

Scope of Work and Budget
Mission Reach Sediment/Biofilm Sampling

June 13, 2022 Draft

Background

Monitoring data describing PCB concentrations in the biofilm and bed sediments of Mission Reach are of interest because: 1) they can potentially identify the location(s) where previously unidentified sources of PCBs enter the river, and 2) they represent PCB exposure to the base of the benthic food chain and can be informative in terms of describing bioaccumulation of PCBs in fish. Previous monitoring of PCBs in these media in Mission Reach conducted by Ecology and the Task Force has shown a large degree of spatial variability, with highly elevated concentrations intermixed with lower concentrations. The data are too patchy to provide definitive evidence of the location of unknown sources or the average PCB concentration throughout the reach.

The purpose of this project is to conduct additional 2022 sediment and biofilm monitoring to address the following:

- Provide better spatial resolution regarding where unknown loads may be entering the Mission Reach: The available data indicate areas of localized contamination but are at too coarse of a spatial resolution to be useful in pinpointing the location where PCB sources are entering Mission Reach. Additional sampling at higher spatial resolution will provide better definition of where the unknown sources are entering.
- Investigate significance of metallic objects identified during object detection surveys: The 2021 and 2022 object detection surveys identified multiple metallic objects buried in the Mission Reach riverbed. It is currently unknown whether these objects represent previously unknown sources of PCBs (e.g., drums, transformers, other). Sediment and/or biofilm sampling immediately downstream of each location could provide strong evidence of whether those objects are a source of PCBs to the river.
- Provide a better description of benthic conditions throughout Mission Reach: The limited number of (and high variability in PCB concentration in) the available benthic PCB data makes estimation of average PCB concentrations in Mission Reach sediments highly uncertain. This uncertainty translates into uncertainty in the contribution of sediment PCB contamination to fish tissue contamination, to the extent that future studies examining the importance of sediment vs. water column sources to fish tissue concentrations are of interest.

Scope of Work

Work will be covered via six tasks:

1. Preparation of QAPP addendum
2. Development of scopes of work
3. Field monitoring
4. Data assessment and validation
5. Reporting
6. Data uploading

Task 1: Preparation of QAPP

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](#)" covering project activities. The addendum will serve as an update to the Quality Assurance Project Plan "Measuring PCBs in Biofilm, Sediment, and Invertebrates in the Spokane River: Screening Study" originally prepared by Ecology in 2019. A draft QAPP addendum 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: Performance of sampling activities
- SGS AXYS: Laboratory analysis of PCBs
- SVL Laboratories: Laboratory analysis of sediment total organic carbon and grain size distribution
- LimnoTech: Development of QAPP addendum, field monitoring oversight, data validation, data assessment, reporting, and uploading of data to EIM.

Task 3: Field Monitoring

The scope of work consists of the collection and analysis of 49 benthic PCB samples, with 42 samples from biofilm and eight samples from bedded sediment. Proposed sampling locations are provided in Figure 1 for biofilm and Figure 2 for sediments. The rationale for their selection is provided below.

Geostatistical analyses of historical Mission Reach biofilm PCB concentrations concluded that samples are required at a spatial resolution of 100 to 125 feet apart in the direction of flow in order to allow accurate interpolation of concentrations in un-sampled areas and potential location of a source (LimnoTech, 2020). Prior discussion at the Technical Track Work Group (TTWG) concluded that sampling at this level of resolution throughout the entire Mission Reach was infeasible, and that the higher spatial resolution should be confined to locations where elevated concentrations had been observed in the past. Consistent with the direction from the TTWG to collect approximately 50 benthic samples in total, the biofilm sampling locations depicted in Figure 1 correspond to seven sampling locations associated with each of the highest observed biofilm PCB concentration in 2018 and 2019. The seven samples correspond to one sample at the location of the historical measurement in conjunction with three samples each in the upstream/downstream direction spaced 100 feet apart.

Sediment sampling locations are proposed corresponding to areas where elevated sediment PCB concentrations were observed in the past or areas indicated by the object detection surveys to contain subsurface metallic objects (Figure 2),

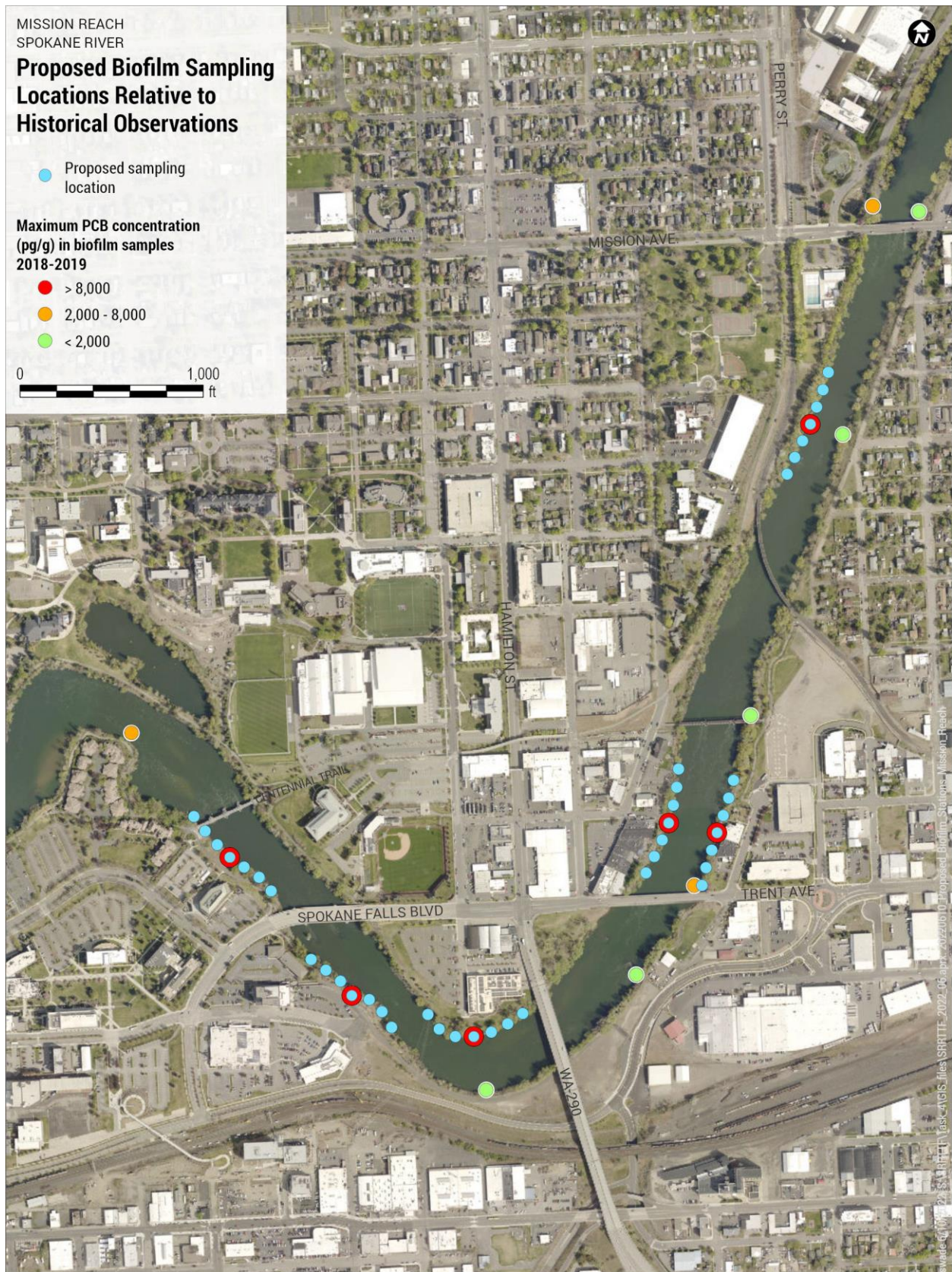




Figure 2. Proposed Sediment Sampling Locations

Prior to sampling, Gravity Consultants will conduct field reconnaissance in terms of assessing the feasibility of collecting biofilm and/or sediment samples at each site. Specific locations of monitoring sites may be adjusted to ensure that samples can be collected.

Biofilm sampling will be conducted in a manner consistent with that performed by Ecology (Wong and Era-Miller, 2019) in their 2018 and 2019 biofilm monitoring. Sediment sampling will be conducted following the same procedures (Gravity, 2018) used during the sediment sampling conducted by the Task Force in 2021.

Samples will be shipped overnight to SGS AXYS for analysis of PCBs and to SVL Laboratories for analysis of sediment total organic carbon and grain size distribution. Laboratory results will be validated in accordance with the project QAPP.

Task 4. Data assessment and validation

Laboratory results will be blank-censored and validated in accordance with the project QAPP. Observed concentrations will be assessed in terms of:

- Comparison to other recently collected benthic PCB data from Mission Reach
- Whether the spatial distribution of observed concentrations provides sufficient evidence to identify the location of a previously un-monitored source of PCBs to the Mission Reach

Task 5: Reporting

LimnoTech will prepare a project report providing total PCB and homolog concentrations for all samples collected along with a discussion of the results from the Task 4 assessment. Full congener results will be provided electronically as an appendix to the report.

Task 6: Data uploading

Individual congener results and all relevant sampling information (e.g., locations, sampling and analytical procedures) 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	Completion Date
Draft QAPP	June 29, 2022
Final QAPP	July 29, 2022
Samples collected	September 30, 2022
Laboratory results	November 15, 2022
Draft technical report	December 30, 2022
Final technical report	February 21, 2023
Data loaded to Ecology's EIM	March 15, 2023

Budget

The cost for conducting this work is \$156,000, as detailed in Table 2.

Table 2. Itemized Budget

Item	Budget
Scopes of Work	\$5000
Draft QAPP	\$3000
Final QAPP	\$3000
Field labor and coordination	\$40,000
Laboratory analyses	\$66,000
Data validation and assessment	\$9,000
Reporting	\$12,000
Data uploading	\$8,000
Project management	\$10,000
Total	\$156,000

References

Gravity Consultants, 2018. Standard Operating Procedure (SOP) SW-19 - Surface Sediment Sampling with Grab Sampler.

LimnoTech, 2020. Follow-up Investigations from Spokane River Multi-media Data Collection. Prepared for Spokane River Regional Toxics Task Force. August, 2020.

Wong, S. and B. Era-Miller, 2019. Quality Assurance Project Plan: Measuring PCBs in Biofilm, Sediment, and Invertebrates in the Spokane River: Screening Study. Publication 19-03-103. Washington State Department of Ecology, Olympia.

<https://fortress.wa.gov/ecy/publications/SummaryPages/1903103.html>