Follow-up to Mass Balance Assessment based on Workshop Feedback

Dave Dilks
SRRTTF
February 26, 2015
Topics

- Follow-up items identified at workshop
- Activities conducted post-workshop
- Next steps
Follow-Up Activities Identified

• Include J_Flagged PCB data
• Consider stormwater and CSO loading
• Add Greene St. segment
• Conduct sensitivity to groundwater quality assumption
• Evaluate flows at Nine Mile
• Provide detailed summary of PCB concentrations at each sampling location
Include J-Flagged PCB Data

• Workshop consensus: J-flagged data should be included in the mass balance assessment
• Update: J-flagged data have been used all along, but not NJ-flagged data
  – J flag: Concentration less than quantitation limit
  – NJ flag: Presumptively present at approximate quantity
Consider Stormwater and CSO Loading

• Original mass balance assessment did not consider stormwater and CSO loading that occurred during the synoptic survey

• City of Spokane provided estimates of loads
  – Analysis of data indicates CSO and stormwater contributed less than 10% of observed river loads
Add Greene St. Segment

- Original analysis did not have flow estimate for Greene St.
  - Trent Ave. to Spokane gage reaches combined
- Spokane County and Ecology have provided method to estimate flows
  - Divide into two reaches
  - Interim results showed potential for another unknown source
Sensitivity to Groundwater Quality Assumption

- Mass balance assessment assumed that groundwater lost from an upstream reach re-entered in the next downstream reach at the same concentration at which it left.
Sensitivity to Groundwater Quality Assumption

- Conduct sensitivity analysis assuming that lost groundwater is permanently lost, and replaced by clean groundwater
  - Range of results from the two methods should bound the true answer
Evaluate Flows at Nine Mile

• Questions were raised at the workshop regarding the accuracy of the flows assumed at Nine Mile
  – Gravity-reported flows were the sum of Spokane Gage and Hangman Creek Gages
  – Flow information obtained from Avista
    • Sum of Spokane Gage, Hangman Creek Gage, and pool level changes.
    • Avista dropped pool by 2 to 4 feet on 8/15/14
Next Steps

• Closure of synoptic sampling issues
• High level scoping for next phase
• Lessons learned
Closure of Synoptic Sampling Issues

• Document consideration of wet weather loads
  – Future wet weather sampling will address the issue of storm contribution

• Finalize addition of Greene St. reach
  – Update analysis with more rigorous flow estimate
  – Make recommendation on repeating dry weather sampling in these two reaches

• Update Nine Mile flows with Avista data
Closure of Synoptic Sampling Issues

- Conduct sensitivity analysis regarding groundwater flow of final mass balance
- Provide summary data output for each sampling location
  - Tables including
    - total PCB
    - PCB homologues
    - conventional parameters
High Level Scoping for Next Phase

- Assess “unknown” load in Barker Road to Trent Avenue reach
- Assess wet weather contribution
Unknown Load in Barker to Trent Reach

• Data mining
  – Use synoptic data (homologues) to identify approximate "fingerprint" for unidentified source
  – Get hydrologic information on groundwater area that recharges this river segment
  – Inventory wells (production and monitoring) and the screened intervals in the identified area
  – Collect any congener data available in the identified wells
Unknown Load in Barker to Trent Reach

- Determine what groundwater sampling may be needed to fill in gaps
- Develop monitoring alternatives
  - Discuss results with SRRTTF
- Prepare scope of work for sampling

- Conduct sampling
Assess Wet Weather Contribution

• Data mining
  – Identify stormwater discharge locations into the river
  – Identify river reaches receiving direct stormwater discharge
  – Review existing monitoring data
Unknown Load in Barker to Trent Reach

- Determine what wet weather sampling may be needed to fill in gaps
  - Assess feasibility of obtaining useful results
  - Assess viability of high volume sampling
- Develop monitoring alternatives
  - Discuss results with SRRTTF
- Prepare scope of work for sampling

- Conduct sampling
Synoptic Survey Lessons Learned

• Flow measurement capability needs to be in place at the Green Street gage for future sampling efforts

• The importance of flow measurement capability at Lake Coeur d'Alene and below Nine Mile needs to be evaluated for future sampling events