Long Term Monitoring Program
Discussion of Recommendations to Task Force

Dave Dilks
Spokane River Regional Toxics Task Force
April 8, 2020 Technical Track Work Group Meeting
Background

• Reviewed 16 different methodologies for supporting long term monitoring
• Have reached consensus on fish sampling as one component
• Nearing consensus on passive water column sampling as a second component
  - A few details left for discussion
    • Which sampling medium: SPMDs or other?
    • How many stations?
    • How frequently?
Passive Sampling

• Passive = No moving parts
• Deploy sampling device in the field for extended period of time
• Device integrates concentrations over deployment period

• Many different sampling media have been used
  – SPMDs, polyethylene, polyoxymethylene, polydimethylsiloxane, ...
  – All follow the same basic principle
Evaluation of Passive Sampling Media

• Scientific literature

• Expert interviews
  – David Alvarez, Chief, Environmental Chemistry Branch, USGS Columbia Environmental Research Center
  – Richard Grace, SGS AXYS Analytical Services

• Current field activities at other sites
High Level Review Summary

• Many options exist to accurately characterize PCB concentrations
  – Preference depends on site-specific application
• SPMDs and polyethylene quickly rise to the top for Spokane
  – Possess larger volume of sorbent, therefore better integrate concentrations over the entire month-long deployment
High Level Review Summary

• The field may be trending towards polyethylene
  - “Single-phase polymeric PSDs, such as LDPE and SR are becoming increasingly used due their simplicity and high performance and compatibility with simplified analytical methods for their extraction.” (Taylor et al, 2019)

• Both experts consulted have a preference for SPMDs
  - “Personally, I think your best options are down to the SPMD and PE. I’d lean towards the SPMD due to its larger sampling volume, ease/reproducibility for adding PRCs, and commercial availability” (Alvarez, pers. comm.)
  - “SPMDs are likely the best choice. The SPMDs are more durable in the field, have base case data from WA ECY, and can be readily deployed at 1 month (integrated sample). PEDs do not have the history in very low level environments such as SRRRTTF” (Grace, pers. comm.)
How Many Stations/Where to Sample?

- Only imperative location is downstream of Spokane
  - Will show cumulative effect of all load reductions
- Fish sampling being conducted in six reaches
- Intermediate option suggested by Bud Leber

<table>
<thead>
<tr>
<th>Passive Sampling Deployment Areas</th>
<th>Comprehensive Plan</th>
<th>Passive Sampling Deployment Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB Conc. (pg/L)</td>
<td>Table 1</td>
<td>Table 1</td>
</tr>
<tr>
<td>Greenacres/Barker Road</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Mirabeau Point</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Kaiser Outfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trent Bridge/Plante's Ferry Park</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>Inland Empire Paper Outfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upriver HED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spokane County WWTP Outfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Street Bridge</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Upper Falls HED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe Street HED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spokane Gauge</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>City of Spokane WWTP Outfall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nine Mile HED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below Nine Mile Dam</td>
<td>144</td>
<td></td>
</tr>
</tbody>
</table>
How Frequently?

• Prior assessment recommended three sampling events over the course of a sampling year, corresponding to the three hydrologic regimes
  – spring high flow
  – summer low flow
  – winter moderate flow
Discussion