

High Level Scoping for Upcoming Monitoring

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Background

- First phase of work in 2013 identified key data gaps/needs for additional monitoring on
 - Wet weather PCB loading
 - Groundwater loading
- Dry weather monitoring conducted in 2014
 - Identified likely groundwater source between Barker Rd. and Trent Ave.
 - Identified potential groundwater source between Greene St. and Spokane gage



Background

- 2015 workshop recommended data collection on the following
 - Sources contributing to the ground water load
 - Wet weather sources
- High level scoping recommended as first step
 - Conduct data mining
 - Assess feasibility of obtaining useful results
 - Propose monitoring alternatives



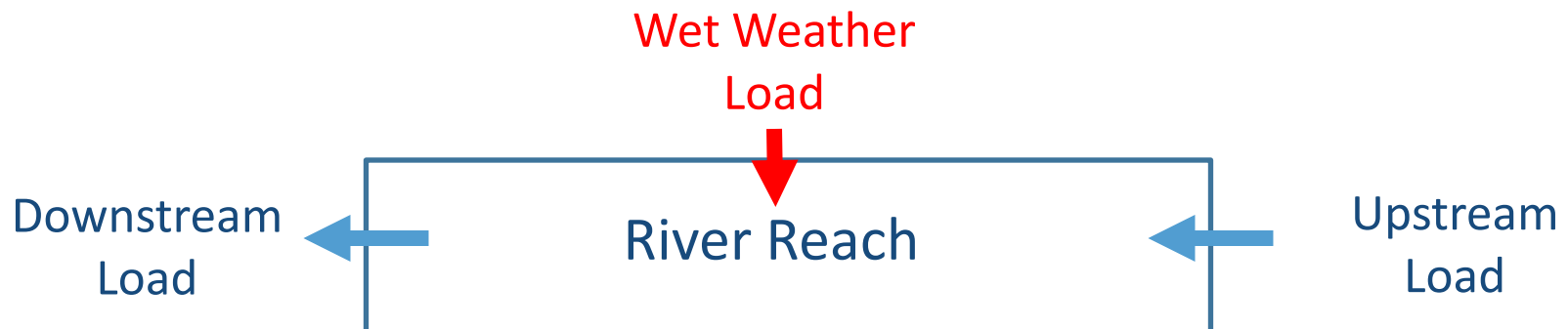
Background

- Staggered time frame for high level scoping tasks
- Initial scoping on wet weather sources has already been conducted, and presented to the Technical Track Working Group
 - Ready for a formal decision
- Initial scoping on sources contributing to the ground water load is underway
 - Brief status report is being presented today



Wet Weather Loading: Intended Approach

- Conduct in-river mass balance assessment similar to what was done for dry weather
 - Measure mass load passing through upstream and downstream boundary points (i.e. gage locations)
 - Back-calculate wet weather load to segment
- Wet weather load = Downstream load - upstream load



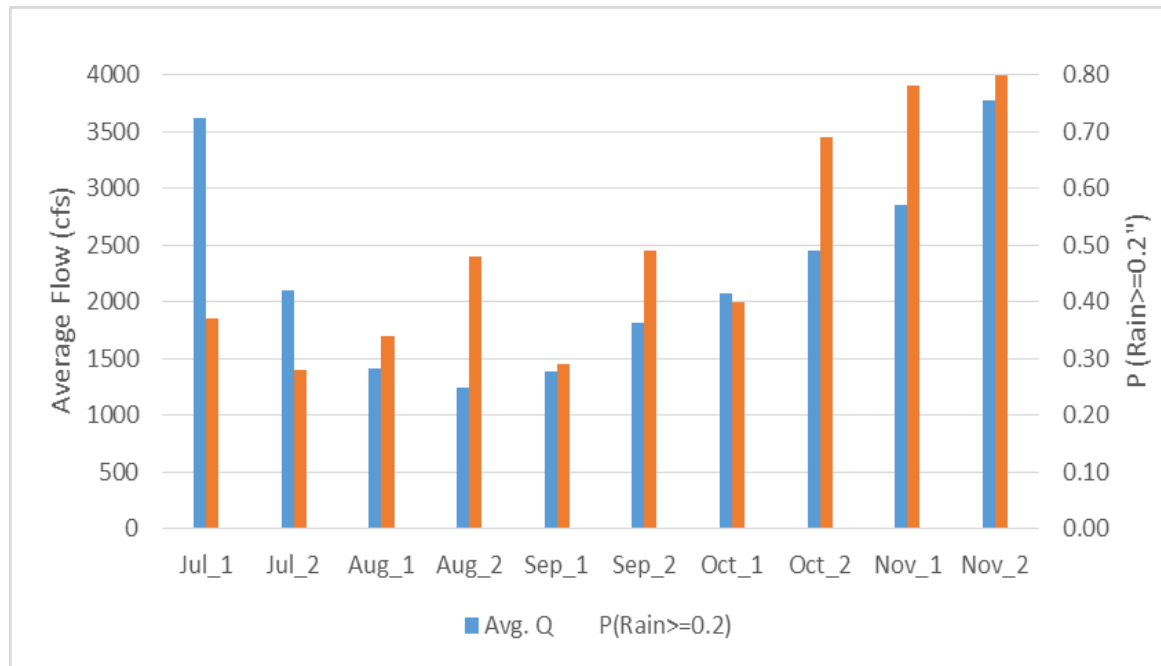
Wet Weather Feasibility Assessment

- Define what type of data (i.e. frequency, detection limits) are necessary to provide credible results
- Begin by calculating the increase in river concentration expected to occur during wet weather
 - Depends on season of the year



Seasonal Rainfall and River Flows

- Examine historical data by half-month periods
 - Low river flow in summer, but lower likelihood of rain
 - Higher likelihood of rain in the fall, but higher flows



Conclusions

- Noticeable wet weather increases in concentration unlikely between Trent Ave. and Spokane Gage
 - Mass balance approach assumes steady conditions
 - Wet weather condition will be far from steady
- Possibility of detectable increase between Spokane Gage and Nine Mile, but confounding effects due to:
 - Hangman Creek load
 - Non-steady Nine Mile Dam operation



Conclusions

- Is there any benefit to a wet weather mass balance assessment?
 - Could confirm existing assessment that wet weather concentrations increases are typically small
 - Fortuitous weather conditions could provide a much larger than average storm event
- Not that desirable of an option



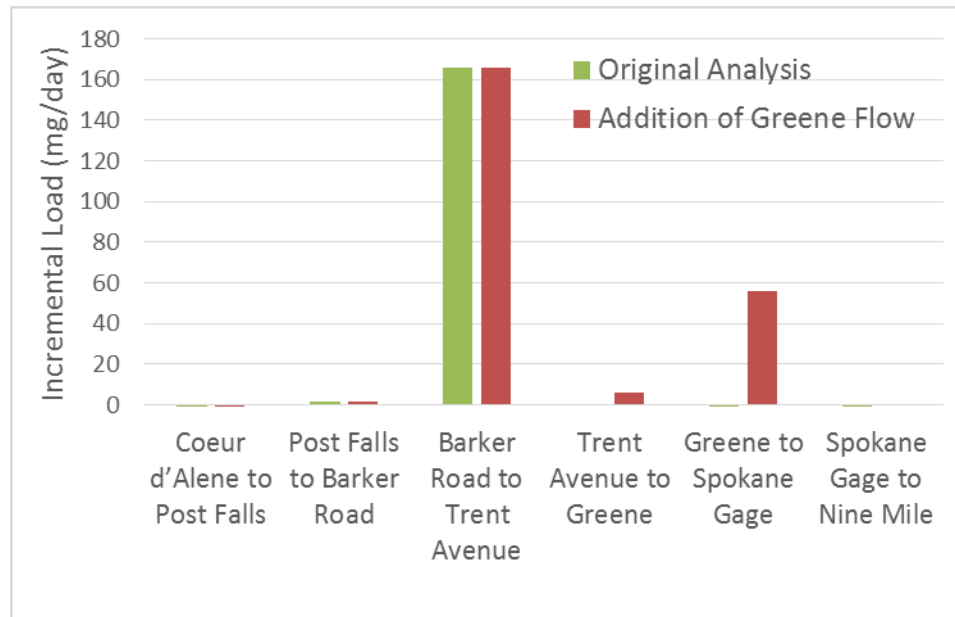
Other Monitoring Options

1. Direct measurement of wet weather loads
 - City of Spokane
 - MS4 concentrations from other municipalities
 - Hangman Creek
2. Additional dry weather monitoring
 - Given the amount of wet weather data collected since 2013, data gap isn't as large as it was
 - Focus instead on follow-up to dry weather assessment



Alternative to Wet Weather Monitoring

- Addition of Greene St. flow “data” indicates potential for additional dry weather source



Outcome of Technical Work Group

- Four monitoring options recommended for further consideration by Task Force
 1. Revisit/confirm dry weather assessment for Barker Rd. to Trent segment
 2. Revisit/confirm dry weather assessment for Greene St. to Trent gage segment
 3. Limited sampling of stormwater outfalls
 4. Wet weather sampling of Hangman Creek



Dry Weather Confirmation Sampling

- One week of daily measurements
 - Late summer
- Include testing of high-volume sampling
- Costs
 - Barker Rd. to Trent only: \$40,000
 - Greene St. to Spokane gage only: \$40,000
 - Both segments: \$65,000



Stormwater Loading Assessment

- Event monitoring of a subset of City of Spokane outfalls
 - Single event at five outfalls



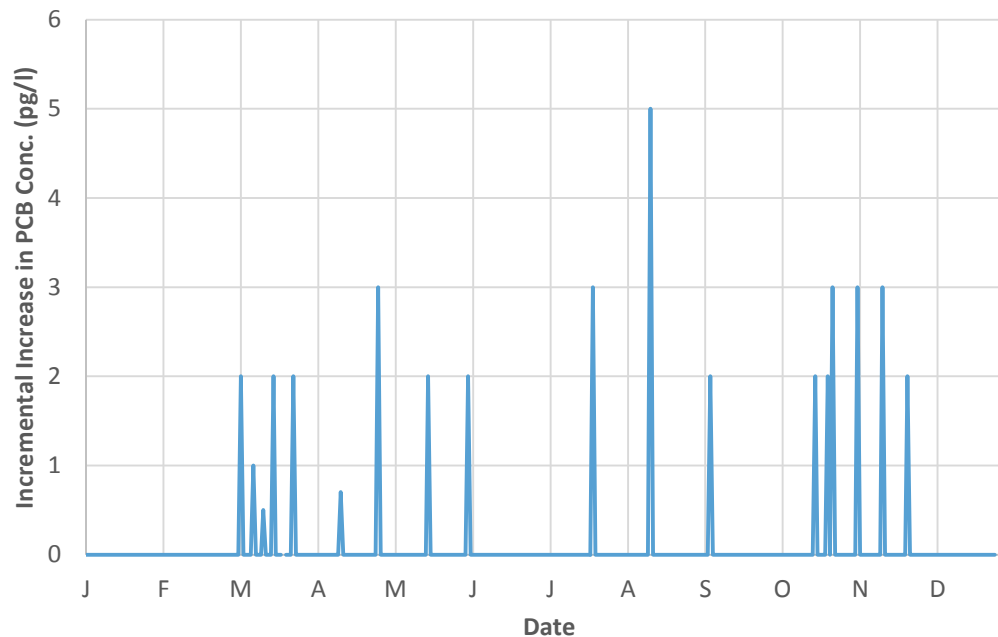
Stormwater Loading Assessment

- Monitoring could be combined with a retrospective look at river flows to estimate historical concentration impact of stormwater
 - Back-calculate stormwater flow from stream gages
 - Estimate stormwater concentration from data
 - Use dilution calculation to estimate incremental increase in stream concentration



Stormwater Loading Assessment

- Example retrospective analysis



- Could be used to better put stormwater loads in context



Stormwater Loading Assessment

- Costs
 - Monitoring: \$14,000
 - Retrospective analysis: \$7,500



Hangman Creek Monitoring

- Monitor at Creek mouth following a wet weather event
 - Twice-daily monitoring for three days
- Costs
 - \$27,000



Summary of Options

- Updated dry weather mass balance
 - Barker Rd. to Trent only: \$40,000
 - Greene St. to Spokane gage only: \$40,000
 - Both segments: \$65,000
- Additional wet weather monitoring
 - City of Spokane stormwater: \$14,000
 - Hangman Creek: \$27,000
- Retrospective loading analysis: \$7,500



Scoping for Groundwater Loading

- Define where the “unknown” source is coming from
- Groundwater data collected by Kaiser show:
 - Very high, but very localized concentrations
 - Background contamination of unknown extent
- Simple mass loading analysis being conducted to assess
 - What fraction of the estimated unknown load is from the localized source?
 - How widespread would the background concentration need to be to explain the unknown load?
- Specific monitoring recommendations will follow

