Monitoring to Assist in Defining the Sources of PCB Contamination in the Mission Reach

TTWG Meeting

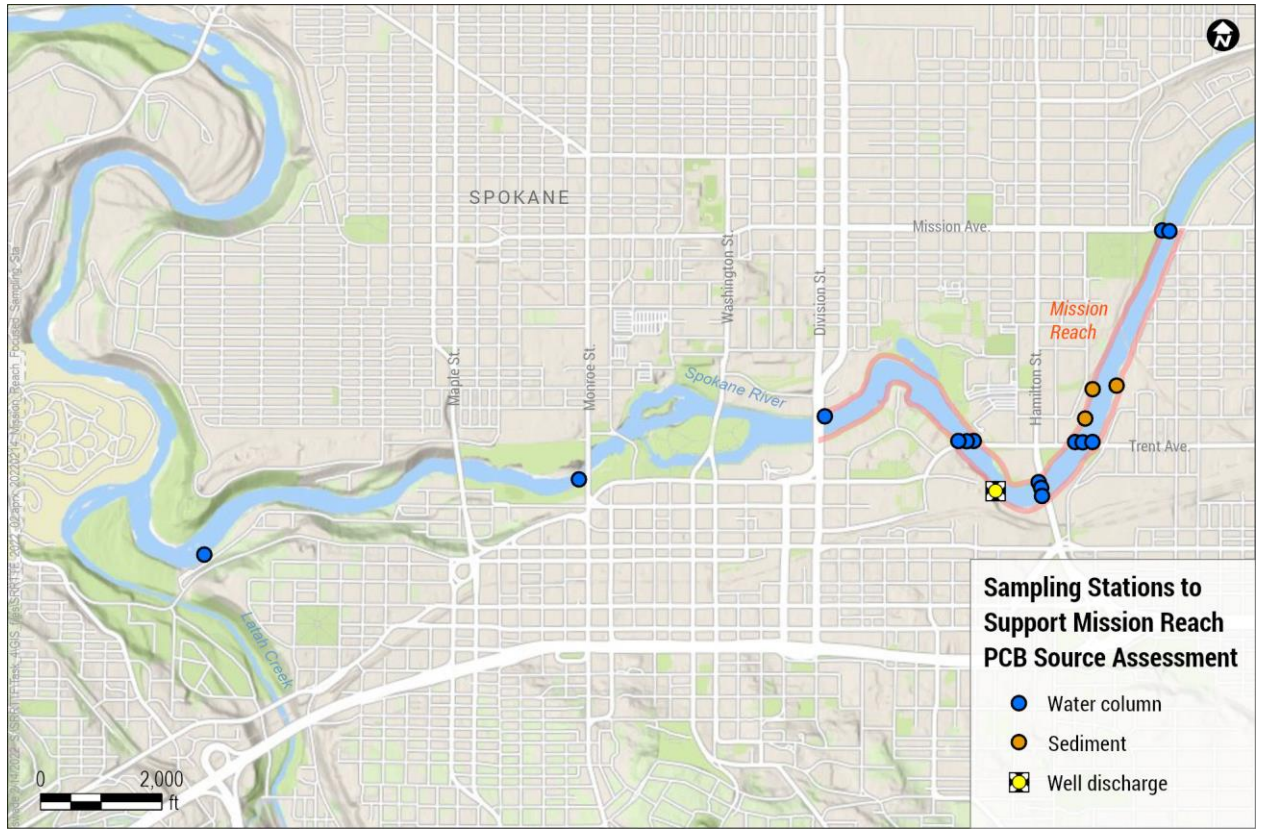
March 16, 2022

Background

- PCB concentrations in Mission Reach are higher than elsewhere in the river
  - Suggests presence of unidentified source
- Diagnostic monitoring was conducted in 2021 to aid in source identification
  - Water and sediment monitoring
  - PCB-detection dog
  - Sub-bottom object detection
  - Drive-point piezometer feasibility assessment

Water and Sediment Monitoring

- Three separate components, each with different objectives
  - Water column: Define the spatial distribution of PCB concentrations
  - Artesian well discharge: Provide an indication of the potential significance of contaminated groundwater
  - Bed sediments: Supplement the single Mission Reach sediment sample collected in 2018



Water Results: Total PCBs

- Spokane River
  - Concentrations generally range between 150 and 320 pg/l
  - No obvious spatial pattern indicating presence of a PCB source
  - Elevated concentration observed at E. Mission Ave. (574 pg/l)
    - Source (if any) upstream of Mission Reach
- Artesian Well
  - PCB concentration = 2100 pg/l

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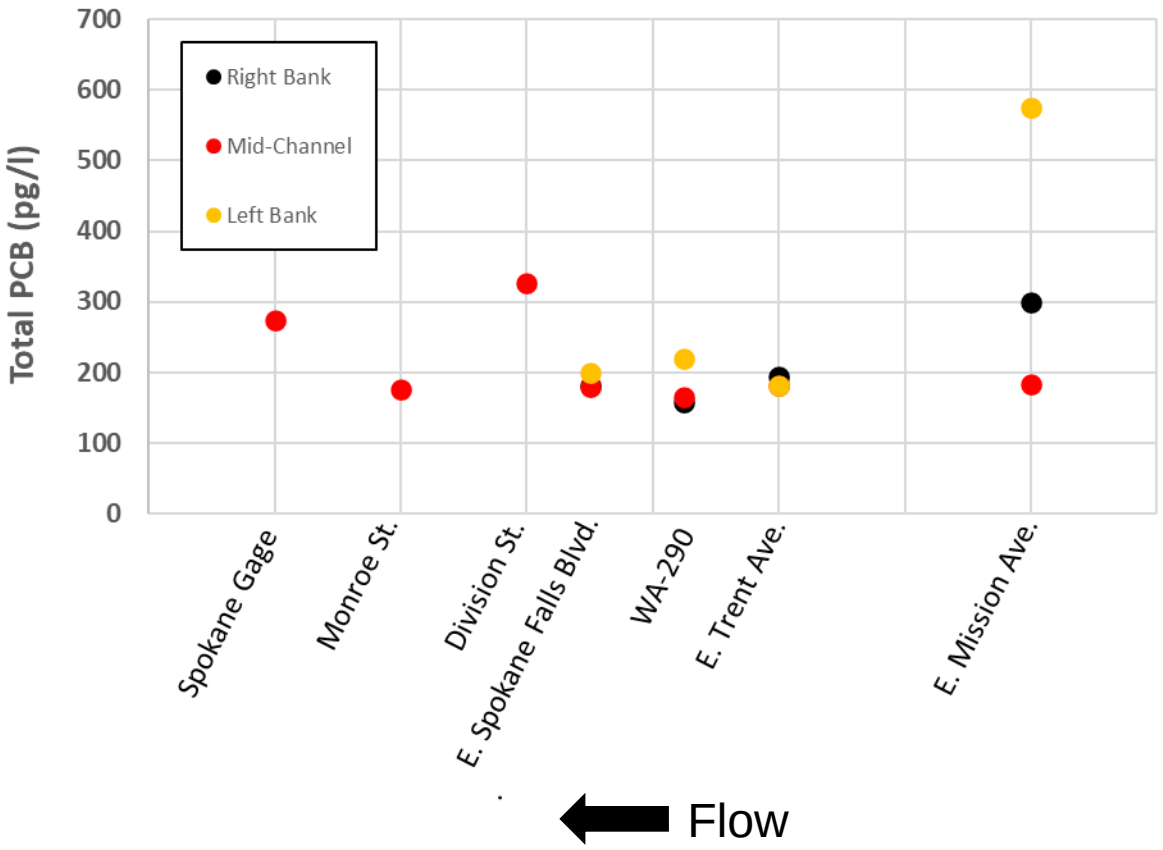
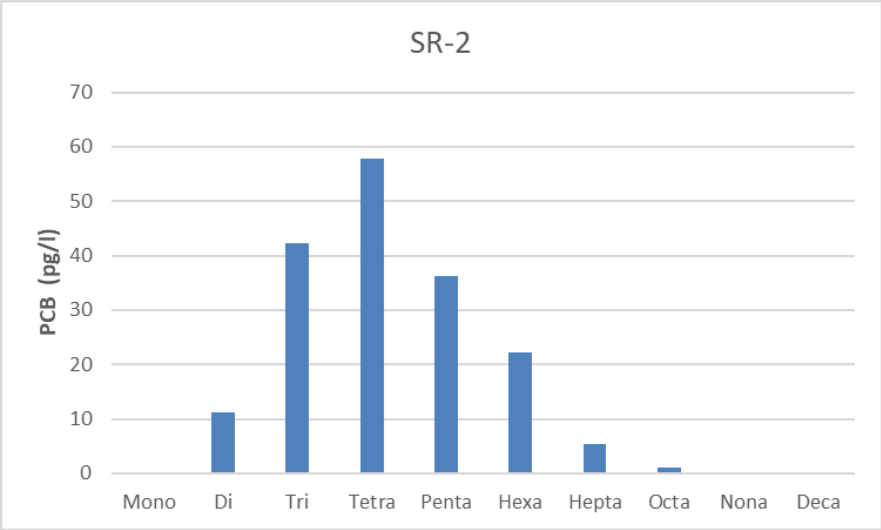


Water Results: Homolog Distributions

- Spokane River
  - Tetra- most prevalent, followed by tri- and penta-chloro homologs
  - Potentially indicative of a mixture of Aroclor 1242 and 1254



- Artesian Well
  - Dominated by tri and tetra-chloro homologs
  - Very similar to Aroclor 1242

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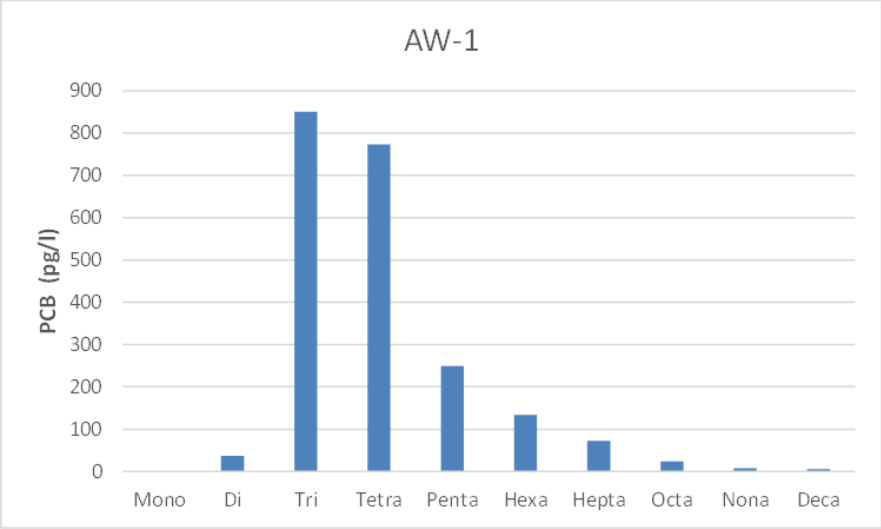
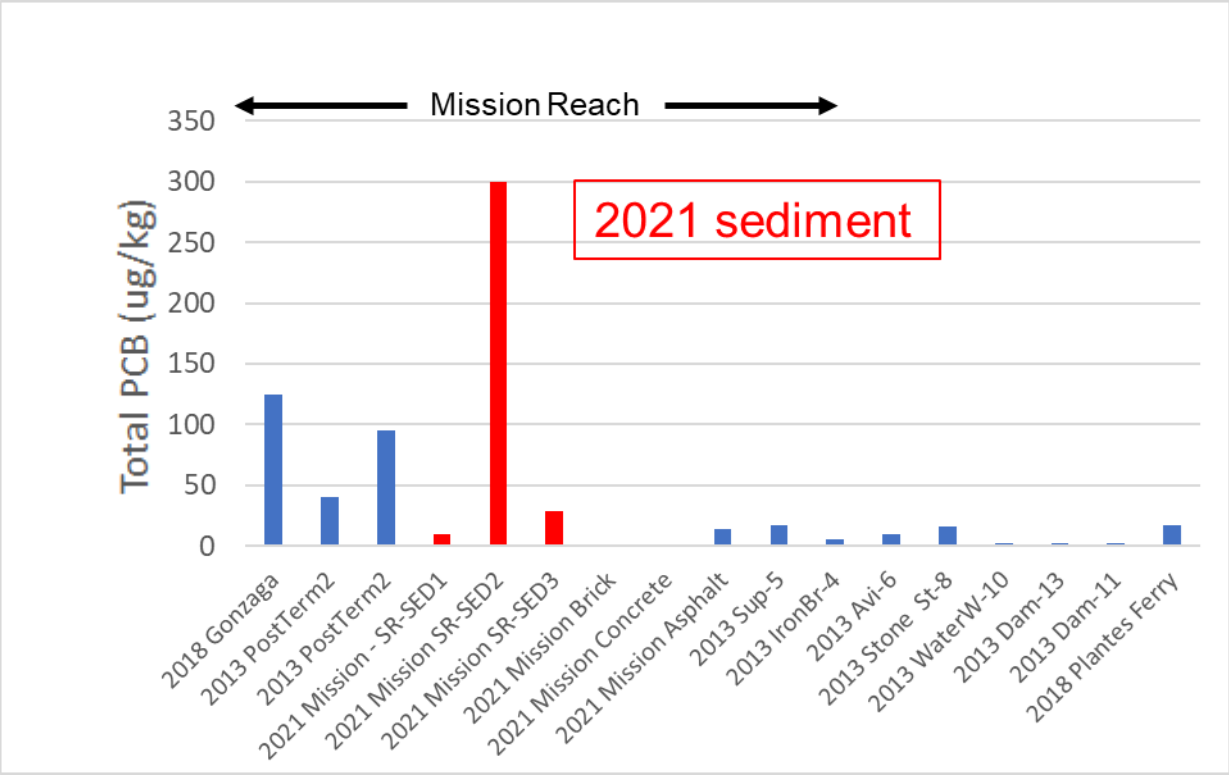


Sediment Results: Total PCBs

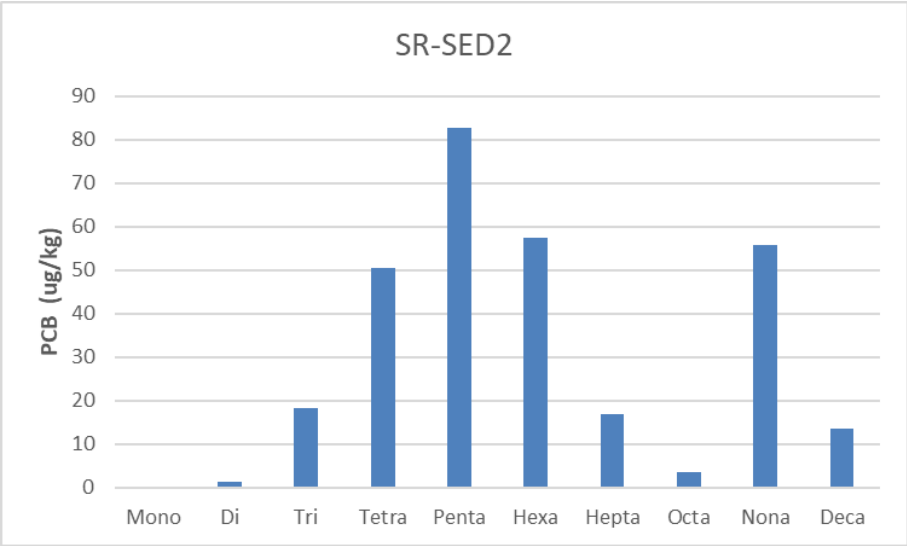
- Consistent with historically observed patterns
  - One elevated (300 ug/kg) concentrations
  - Two concentration similar to those seen outside of Mission Reach

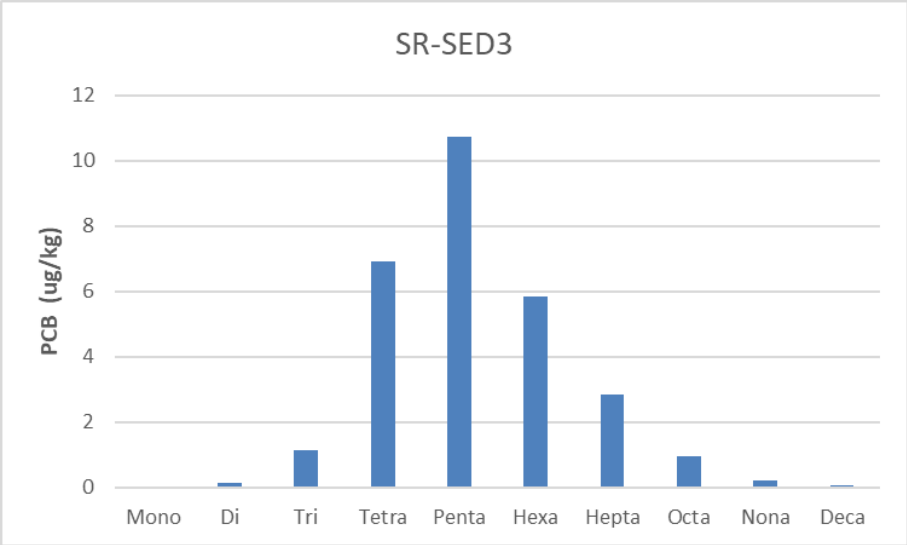


Flow

Sediment Results: Homolog Distributions

- Elevated sample
  - Penta- most prevalent, followed by hexa- nona- and tetra-
  - Does nona- signal represent an inadvertent source?
- Other samples
  - Penta- most prevalent, followed by tetra- and hexa-



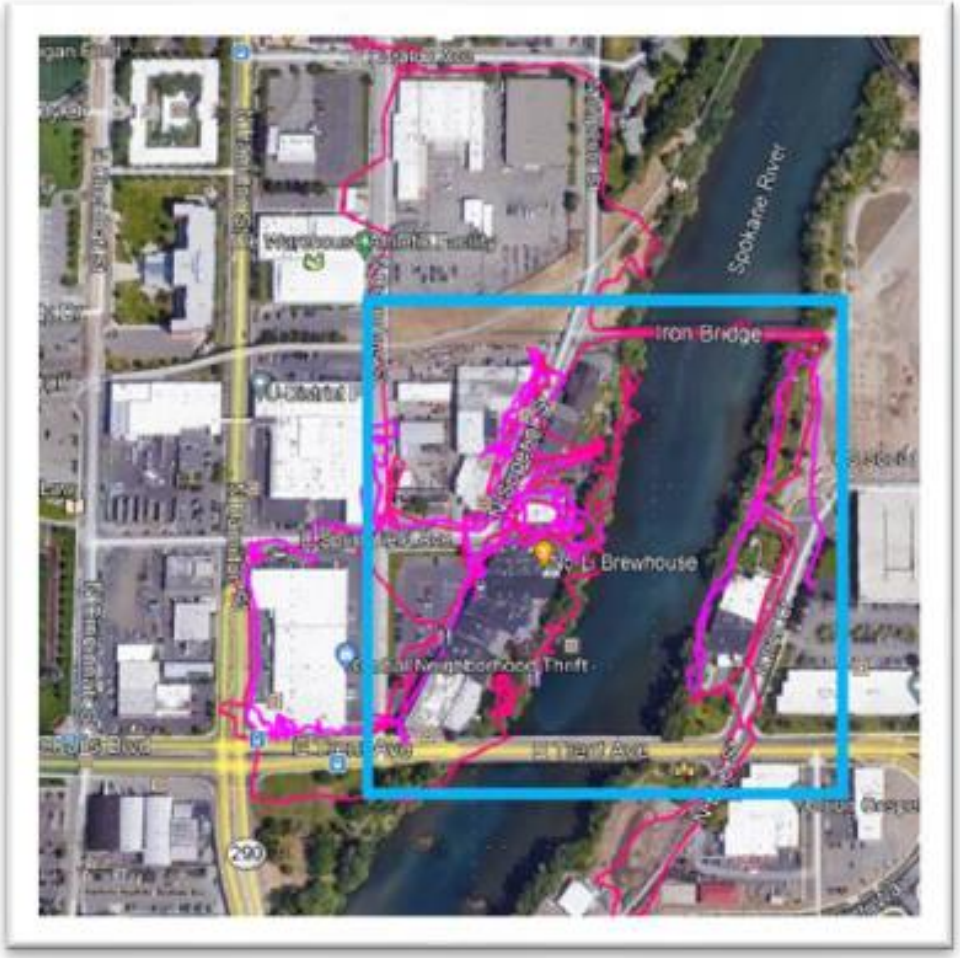


Water and Sediment Survey: Findings and Next Steps

- Artesian well sample suggests presence of groundwater contamination
  - Additional well sampling to confirm elevated concentrations
  - Deeper dive into groundwater hydrology to better understand when/where groundwater enters Mission Reach
- Sediment sampling confirms presence of patchy contamination
  - Additional monitoring to be recommended after follow-up object detection survey
- River samples did not indicate presence of unknown source in Mission Reach

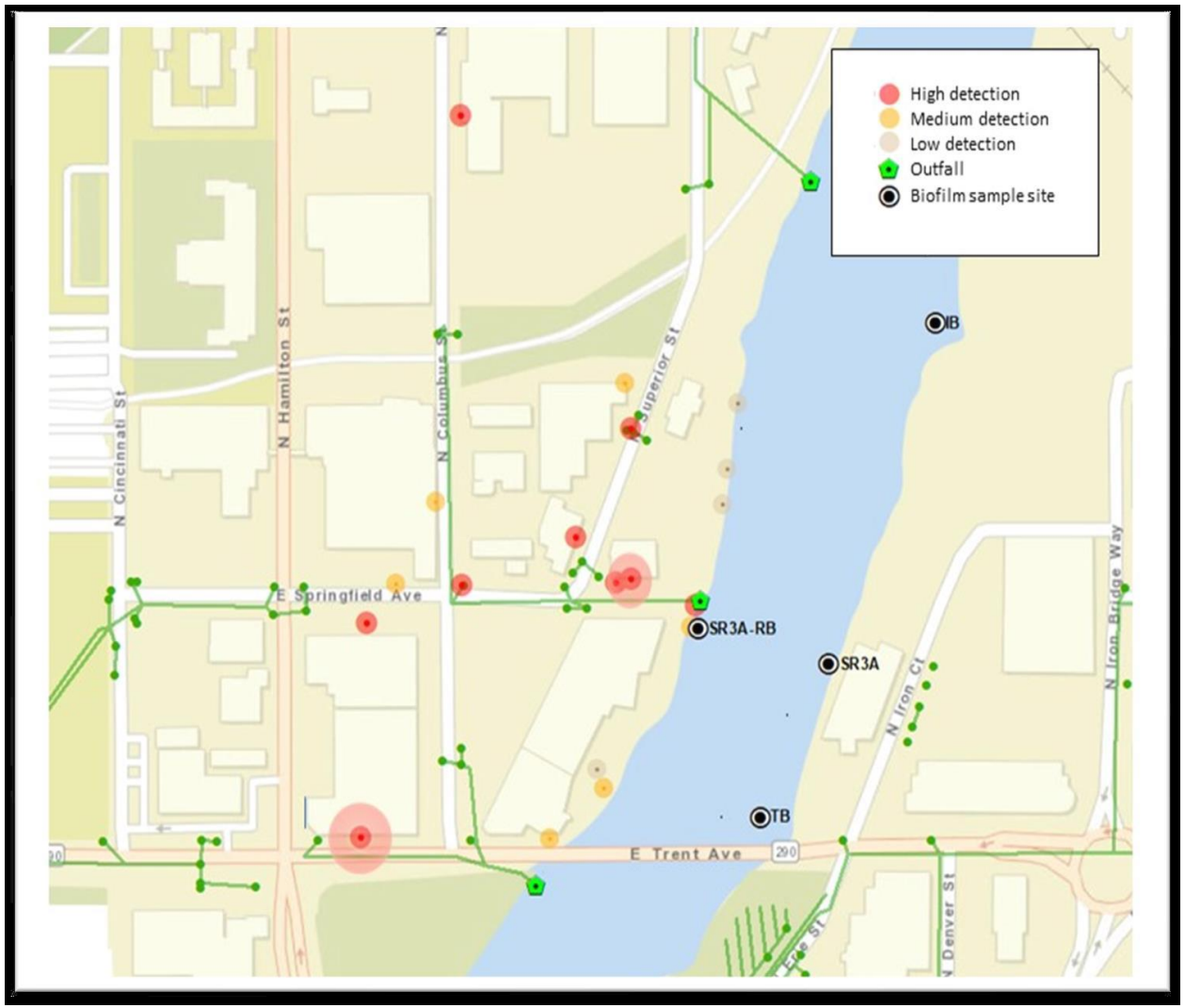
PCB-Detection Dog

- Trained PCB-detecting dog deployed to identify potential areas of PCB contamination in riparian areas of the Mission Reach
  - Location targeted to where the highest PCB concentrations were observed in biofilm



PCB-Detection Dog: Findings and Next Steps

- No definitive sources of PCBs detected along either riverbank
- Detections were observed at:
  - several buildings in the stormwater drainage area
  - stormwater catch basin sites
  - Drywell sites
- Sampling to be recommended at catch basins
  - Follow-up monitoring contingent upon those results

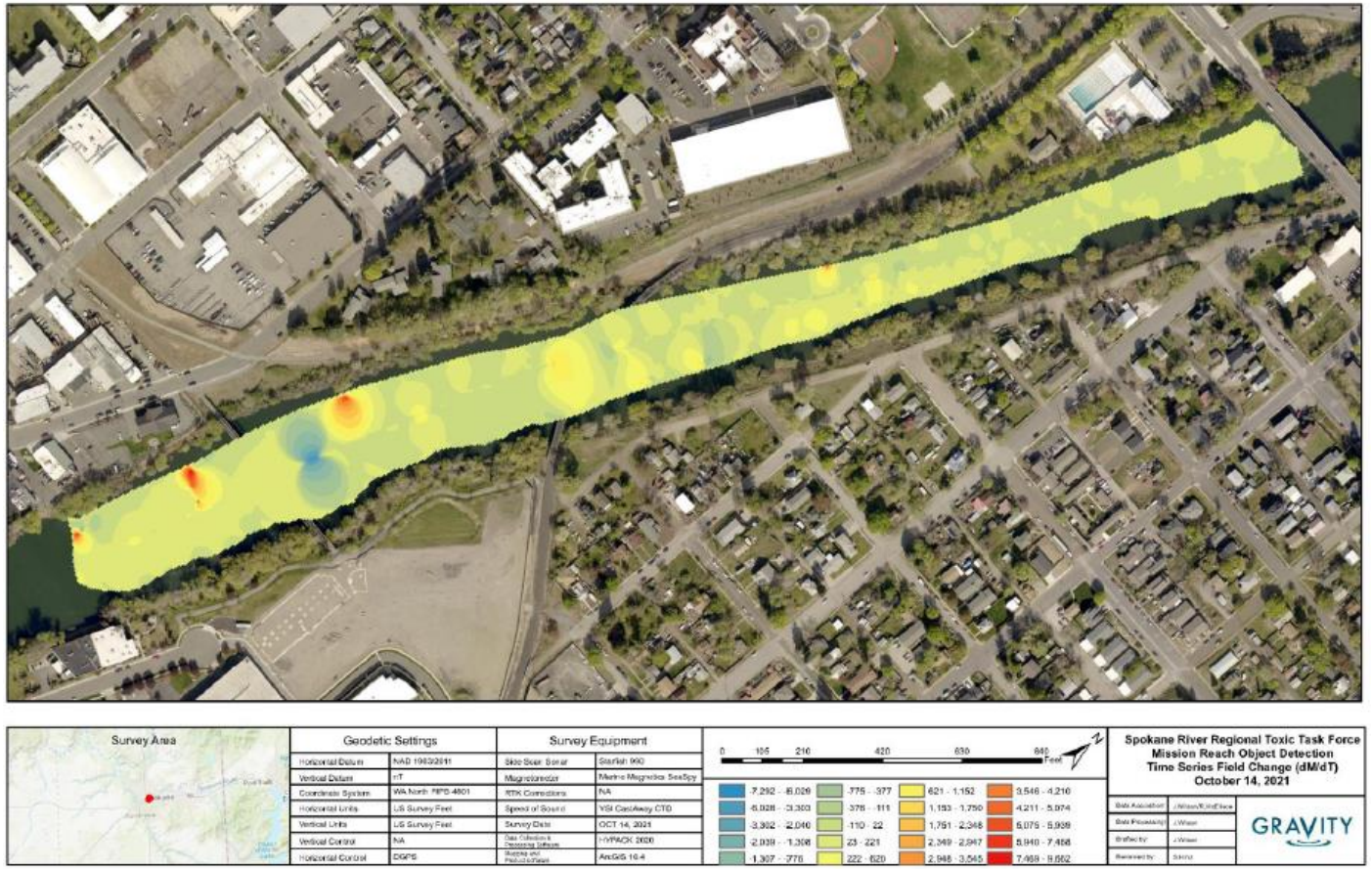


Object Detection Survey

- Remote sensing technologies deployed to identify potential PCB-containing objects in the riverbed
  - Side scan sonar
    - Physical objects
  - Magnetometer
    - Metallic objects

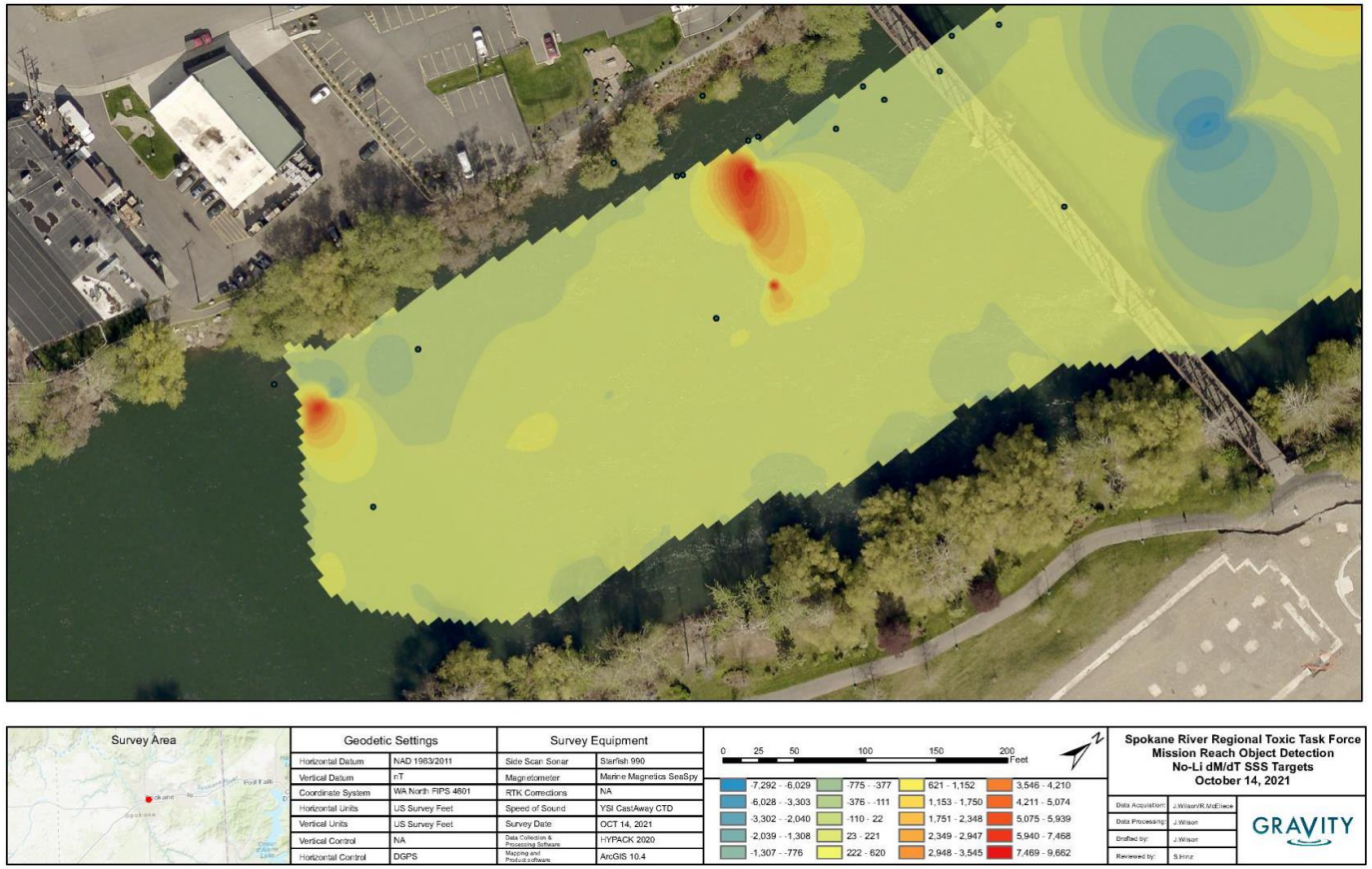
Object Detection Results

- Entire Mission Reach could not be surveyed due to construction at Trent Ave. Bridge
- Areas of contamination identified in lower portion of surveyed area



Object Detection Results

- Three metallic objects identified in downstream portion of surveyed area



Object Detection: Next Steps

- Extend object detection survey to cover unmonitored portion of the Mission Reach
- Recommend targeted sediment/biofilm sampling on entire Mission Reach after object detection survey is complete

Drive-Point Piezometer Feasibility Assessment

- Groundwater interaction is of concern in the Mission Reach
- Temporary drive-point piezometers are being considered for use in groundwater quality monitoring as part of the dissolved oxygen TMDL
- Feasibility assessment conducted to determine whether they could be used in Mission Reach
  - Can they be installed?
  - Can we measure water quality in the transition zone between river and aquifer?

Piezometer Feasibility Assessment: Findings and Next Steps

- Piezometers were successfully installed at two out of three locations attempted in the Mission Reach
  - Conductivity in the transition zone higher than that measured in the river
- Next steps
  - No further action planned until ongoing studies assessing groundwater interaction in Mission Reach are completed