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Spokane River Regional Toxics Task Force: What's Been Learned, Challenges and Planning for the Future

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Spokane River Forum Conference

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Outline

- What's Been Learned
- Planning for the Future
- Challenges

Background

- Spokane River and Lake Spokane are on Washington's list of impaired waters for PCBs
- Ecology is pursuing a "direct-to-implementation" strategy to address this impairment
  - Led to creation of Spokane River Regional Toxics Task Force

SPOKANE RIVER
REGIONAL TOXICS TASK FORCE

Members of the Community, Stewards of the River

- Spokane River Regional Toxics Task Force
  - Collaborative group of governmental agencies, private industries and environmental organizations
- The Task Force will work collaboratively to:
  - characterize the sources of toxics in the Spokane River
  - identify and implement appropriate actions needed to make measurable progress towards meeting applicable water quality standards

Technical Activities of the Task Force

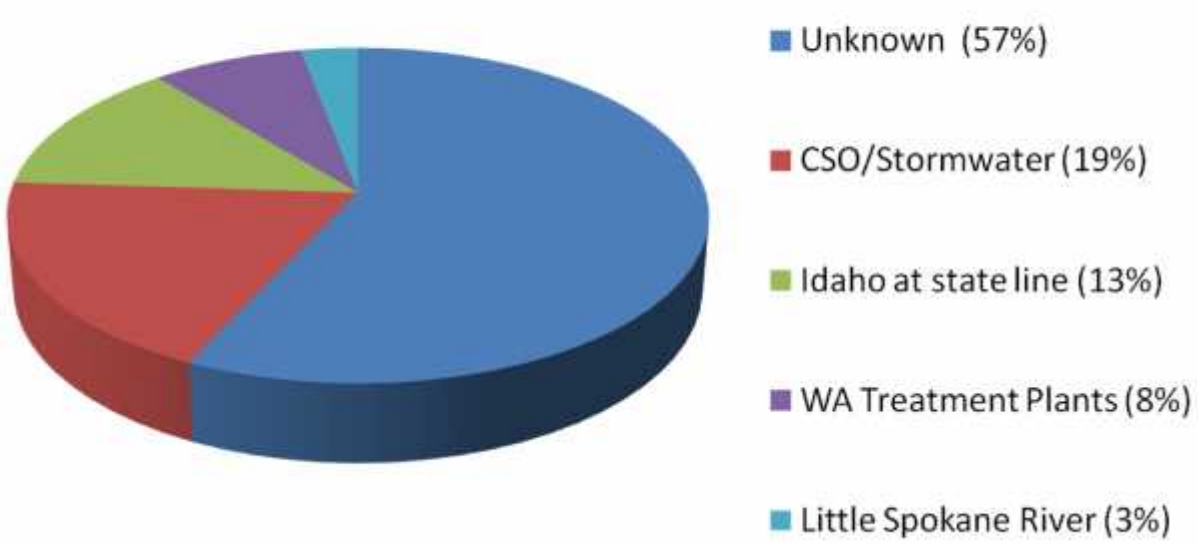
- Work to be conducted in four phases
  1. Gather existing data and identify data gaps
  2. Collect new data
  3. Analyze data
  4. Assess potential “Best Management Practices” and develop Comprehensive Plan

What's Been Learned

- Work is being conducted in four phases
  1. Gather existing data and identify data gaps
  2. Collect new data
  3. Analyze data
  4. Assess potential "Best Management Practices" and develop Comprehensive Plan

Phase 1 Findings: Existing Data/Data Gaps

- Large amount of data already collected, but still a lot to learn on sources of PCBs to the river
  - Groundwater
  - Sources upstream of Idaho State line



Phasing of Technical Activities

1. Gather existing data and identify data gaps
2. Collect new data
3. Analyze data and characterize sources
4. Assess potential Best Management Practices and develop Comprehensive Plan

2014 Monitoring Components

- Synoptic Study
  - Support mass balance assessment
- Confidence Testing
  - Can we expect to get meaningful results from standard grab sampling?

Intent of Synoptic Survey

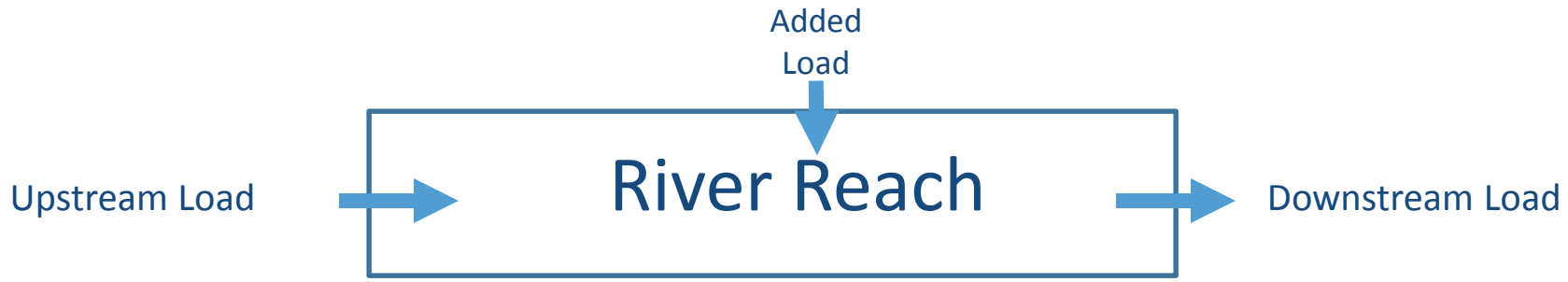
- Measure all known dry weather sources
- Support mass balance assessment to identify “unknown” dry weather sources

Step to Mass Balance Approach

- Measure PCB concentration and flow at:
  - All river flow gaging locations
  - All known dry weather sources
- Convert flow and concentration into load
- Compare loads at “upstream” and “downstream” locations to see if they balance

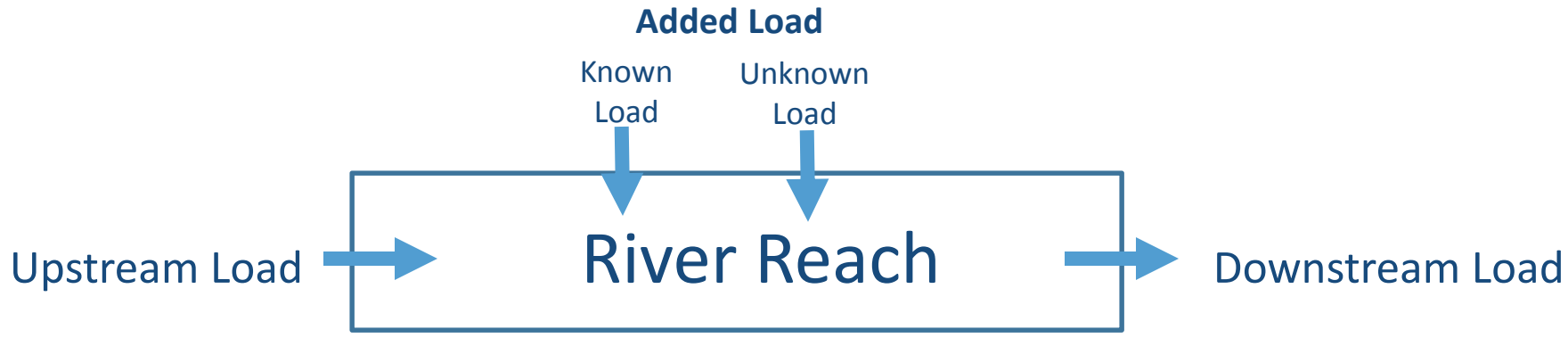
Mass Balance Approach

- Calculate load added between stations
  - Added load = Downstream load – upstream load



Expand to Consider Known Loads

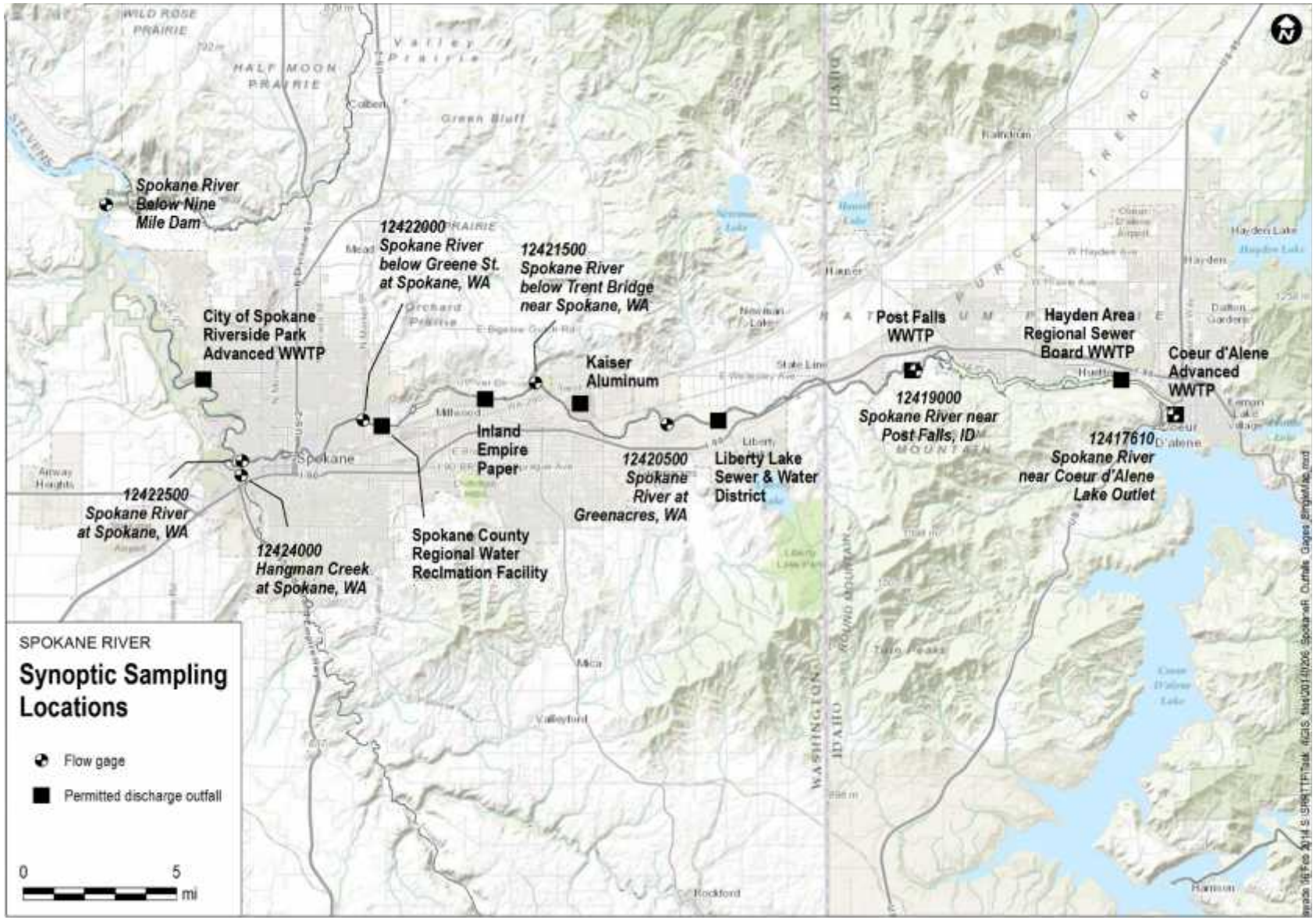
- Added load can be divided into known (e.g. point sources) and unknown components
  - Unknown load = Total added load - known loads



2014 Synoptic Survey

- August 12-24, 2014
- Seven Spokane River stations
- Seven point source discharges, plus Latah Creek

2014 Sampling Locations



Phasing of Technical Activities

1. Gather existing data and identify data gaps
2. Collect new data
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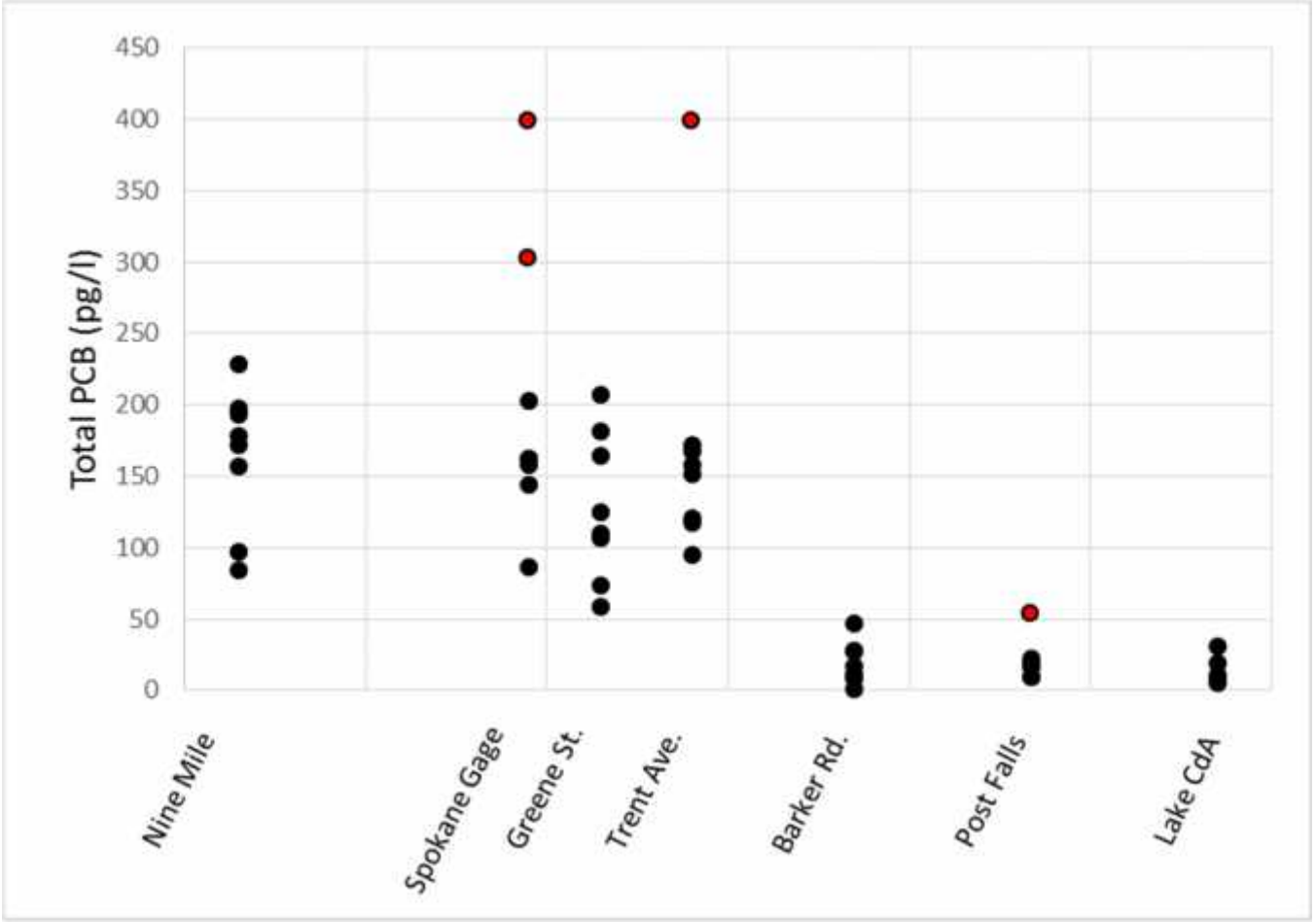
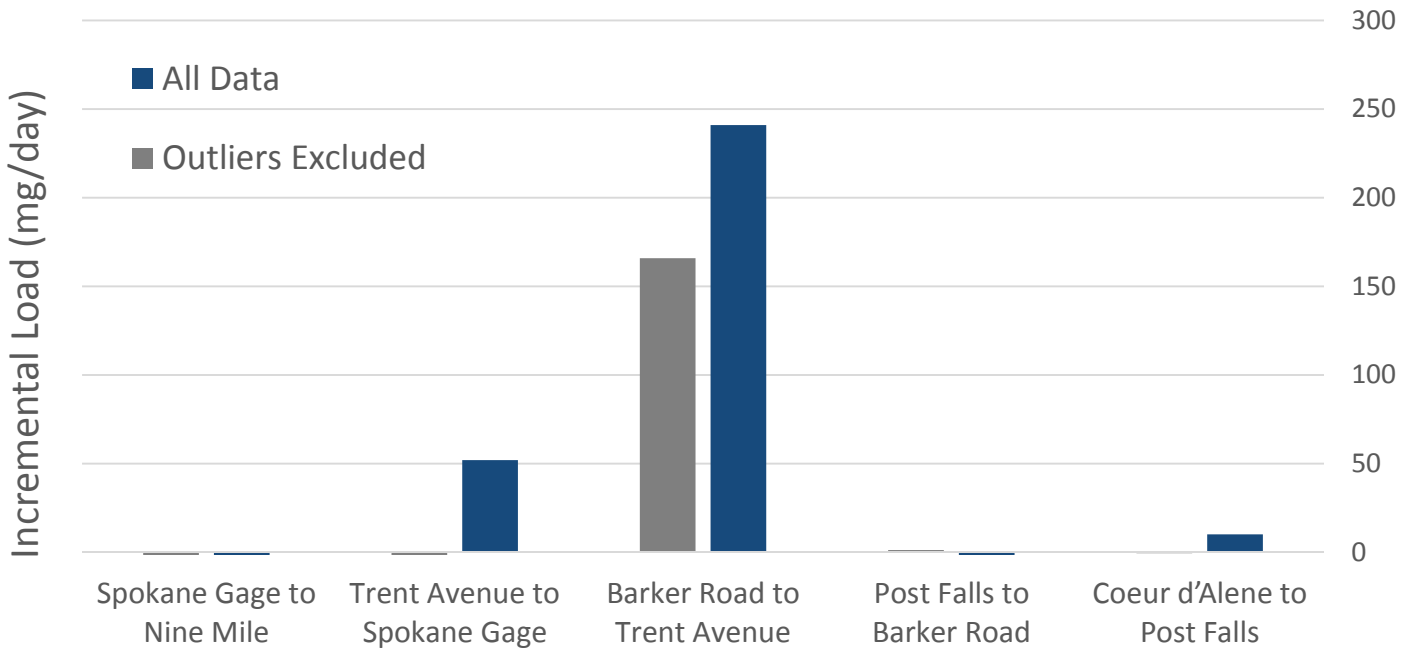
4. Assess potential “Best Management Practices” and develop Comprehensive Plan

River Concentrations

← Flow



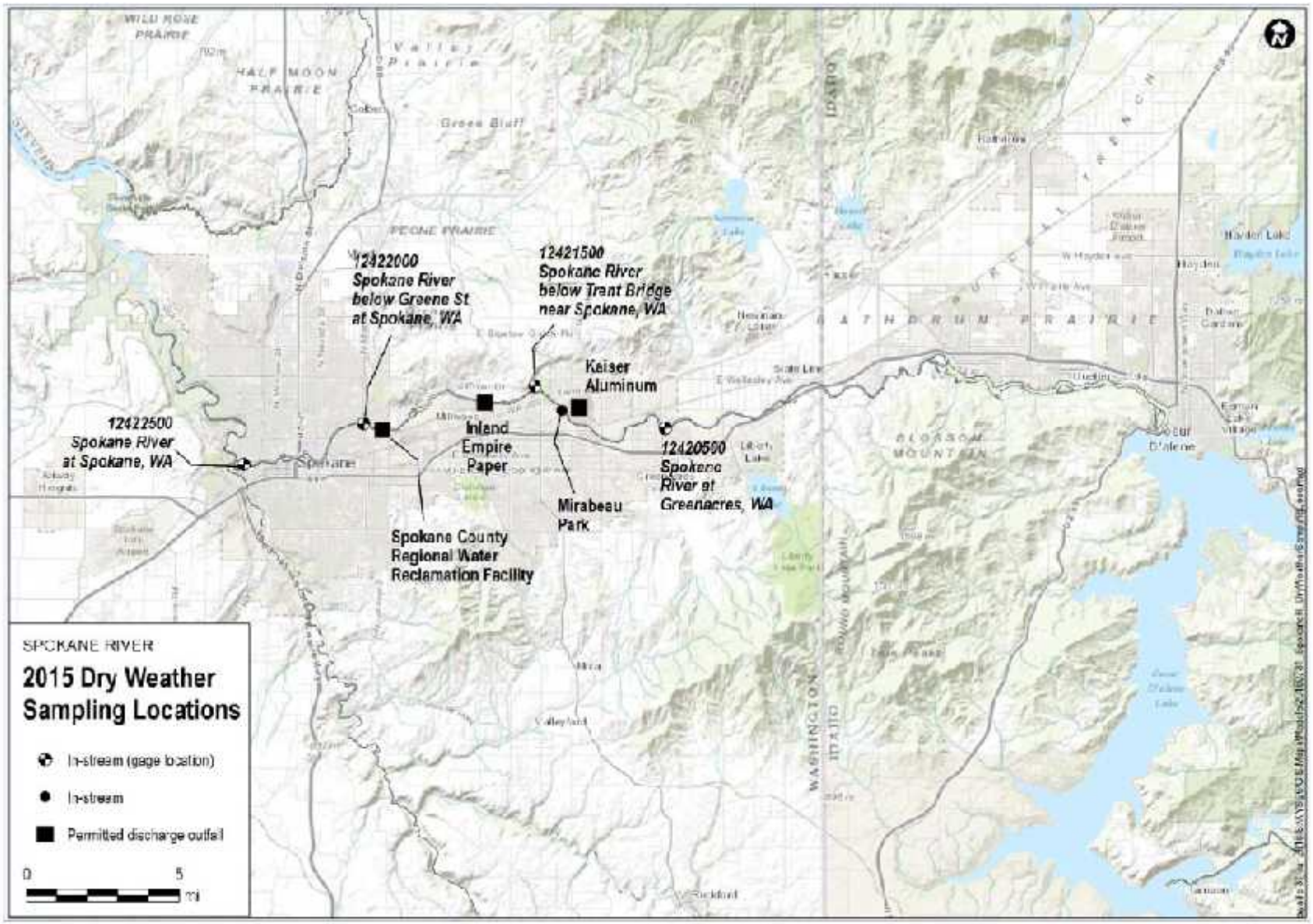
Best Estimate of Unknown Loads



2015 Synoptic Survey

- Intent
  - Confirm findings of 2014 synoptic survey
  - Focus on key groundwater loading areas
    - New station at Mirabeau Park
- August 18-22, 2015

2015 Sampling Locations



2015 River Concentrations

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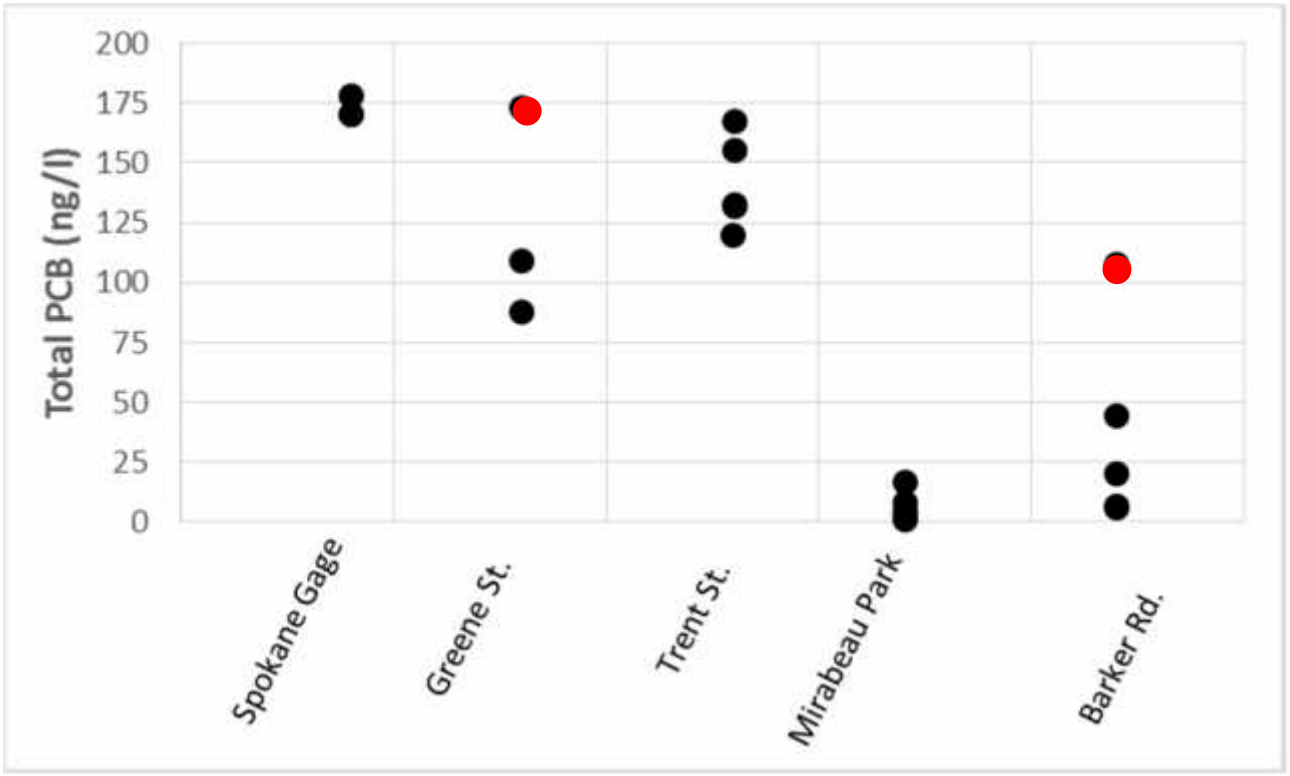
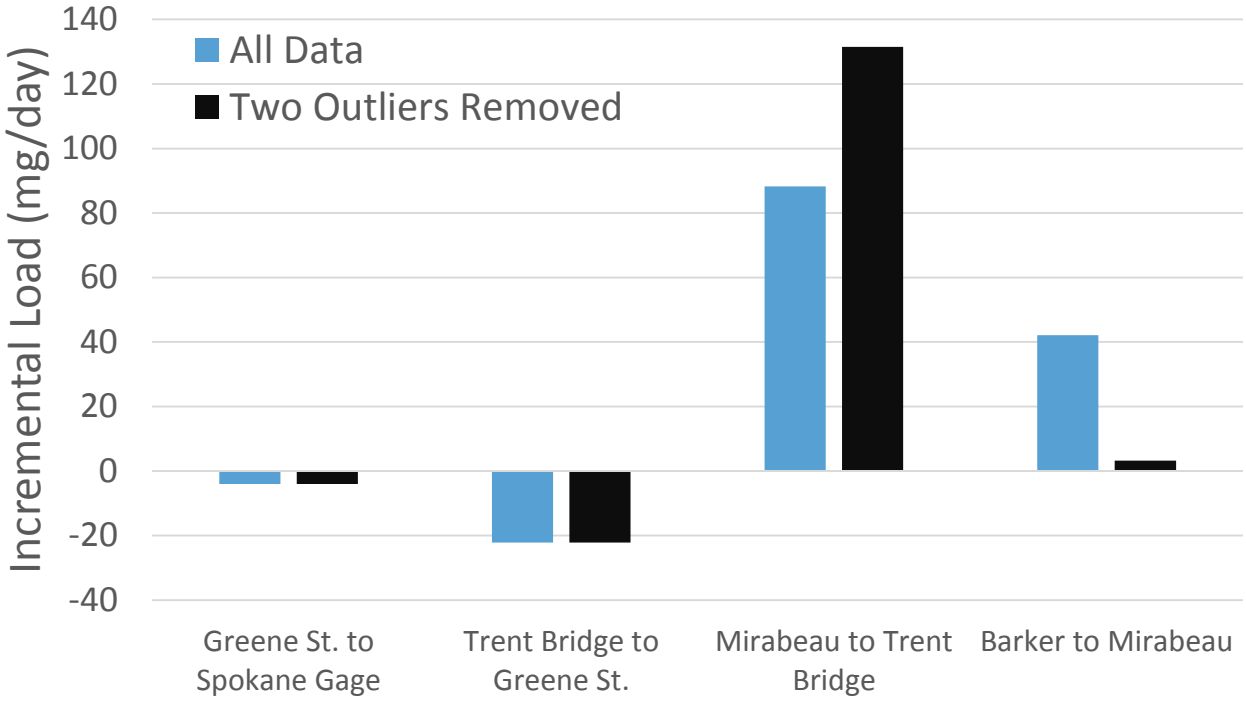


Best Estimate of Unknown Loads



2015 Synoptic Survey Conclusions

- Confirmed presence of significant source between Barker Rd. and Trent Avenue
- Narrowed down location of entry to downstream of Mirabeau Park

Planning for the Future

- Work is being conducted in four phases
  1. Gather existing data and identify data gaps
  2. Collect new data
  3. Analyze data
  4. Assess potential “Best Management Practices” and develop Comprehensive Plan

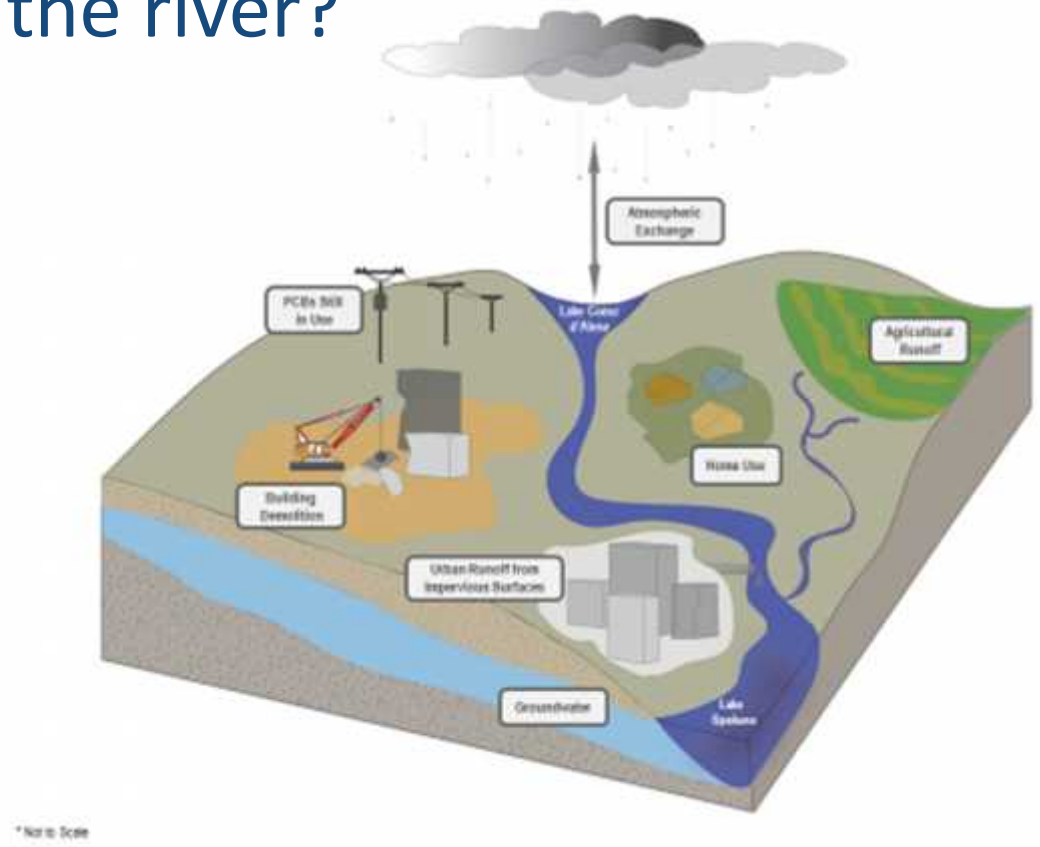
Comprehensive Plan

- Plan will define specific control actions to be taken to reduce PCBs in the Spokane River
- Process
  - Determine where PCBs are coming from, and how they are delivered to the river
  - Evaluate spectrum of controls available to address PCB sources and delivery mechanisms
  - Attain consensus on specific controls to be implemented
  - Develop Comprehensive Plan

PCB Sources and Pathways

- Where do PCBs come from?
- How do they get to the river?

- Categories of sources as pathways can be defined using a conceptual model



Potential Sources of PCBs

- Used in many products until banned in 1979
  - Adhesives and tapes
  - Antifouling compounds
  - Asphalt
  - Brake linings
  - Ceiling tiles
  - Caulks
  - Coal-tar enamel coatings
  - Electrical cable insulation
  - Flame retardant coatings
  - Floor tiles, waxes and sealers
  - Foam
  - Glues
  - Grout
  - Insulation
  - HVAC components
  - Lubricants
  - Pesticide extenders
  - Plastics
  - Roofing
  - Roughcast plaster
  - Rubber gaskets/parts
  - Siding
  - Sound-proofing materials
  - Varnish
  - Waterproofing compounds
  - Window glazing
- Continue to be inadvertently produced today
  - Pigments and dyes

Key Sources and Pathways

- Sources
  - Legacy PCBs in building materials
  - Legacy PCBs in soils
  - Continuing inadvertent production
- Delivery Pathways
  - Wastewater treatment plants
  - Stormwater runoff
  - Contaminated groundwater

Comprehensive Plan: Future Tasks

- Plan will define specific control actions to be taken to reduce PCBs in the Spokane River
- Process
  - Determine where PCBs are coming from, and how they are delivered to the river
  - Evaluate spectrum of controls available to address PCB sources and delivery mechanisms
  - Attain consensus on specific controls to be included
  - Develop Comprehensive Plan

Selection of Controls for Implementation in Spokane

- Generate a menu of control options defining:
  - Effectiveness, cost
- Task Force members will choose among options
  - Workshop to prioritize alternatives this July
- Consensus-based recommendations made
- Recommendations incorporated into Comprehensive Plan

Development of Comprehensive Plan

- Document assessment and agreed-upon actions into a formal report
- Sections describing
  - Watershed characterization
  - PCB source asssessment
  - PCB control action
  - Information/Education
  - Recommended implementation plan
  - Future studies

Schedule

Task: Deliverable	Completion Date
1: Draft memorandum defining inventory of known sources and pathways	January 22, 2016
1: Final memorandum defining inventory of known sources and pathways	February 19, 2015
1: Draft memorandum defining magnitude of loading from each source and pathway	March 28, 2016
1: Final memorandum defining magnitude of loading from each source and pathway	May 18, 2016
2: Draft memorandum defining inventory of BMPs to be considered	February 19, 2016
2: Final memorandum defining inventory of BMPs to be considered	May 18, 2016
2: Draft memorandum defining appropriateness of each BMP.	June 1, 2016
2: Final memorandum defining appropriateness of each BMP.	July 14, 2016
3: Workshop to prioritize alternatives, and identify implementing parties	July 22, 2016
4: Draft comprehensive plan	September 15, 2016
4: Final comprehensive plan	December 16, 2016

Challenges

- Controlling legacy sources where the "cat is out of the bag"
- Stopping ongoing production
  - PCBs are not easily destroyed
  - If PCBs continue to be brought into the watershed, they are going to end up somewhere

Questions/Comments

PCB Blank Contamination

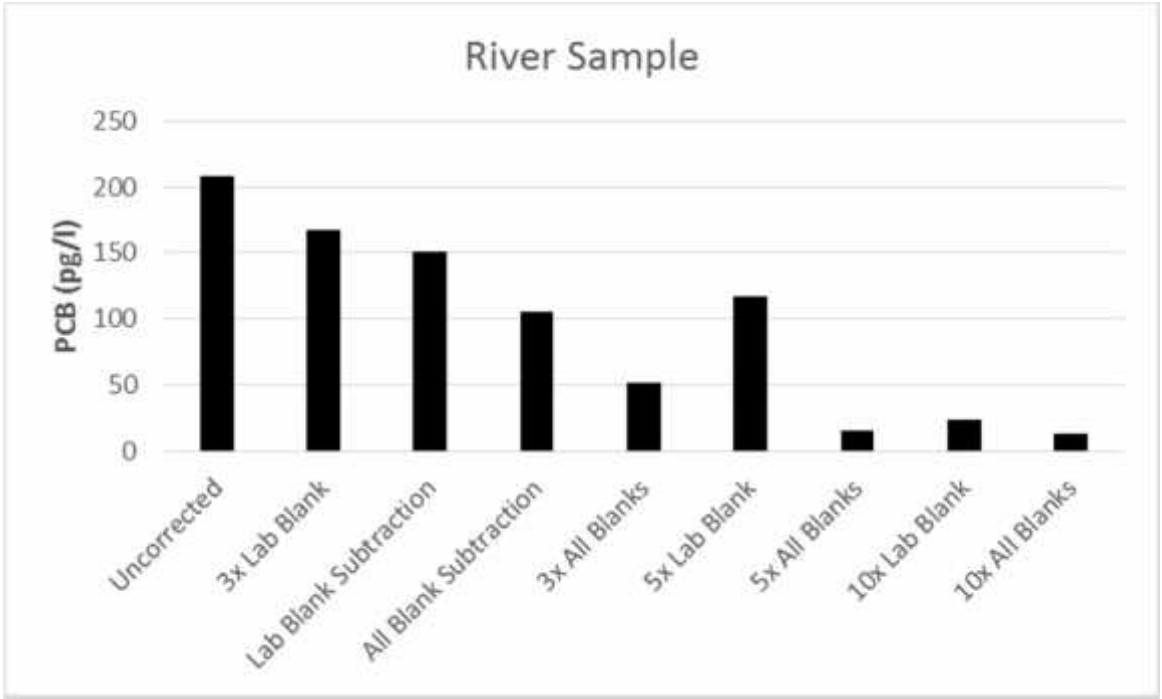
- PCBs are everywhere, including the laboratory
- Even using the cleanest techniques, some amount of contamination is always present
  - Assessed by running “blank” samples

PCB Blank Correction

- PCB field results are adjusted to account for observed blank contamination
- Important in Spokane, because PCB concentrations measured in the River are often at levels similar to what is seen in blank samples

Alternative Blank Correction Methods

- Method of blank correction can greatly influence reported PCB concentration



2014 Monitoring Components

- Synoptic Study
  - Support mass balance assessment
- Confidence Testing
  - Can we expect to get meaningful results from standard grab sampling?
- Seasonally Integrated Sampling
  - Provide information on the seasonal variability of loading from Lake Coeur d'Alene

Confidence Testing

- Determine if meaningful results can be expected from standard grab sampling
  - Are field samples sufficiently greater than blanks?
  - Two locations sampled May 13-19, 2014

Confidence Testing Results

- River concentrations were at similar concentration levels as seen in blanks
- Synoptic survey not expected to support a rigorous mass balance assessment
- Load added between stations will be uncertain

Added load = Downstream load – upstream load

10 = 40 – 30

Confidence Testing Results

- River concentrations were only slightly higher than concentration levels seen in blanks
- Synoptic survey not expected to support a rigorous mass balance assessment
- Load added between stations will be uncertain

Added load = Downstream load – upstream load

10 = 40 – 30

? = 40 (±10) – 30 (±10)

Confidence Testing Results

- River concentrations were only slightly higher than concentration levels seen in blanks
- Synoptic survey not expected to support a rigorous mass balance assessment
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Added load = Downstream load – upstream load

10	=	40	–	30
-10 to 30	=	40 (±10)	–	30 (±10)

Confidence Testing Conclusions

- Synoptic survey still of value
  - Downstream river concentrations should be higher during summer low flow conditions
  - Capable of identifying presence of larger sources
- Data quality objectives modified
  - Support a *semi-quantitative* mass balance assessment, i.e. be able to identify if and where significant unknown sources exist

Institutional BMPs – Governmental

- Take-back programs to accept PCB-containing waste
- Targeted street sweeping
- Purchasing standards/product testing
- Controls on building remodeling or demolition
- Review/revise laws regulating waste disposal
- Survey of utilities to confirm the presence of PCBs in transformers
- Survey PCB-containing lamp ballasts in schools/public buildings

Institutional BMPs – Educational

- Education about legacy sources (caulks, ballasts) of PCBs, and how to manage/replace them
- Education about ongoing sources of PCBs, and safer alternatives

Stormwater Treatment BMPs

- Controls at pipe entrance
  - Capturing solids/PCB prior to entering the stormwater system
- Controls in the pipe system
- Controls at end-of-pipe
  - Sedimentation basins, constructed wetlands

Wastewater Treatment BMPs

- PCB minimization in influent
- Treatment processes

Site Remediation BMPs

- Identification and elimination of storage or use of PCBs
- Identifying older buildings that may contain PCBs

Development of Comprehensive Plan

- Document assessment and agreed-upon actions into a formal document
- Sections describing
  - Watershed characterization
  - PCB source sssessment
  - PCB best management practices
  - Information/Education
  - Recommended implementation plan
  - Future studies