

# **Spokane River Toxics Task Force Technical Track Work Group**

**April 20, 2022 Meeting**



# Initial Historical Review Background

- Review of historical land uses is desired as one means to identify potential PCB sources
  - Detailed review is planned for later this year
- Prior to embarking on detailed review, look at three documents
  - 1993-94 Investigation of PCBs in the Spokane River
  - Spokane River PCB and Source Survey, August 2000
  - Spokane River PCB Source Assessment, 2003-2007

# Initial Historical Review

## Findings

- Elevated PCB concentrations were found along riverbank near former Inland Metals site
- Elevated PCB concentrations were found in the oxidation ditch of Spokane Industrial Park's WWTP
  - The WWTP facility has since been removed and the site remediated
  - Indicates presence of PCB use in the Spokane Industrial Park
- Mass balance analysis conducted on 2003-2007 data suggests potential presence of unknown loads entering the river

# Initial Historical Review

## Comments/Responses

- Add summary of Conclusions/Next Steps
  - Done
- Add caveat that the data reviewed are old and predate cleanup actions
  - Done
- Remove text on Pentzer WWTP to prevent confusion because site has been remediated
  - Text edited to make two points clearer
    1. “(T)he WWTP site is not considered an ongoing source of PCBs to the river”
    2. Our interest is in those industries served by the WWTP. Sludge data indicate presence of historical PCB use by WWTP users, and potential for groundwater contamination from them

# Initial Historical Review

## Comments/Responses

- Provide information on Aroclor distribution at Industrial Park
  - Moved from footnote to body of text
- Remove Ecology (2011) loading pyramid, because:
  - 1) the data are highly variable
  - 2) the original report did not claim the presence of unknown loads,
  - 3) data evaluated were collected prior to cleanup actions and have been superseded with more recent and accurate data
  - Added text noting variability of data
  - Added text that the “unknown load” determination came after original report
  - Recommended repeating the analysis using recent SPMD data

# Mission Reach Source Assessment

## Background

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

# Mission Reach Source Assessment Findings

- Water column monitoring did not indicate presence of new PCB source
- “Artesian well” sample suggests presence of contamination (2100 pg/l)
  - Additional monitoring planned
- Object detection survey identified numerous buried metallic objects
  - Follow-up survey approved to extend study area below Trent Avenue
- Sediment sampling confirms presence of patchy contamination
  - Additional monitoring recommended after follow-up object detection survey
- PCB-detection dog identified areas of potential contamination
  - Catch basin monitoring recommended

# Mission Reach Source Assessment

## Comments/Responses

- Fix typographical errors on reported units
  - Done
- Add cosine similarity calculation between the artesian well homologs and Aroclor 1242 and Aroclor 1016
  - Done
- Elevated sediment sample
  - Mention likely presence of Aroclor 1268
    - Done
  - Note that concentration is more than double any recent measurements
    - Done



# **Mission Reach Source Assessment**

## **Comments To Be Incorporated in Future Studies**

- Compare changes in upstream/downstream homolog distributions
  - Will be done under upcoming mass balance assessment
- Examine groundwater monitoring well elevation to assess potential for groundwater flow into Mission Reach
  - Will be done under upcoming groundwater “deeper dive”

# Trend Assessment

- Task Force must make measurable progress toward meeting applicable water quality criteria for PCBs
  - Demonstration of progress requires a long-term monitoring program
- Task Force began long-term monitoring program in 2020
  - PCBs in redband trout in six reaches
    - One sampling event every two years
  - Water column PCBs as measured by semi-permeable membrane devices
    - Three seasonal deployments every two years
- Next round of sampling due to start this summer
  - Decisions required regarding whether to modify the sampling program

# Trend Assessment of Fish Tissue PCB

- 2020 Design
  - Intention: Year old redband trout in six reaches
  - Actual: No suitable fish available at State Line reach



# Options for 2022 Fish Sample Design

## Decision Required

- Forego collection at State Line
  - Reasons for:
    - PCB concentrations are already low, not expecting to find a trend in tissue concentration
    - Will get some data from Ecology's decadal sampling of whitefish
  - Reasons against:
    - Whitefish are longer lived, tissue PCB data can reflect historical exposure
- Sample other species (smallmouth bass, or mixture of bass and trout)
  - Reasons for:
    - Will provide data every two years
  - Reasons against:
    - Smallmouth bass bioaccumulate less, will have less of an environmental signal
    - PCB results from a mixture of species will be difficult to interpret

# Trend Assessment of Water Column PCBs

- Used semi-permeable membrane devices (SPMDs)
  - Passive sampler deployed in field for ~28 days
  - Provides integrated estimate of dissolved phase water column PCB concentration
- Problems identified with SPMDs
  - PCB concentrations are estimates based on a model
    - Ecology does not consider these direct measurement
  - Provides estimate only of dissolved phase concentration
    - Translation to total PCB concentrations adds additional uncertainty
  - Quality control results were marginally satisfactory
    - Most concentration values were flagged as estimates



Pictures from Ecology (2019)  
SOP

# Alternatives to SPMDs

- Water column grab samples
  - Method currently in use
  - Imprecise due to blank contamination, problem will get worse as concentrations decrease in the future
- In situ solid phase extraction (CLAM)
  - Submersible device that extracts water through a solid phase extraction disk
  - Highly regarded in Ecology review of low-level sampling methods
- Portable high-volume centrifuge
  - Recently developed methodology from USGS
  - Promising, but short track record and indirect estimate of total PCB concentration



# Options for Upcoming Year

## Decision Required

- Recommend maintaining SPMDs, but consider supplemental analyses
- Options
  - Use solely SPMDs and evaluate dissolved phase water column PCB concentration only
  - Supplement SPMDs with additional grab samples
  - Supplement SPMDs with CLAM sampling
  - Supplement SPMDs with portable high-volume centrifuge

# Rough Scopes and Budgets for Priority Projects

- Data synthesis workshop identified several projects for consideration
- Staged plan for approval
  1. Develop scopes and rough budgets for interim approval by TTWG and Task Force
    - Needed in short term to incorporate funding in the Ecology contract
  2. Develop scopes and final budgets for the projects receiving interim approval
    - Subsequent review by TTWG and Task Force prior to final approval
- Priority projects
  - Expanded synoptic survey
  - Springfield stormwater catch basin sampling
  - Artesian well sampling
  - Next level historical review
  - Mission Reach sediment/biofilm sampling
  - Additional sampling at Mirabeau
  - Expanded object detection survey

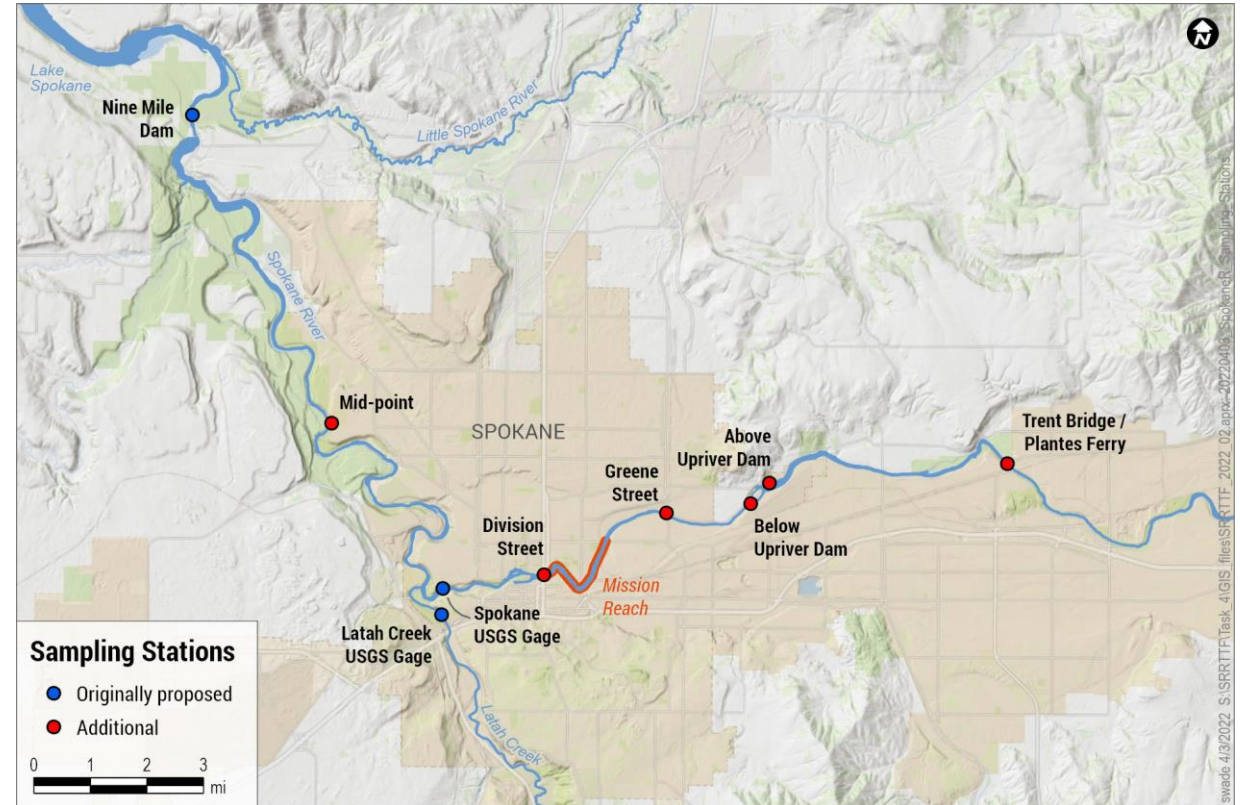


# Expanded Synoptic Survey

- Background/Purpose
  - Task Force has already approved synoptic survey from USGS gage to Nine Mile Dam
  - Much information could be gained by expanding spatial scope
    - Better detail on where loads enter downstream of USGS gage
    - Loading assessment for Mission Reach
    - Understanding of homolog shift downstream of Plantes Ferry
- Scope
  - Expand number of river stations
  - Conduct homolog-specific mass balance on all seven reaches

# Expanded Synoptic Survey

- Purpose of additional stations
  - Mid point between USGS Gage and Nine Mile Dam
    - Better detail on where loads enter
  - Green Street and Division Street
    - Loading assessment for Mission Reach
  - Plantes Ferry, Above and Below Upriver Dam
    - Understanding of homolog shift downstream of Plantes Ferry



# Expanded Synoptic Survey

## Decision Required

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collection	August 31, 2022
Laboratory results	October 31, 2022
Draft technical report	December 16, 2022
Final technical report	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

- Budget
  - \$80,000 beyond original authorization of \$80,000

Item	Budget
Scopes of Work	\$4000
Draft QAPP	\$3000
Final QAPP	\$3000
Field planning and coordination	\$8000
Field labor	\$45,000
Laboratory analyses	\$65,000
Data validation	\$8000
Mass balance assessment	\$12,000
Reporting	\$8000
Data uploading	\$6000
<b>Total</b>	<b>\$160,000</b>
<b>Existing Authorization</b>	<b>\$80,000</b>
<b>Net Budget Request</b>	<b>\$80,000</b>

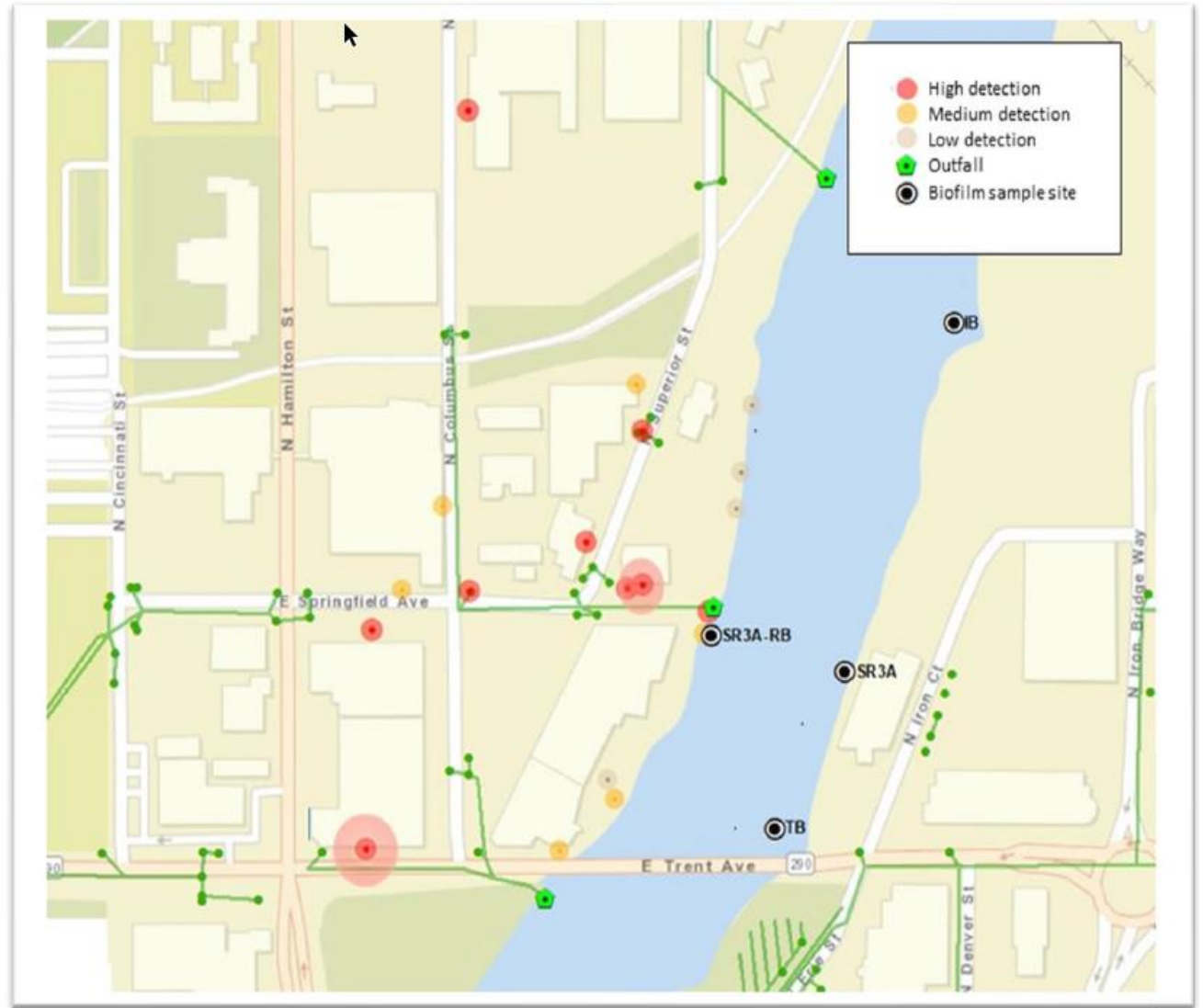
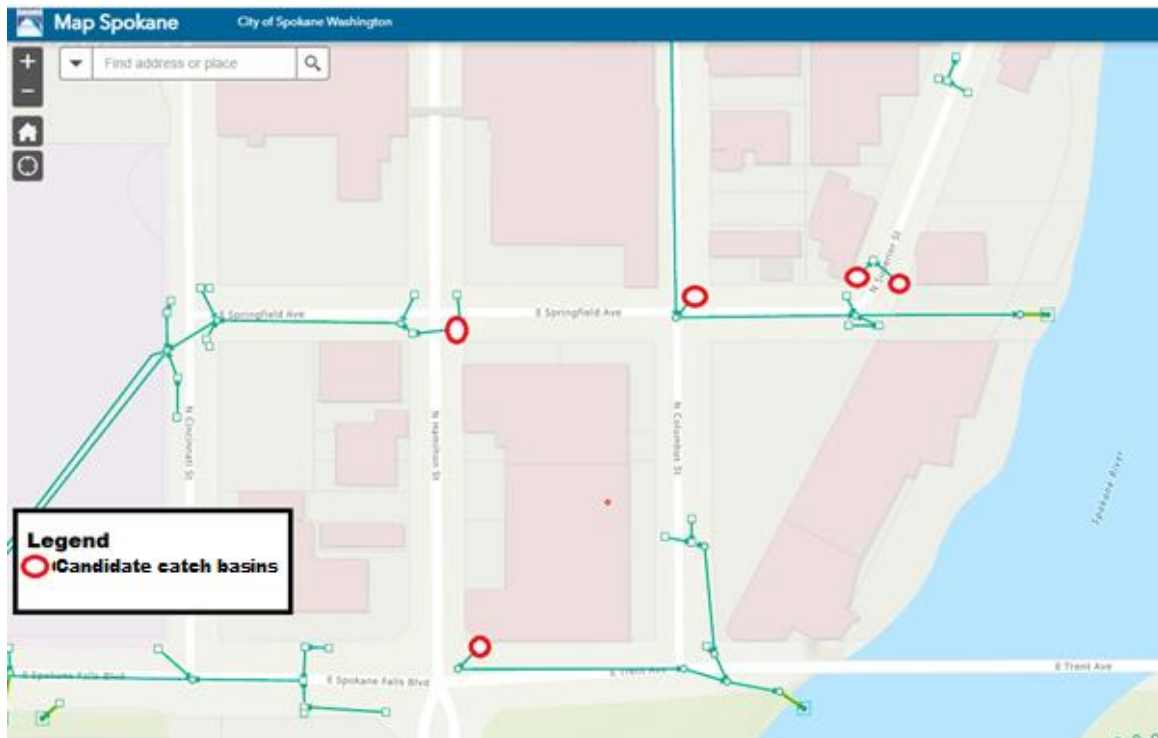
# Springfield Stormwater Catch Basin Sampling

- Background/Purpose
  - PCB detection dog identified several areas of interest in Springfield stormwater basin
  - Intent of sampling is to gain quantitative confirmation of PCB presence
- Scope
  - Sample PCB content in solids at 3 to 5 catch basins near observed contamination
  - Compare observed PCB concentrations to those previously observed in other catch basins
- Conduct more targeted sampling in future if Springfield PCBs concentrations are greater than those found in typical catch basin



# Candidate Catch Basins Relative to PCB Dog Detections

- Comment: Since Springfield basin covers such a small area, why not sample upstream?



# Springfield Stormwater Catch Basin Sampling

## Decision Required

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023
- Budget
  - \$23,850 if done as a stand-alone effort
  - Significantly less if performed in conjunction with other sampling

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collected	August 31, 2022
Laboratory Results	October 31, 2022
Draft technical memorandum	December 16, 2022
Final technical memorandum	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

Item	Budget
Scopes of Work	\$4000
Draft QAPP	\$2000
Final QAPP	\$2000
Field labor	\$1850
Mobilization & demobilization	\$2500
Laboratory analyses	\$6000
Data validation	\$1500
Reporting	\$2000
Data uploading	\$2000
<b>Total</b>	<b>\$23,850</b>

# Artesian Well Sampling

- Background/Purpose
  - Ecology temperature float identified continuous inflow to Mission Reach
    - Initially called artesian well, more likely subsurface drainage
  - Single sample collected in 2021 showed PCB concentrations roughly 10x those seen in the river
- Scope
  - Collect two more samples to confirm elevated concentration
  - Compare homolog distribution to common Aroclors

# Artesian Well Sampling

## Decision Required

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collected	August 31, 2022
Laboratory Results	October 31, 2022
Draft technical memorandum	December 16, 2022
Final technical memorandum	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

- Budget
  - \$15,650 if done as a stand-alone effort
  - Significantly less if performed in conjunction with other sampling

Item	Budget
Draft QAPP	\$2000
Final QAPP	\$2000
Field labor	\$1850
Mobilization & demobilization	\$2500
Laboratory analyses	\$2000
Data validation	\$1500
Reporting	\$2000
Data uploading	\$1800
<b>Total</b>	<b>\$15,650</b>



# Historical Review

- Background/Purpose
  - Majority of PCBs in the river have been traced to legacy contamination
  - Review of historical land uses is a means to identify potential PCB sources
- Scope
  - Review up to 160 Sanborn fire insurance maps from 1952 to 1980 and identify features that were potential sources of PCB releases
  - Review relevant historical documents and associated monitoring data
  - Prioritize sites regarding their potential of being an ongoing PCB source

# Historical Review

## Decision Required

- Schedule
  - Completion fall, 2022

Deliverable	Completion Date
Technical memorandum documenting Sanborn review	August 26, 2022
Technical memorandum documenting historical report review	August 26, 2022
Technical memorandum prioritizing site and recommending next steps	September 30, 2022

- Budget
  - \$57,000
    - Includes purchase of additional Sanborn maps

Item	Budget
Develop Scopes of Work	\$4000
Purchase of additional Sanborn maps	\$5000
Sanborn map review	\$31,000
Review of identified reports	\$5000
Review of relevant groundwater monitoring data	\$5000
Assessment/prioritization of identified sites	\$4000
Reporting	\$3000
<b>Total</b>	<b>\$57,000</b>

# Historical Review

- Need for additional maps
  - Roughly 40 maps for complete coverage
  - Maps for 1960 and 1970 only cover portion of City

Year	Map Count
1910	41
1950	40
1952	40
1955	22
1957	18
1959	18
1960	18
1968	18
1969	18
1970	18
1980	39
1965	17
1902	24
1891	2

# Expanded Object Detection Survey

## Decision Required

- Task Force has already authorized \$10,000 for Gravity to complete portion of object detection survey that was inaccessible last fall
  - Original downstream extent of object detection survey was E. Spokane Falls Blvd.
    - Does not extend downstream far enough to capture Gonzaga site where Ecology had found elevated PCBs in 2018
  - Requesting \$2,047 additional authorization to extend downstream to Gonzaga site

