

Scope of Work and Budget
High Flow SPMD Sampling in Support of Water Column Trend Assessment
January 4, 2023 Draft

Background

This scope of work addresses the priority activity identified by the Task Force related to water column PCB monitoring to support long term trend assessment. The Task Force authorized long term monitoring of PCBs in the water column in the Spokane River starting in 2020, with the intent of monitoring each of the three seasonal flow regimes (low summer flow, moderate winter flow, and high spring flow) every two years. All three seasonal flow regimes were monitored during the 2020-2021 biennium, and the Task Force previously authorized monitoring of the low summer flow and moderate winter flow regimes of 2022-2023. This project consists of completion of the 2022-2023 water column monitoring program for trend assessment, by conducting monitoring during the high spring flow seasonal flow regime.

Semipermeable membrane devices will be deployed to monitor PCB concentrations at four locations ranging from the WA/ID State Line down to Nine Mile Dam. SPMDs will be deployed for one month during the high spring flow seasonal flow regime. The data collected under this study will be used to characterize annual average Spokane River water column PCB concentrations for the period Summer, 2022 through Spring, 2023, and serve as a reference point for comparison to monitoring data in past and future years.

Scope of Work

Work will be covered via seven tasks:

1. Preparation of QAPP addendum
2. Development of scopes of work
3. Field planning and coordination
4. Field monitoring
5. SPMD data assessment
6. Reporting
7. Data uploading

Task 1: Preparation of QAPP addendum

LimnoTech will prepare a draft quality assurance program plan (QAPP) addendum in accordance with Ecology's "[Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies](#)". A draft QAPP will be submitted to Ecology for review and revised into a final version incorporating all comments.

Task 2: Development of scopes of work

LimnoTech will prepare draft scopes of work detailing contractor responsibilities and budget for use by the Task Force's Administrative and Contracting Entity (ACE) in developing contacts/purchase orders related to this work. Separate scopes and budgets will be developed for:

- Gravity Consultants: Field monitoring
- SGS AXYS: Laboratory analysis for PCBs
- SVL Laboratories: Laboratory analysis for conventional pollutants

- EST Laboratories: Provision of SPMDs
- LimnoTech: Development of QAPP addendum, field monitoring oversight, data validation, SPMD data assessment, reporting, and uploading of data to EIM.

Task 3: Field planning and coordination

Trend Assessment: Gravity Consultants will coordinate with staff from Avista to identify the specific location for placement of the Nine Mile Dam SPMD. Should the location used in prior monitoring not be available, Gravity and LimnoTech will work with Avista to define a new location that is both accessible and representative of Spokane River PCB concentrations.

Task 4: Field Monitoring

Sampling will encompass locations ranging from the WA/ID State Line downstream to Nine Mile Dam. This area is selected because it covers the majority of PCB loading sources from the Spokane area. SPMD samplers for trend assessment will be deployed at the same four locations from the original study:

- WA/ID State Line
- Upriver Dam
- Near Upper Falls
- Nine Mile Dam

Two field SOPs will be followed during the study related to the use of SPMDs:

- Hobbs (2020) — Standard Operating Procedure EAP001, Version 4.1. Standard Operating Procedure for Conducting Studies Using SPMDs.
- Seiders et al. (2020) — Standard Operating Procedure for Semipermeable Membrane Devices (SPMD) Data Management and Data Reduction

In addition to the SPMDs, Gravity Consultants will collect grab samples in accordance with the Standard Operating Procedures listed in LimnoTech (2014):

- Grab samples of TOC/DOC/TSS at the deployment, mid-period, and retrieval of SPMDs at all locations.
- Grab samples of PCBs at the deployment, mid-period, and retrieval of SPMDs at all locations.

Samples will be shipped overnight to SGS AXYS (for analysis of PCBs) and to SVL laboratories (for analysis of total organic carbon, dissolved organic carbon, and total suspended solids). Laboratory results will be blank-censored and validated in accordance with the project QAPP.

Task 5. SPMD data assessment

LimnoTech will calculate congener-specific water column dissolved PCB concentrations from the mass of PCBs in the SPMDs. using the equations developed in Huckins et al (2006) and implemented in the spreadsheet "SPMD Water Concentration Estimator v5-2"

(https://www.usgs.gov/centers/cerc/science/passive-sampling-using-spmuds-and-pocis?qt-science_center_objects=0#qt-science_center_objects). Dissolved PCB concentrations will be converted to total PCB concentrations based on observed TOC and POC concentrations and established partition

coefficients. Total PCB concentrations are being generated solely for informational purposes, as trend assessments are expected to be conducted using only dissolved PCB concentrations.

Observed PCB concentrations from collected field blanks will be processed to estimate both the limit of detection (LOD) and limit of quantitation (LOQ) by congener. The LOD will be calculated as the mean of the field blanks plus three standard deviations while the LOQ was calculated as the mean of the field blanks plus ten standard deviations as originally described by Keith (1991) and subsequently recommended in Ecology Standard Operating Procedures for SPMD data reduction (Seiders and Sandvik, 2020).

Task 6: Reporting

LimnoTech will prepare a project report documenting the conduct and results of this study. The report will present dissolved phase homolog concentrations for all SPMD samples collected, with full congener results provided electronically as an appendix to the report. Annual average PCB concentrations at each of the four stations will be calculated as the arithmetic average of the observed concentrations of the three seasonal exposures, and presented in tabular form compared to results from the same stations from 2020-2021. The report will also provide concentration of total PCBs and homologs for all water column grab samples, with complete congener results being provided electronically as an appendix to the report

Task 7: Data uploading

Individual congener results and all relevant sampling information (e.g., locations, sampling and analytical procedures) from the grab sampling of PCBs will be appropriately formatted and uploaded to Ecology’s Environmental Information Management (EIM) database.

Deliverables and Schedule

The expected deliverables and schedule for delivery are provided in Table 1.

Table 1. Deliverables and Schedule

Deliverable	Start Date	Due date	Lead staff
QAPP			
Draft QAPP Addendum	February, 2023	March, 2023	David Dilks
Final QAPP	April, 2023	April, 2022	David Dilks
Field and laboratory work			
Spring high flow sampling	April, 2023	May, 2023	Shawn Hinz
Laboratory analyses	May, 2023	July, 2023	Sean Campbell
Laboratory data validation	July, 2023	August, 2023	Renn Lambert
Database			
Database entry and review	August, 2023	October, 2023	David Dilks
Data uploaded to EIM	October, 2023	November, 2023	David Dilks
Final report			
Draft report to Task Force	October, 2023	November, 2023	David Dilks
Final report on web	November, 2023	December, 2023	David Dilks

Budget

The total cost for conducting this work is \$94,000. Itemized costs are provided in Table 2.

Table 2. Itemized Budget

Item	Cost
Scopes of Work	\$6,000
Draft QAPP	\$3,000
Final QAPP	\$3,000
Field planning and coordination	\$2,000
SPMD preparation/rental	\$5,000
Field labor	\$21,000
Laboratory analyses	\$35,000
Data validation	\$4,000
SPMD data assessment	\$6,000
Reporting	\$6,000
Data uploading	\$3,000
Total	\$94,000