

**Draft Scope of Work**  
**Initial Data Mining to Assess Bioaccumulation of PCBs in Spokane River Fish**

Many Task Force discussions have occurred related to the fact observed PCB concentrations in the Spokane River were generally compliant with the previous water column water quality standard, while observed fish tissue concentrations were well above target levels protective of human consumption. Several potential explanation have been offered for this discrepancy, including:

- Fish are obtaining PCBs from some sediment hot spot(s), representing either historical contamination that has not been completely remediated or some other undefined sediment source.
- A currently un-defined sediment source is contributing to fish tissue contamination, as fish show elevated concentrations of certain congeners that have been measured at levels of zero (i.e. concentrations less than associated lab blanks) at times in the water column.
- Several older fish were collected as part of the 2012 fish tissue PCB monitoring; these older fish may reflect historical PCB concentrations in the Spokane River rather than current conditions.

As the Task Force considers future Spokane River monitoring, it will be helpful to mine the existing data to assess the validity of the above concerns to help guide monitoring efforts. Specifically, the validity of the above concerns will be evaluated by testing an alternate hypothesis, i.e.

- Spokane River fish tissue concentration are at a level generally consistent with observed water column concentrations, if site-specific bioavailability and bioaccumulation is considered.

This hypothesis will be tested through the following steps:

1. Calculate the concentrations of PCBs in Spokane River sediments that would be expected to occur given currently observed water column concentrations, due to settling of particle-bound PCBs from the water column. This will be accomplished by:
  - Reviewing available water column PCB, suspended solids and organic carbon concentrations
  - Obtaining homolog-specific PCB partition coefficients from the scientific literature
  - Merging the above information to calculate mass of PCB per mass of solids in the water column
  - Translating the solids-bound water column PCB concentrations into bed sediment PCB concentrations.
2. Calculate homolog-specific bioaccumulation factors, using an updated version of the simple bioaccumulation model originally applied by Dave Serdar for Ecology's 2011 Spokane River PCB Source Assessment Study. Model results will be summed across homologs to calculate expected fish tissue concentrations in the Spokane River that would result solely from present-day water column concentrations (and the sediment contamination that results from existing water column concentrations).
3. Calculate average blank-corrected congener concentrations (for those congeners observed in fish tissue but absent from some water column samples) for all recent water column data collected at Trent Avenue/Plante's Ferry. Merge this information with the bioaccumulation factors calculated in Step 2 and compare predicted congener-specific fish tissue concentrations to concentrations observed in 2012.

4. Review literature-based estimates of the rate at which fish eliminate PCBs from their tissues (i.e. the depuration rate), to assess the validity of the hypothesis that PCB concentrations in older fish are reflective of historical PCB levels in the Spokane River.

Deliverables:

- Presentation of findings at a Task Force or TTWG meeting, addressing the following issues:
  - The level of PCBs expected in Spokane River fish, given observed water column concentrations
  - Whether observed congener concentrations in Plante's Ferry fish are consistent with observed water column concentrations
  - The time period of river concentration reflected in the fish tissue of older fish.
- Assessment of key data gaps, to help guide upcoming Task Force and EAP monitoring.
- Copies of all calculation spreadsheets.

Cost: \$2000

Schedule: One month from notice to proceed.