155	6.13	5.55	3.36	2.2527	6.47	0.0786	4.81	0.0786
5	PCB 92	ND	0.0000	6.35	5.61	3.42	0.0000	6.70	0.0000	0.00	0.0000
5	PCB 93	3.93	3.9327	6.04	5.51	3.32	1.8989	6.38	0.0727	4.73	0.0727
5	PCB 94	21.20	21.2027	6.13	5.47	3.28	11.2256	6.47	0.5895	4.56	0.5895
5	PCBs 95+121	5.07	5.0706	6.39	5.53	3.34	2.3382	6.73	0.0337	5.18	0.0337
5	PCB 96	2.90	2.8989	5.71	5.38	3.19	1.8882	6.05	0.1373	4.32	0.1373
5	PCBs 98+102	4.79	4.7900	6.15	5.51	3.31	2.3397	6.49	0.0684	4.85	0.0684
5	PCB 99	8.82	8.8233	6.39	5.66	3.47	3.0161	6.74	0.0725	5.09	0.0725
5	PCB 100	27.34	27.3425	6.23	5.43	3.24	15.8730	6.58	0.6145	4.65	0.6145
5	PCB 103	6.30	6.3044	6.22	5.41	3.22	3.8324	6.57	0.0794	4.90	0.0794
5	PCB 104	ND	0.0000	5.81	5.27		0.0000		0.0000	0.00	0.0000
5	PCB 105	ND	0.0000	6.65	5.83	3.64	0.0000	7.00	0.0000	0.00	0.0000
5	PCBs 106+118	5.04	5.0363	6.69	5.73	3.54	1.4653	7.04	0.0121	5.62	0.0121
5	PCBs	3.26	3.2585	6.72	5.72	3.53	0.9627	7.07	0.0059	5.74	0.0059
5	PCB 110	11.13	11.1284	6.48	5.81	3.62	2.6931	6.83	0.0745	5.17	0.0745
5	PCBs	2.07	2.0675	6.52	5.70	3.51	0.6396	6.87	0.0060	5.53	0.0060
5	PCB 112	ND	0.0000	6.45	5.70	3.51	0.0000	6.80	0.0000	0.00	0.0000
5	PCB 113	ND	0.0000	6.54	5.66	3.47	0.0000	6.89	0.0000	0.00	0.0000
5	PCB 114	ND	0.0000	6.65	5.77	3.58	0.0000	7.00	0.0000	0.00	0.0000
5	PCB 119	6.22	6.2223	6.58	5.69	3.50	1.9850	6.93	0.0236	5.42	0.0236
5	PCB 122	ND	0.0000	6.64	5.78	3.59	0.0000	6.99	0.0000	0.00	0.0000
5	PCB 124	ND	0.0000	6.73	5.71	3.52	0.0000	7.08	0.0000	0.00	0.0000
5	PCB 126	ND	0.0000	6.89	5.95	3.76	0.0000	7.25	0.0000	0.00	0.0000
5	PCB 127	ND	0.0000	6.95	5.83	3.64	0.0000	7.31	0.0000	0.00	0.0000
6	PCB 128	3.93	3.9263	6.74	6.32	4.13	0.2936	7.09	0.0071	5.74	0.0071
6	PCB 129	ND	0.0000	6.73	6.23	4.04	0.0000	7.08	0.0000	0.00	0.0000
6	PCB 130	ND	0.0000	6.73	6.23	4.04	0.0000	7.08	0.0000	0.00	0.0000
6	PCB 131	ND	0.0000	6.73	6.23	4.04	0.0000	7.08	0.0000	0.00	0.0000
6	PCBs 133+165	ND	0.0000	6.96	6.02	3.82	0.0000	7.31	0.0000	0.00	0.0000
6	PCBs 134+143	2.94	2.9371	6.58	5.98	3.79	0.4805	6.93	0.0082	5.56	0.0082
6	PCB 135	8.53	8.5328	6.64	5.90	3.71	1.6785	6.99	0.0301	5.45	0.0301
6	PCB 136	13.42	13.4174	6.22	5.79	3.60	3.4001	6.57	0.2242	4.78	0.2242
6	PCB 137	ND	0.0000	6.83	6.17	3.98	0.0000	7.19	0.0000	0.00	0.0000
6	PCBs 138+160	28.18	28.1776	6.80	6.07	3.88	3.7474	7.16	0.0966	5.47	0.0966
6	PCBs 139+149	53.02	53.0204	6.67	5.95	3.75	9.4029	7.02	0.3637	5.16	0.3637

: Congener Calculations MIT

Porewater Station PW004

			Concentration		log Kow	log Koc
f_{TOC}=	0.64%	RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
f_{OC}=	0.39%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.25%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimate

Sum Total Sediment PCB Congeners OC Porewater Calc.	35.20	ng/L
Congener OC Porewater Calc.	838.07	ng/L
Congener OC+BC Porewater Calc.	151.22	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
6	PCB 140	ND	0.0000	6.67	5.95	3.76	0.0000	7.02	0.0000	0.00	0.0000
6	PCB 141	12.84	12.8421	6.82	6.12	3.93	1.5221	7.18	0.0296	5.64	0.0296
6	PCB 142	2.63	2.6299	6.51	6.00	3.81	0.4109	6.86	0.0086	5.48	0.0086
6	PCB 144	3.25	3.2537	6.67	5.90	3.71	0.6400	7.02	0.0069	5.67	0.0069
6	PCB 145	ND	0.0000	6.25	5.76	3.57	0.0000	6.60	0.0000	0.00	0.0000
6	PCBs 161+146	16.70	16.7000	6.99	6.04	3.85	2.3798	7.34	0.0250	5.83	0.0250
6	PCB 147	104.19	104.1923	6.64	5.92	3.73	19.5729	6.99	1.0418	5.00	1.0418
6	PCB 150	ND	0.0000	6.32	5.69	3.50	0.0000	6.67	0.0000	0.00	0.0000
6	PCB 151	1.60	1.6019	6.64	5.88	3.69	0.3300	6.99	0.0028	5.76	0.0028
6	PCB 152	58.19	58.1855	6.22	5.73	3.54	16.9291	6.57	1.7609	4.52	1.7609
6	PCBs 153+132	4.81	4.8092	6.75	6.06	3.87	0.6545	7.10	0.0092	5.72	0.0092
6	PCB 154	ND	0.0000	6.76	5.83	3.64	0.0000	7.12	0.0000	0.00	0.0000
6	PCB 155	3.07	3.0679	6.41	5.59	3.40	1.2321	6.76	0.0151	5.31	0.0151
6	PCB 156	ND	0.0000	6.41	5.59	3.40	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 157	4.35	4.3498	6.41	5.59	3.40	1.7470	6.76	0.0249	5.24	0.0249
6	PCB 158	ND	0.0000	6.41	5.59	3.40	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 159	ND	0.0000	6.41	5.59	3.40	0.0000	6.76	0.0000	0.00	0.0000
6	PCB 162	ND	0.0000	7.24	6.00	3.81	0.0000	7.60	0.0000	0.00	0.0000
6	PCBs 163+164	24.21	24.2122	7.01	6.19	4.00	2.4426	7.36	0.0395	5.79	0.0395
6	PCB 166	ND	0.0000	6.93	6.25	4.06	0.0000	7.29	0.0000	0.00	0.0000
6	PCB 167	1.70	1.6955	6.93	6.25	4.06	0.1490	7.29	0.0011	6.17	0.0011
6	PCB 168	11.72	11.7179	6.93	6.25	4.06	1.0296	7.29	0.0180	5.81	0.0180
6	PCB 169	ND	0.0000	6.93	6.25	4.06	0.0000	7.29	0.0000	0.00	0.0000
7	PCBs 170+190	16.84	16.8409	7.37	6.66	4.47	0.5757	7.73	0.0071	6.38	0.0071
7	PCB 171	7.16	7.1602	7.11	6.43	4.24	0.4157	7.47	0.0049	6.16	0.0049
7	PCBs 172+192	4.99	4.9893	7.43	6.50	4.30	0.2494	7.79	0.0010	6.69	0.0010
7	PCB 173	ND	0.0000	7.02	6.45	4.26	0.0000	7.38	0.0000	0.00	0.0000
7	PCBs 174+181	28.34	28.3392	7.32	6.44	4.25	1.6077	7.68	0.0176	6.21	0.0176
7	PCB 175	4.14	4.1389	7.17	6.27	4.08	0.3473	7.53	0.0018	6.35	0.0018
7	PCB 176	4.01	4.0067	6.76	6.16	3.97	0.4331	7.12	0.0069	5.77	0.0069
7	PCB 177	18.30	18.2961	7.08	6.41	4.22	1.1122	7.44	0.0206	5.95	0.0206
7	PCB 178	7.06	7.0632	7.08	6.41	4.22	0.4294	7.44	0.0053	6.12	0.0053
7	PCB 179	14.26	14.2580	7.08	6.41	4.22	0.8667	7.44	0.0144	5.99	0.0144
7	PCBs 180+193	75.32	75.3235	7.44	6.54	4.34	3.4336	7.81	0.0468	6.21	0.0468
7	PCBs 182+187	39.15	39.1477	7.19	6.28	4.09	3.2102	7.55	0.0431	5.96	0.0431

: Congener Calculations MIT

Porewater Station PW004

f_{TOC}=	0.64%	RI Calc Total PCB Congeners	311	µg/kg	6.14	5.68
f_{OC}=	0.39%		From Table 7-1		Aroclor Kow from ATSDR	LOG((10^Kow)*0.35)
f_{BC}=	0.25%				Total PCB Kow LWG Bioaccumulation Model	

Summary Estimate

Sum Total Sediment PCB Congeners OC Porewater Calc.	35.20	ng/L
Congener OC Porewater Calc.	838.07	ng/L
Congener OC+BC Porewater Calc.	151.22	ng/L

Estimated Sediment PCB Mass By Congener				Organic Carbon Model				Black Carbon Model			
# Chlorines			**PCB Concentrations (µg/kg)**	**logKow [1]**	**logKoc (Lw/kg OC)[2]**	**logKd (Lw/kg sed)**	**Cw (ng/L)**	**$logK_{BC}$ ($L^{0.7}$/kg BC)**	**Csed/Kd (ng/L)**	**logKd (L/kg sed)**	**Cw (ng/L)**
7	PCB 183	16.77	16.7703	7.20	6.30	4.11	1.3133	7.56	0.0123	6.14	0.0123
7	PCB 184	ND	0.0000	7.20	6.30	4.11	0.0000	7.56	0.0000	0.00	0.0000
7	PCB 185	ND	0.0000	7.20	6.30	4.11	0.0000	7.56	0.0000	0.00	0.0000
7	PCB 186	ND	0.0000	7.20	6.30	4.11	0.0000	7.56	0.0000	0.00	0.0000
7	PCB188	ND	0.0000	6.82	6.02	3.83	0.0000	7.18	0.0000	0.00	0.0800
7	PCB 189	ND	0.0000	6.82	6.02	3.83	0.0000	7.18	0.0000	0.00	0.0000
7	PCB 191	ND	0.0000	7.55	6.56	4.37	0.0000	7.92	0.0000	0.00	0.0000
8	PCB 194	19.44	19.4360	7.80	6.96	4.77	0.3330	8.17	0.0020	6.98	0.0020
8	PCB 195	10.80	10.7966	7.56	6.86	4.67	0.2329	7.93	0.0020	6.74	0.0020
8	PCBs 196+203	21.76	21.7643	7.65	6.73	4.54	0.6332	8.02	0.0040	6.74	0.0040
8	PCB 198	ND	0.0000	7.62	6.69	4.50	0.0000	7.99	0.0000	0.00	0.0000
8	PCB 199	16.02	16.0232	7.20	6.57	4.38	0.6739	7.56	0.0114	6.15	0.0114
8	PCB 200	ND	0.0000	7.27	6.47	4.28	0.0000	7.63	0.0000	0.00	0.0000
8	PCB 201	4.14	4.1404	7.62	6.71	4.52	0.1261	7.99	0.0004	7.00	0.0004
8	PCB 202	ND	0.0000	7.24	6.43	4.24	0.0000	7.60	0.0000	0.00	0.0000
8	PCB 204	ND	0.0000	7.30	6.48	4.29	0.0000	7.66	0.0000	0.00	0.0000
8	PCB 205	ND	0.0000	8.00	6.99	4.80	0.0000	8.37	0.0000	0.00	0.0000
8	PCB 206	5.67	5.6694	8.09	7.13	4.94	0.0657	8.47	0.0001	7.63	0.0001
9	PCB 207	ND	0.0000	7.74	6.90	4.71	0.0000	8.11	0.0000	0.00	0.0000
9	PCB 208	ND	0.0000	7.71	6.86	4.67	0.0000	8.08	0.0000	0.00	0.0000
10	PCB 209	ND	0.0000	8.18	7.27	5.08	0.0000	8.56	0.0000	0.00	0.0000

Notes:

Performance Reference Compounds 1253.74

PRCs not included in porewater calculations

0.00

1. Kow values from Hawker and Connell, 1988
2. Koc values from Hansen et al 1999