

Spokane River Stewardship Partners

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March 15, 2017

Susan Braley
Water Quality Program
WA Department of Ecology
Lacey, WA

RE: 2016 – 2017 Water Quality Policy 1-11 Update Process – Surface Water 303(d)

Dear Susan,

Per our conversation this week, this letter provides preliminary collective comment from the NPDES permittees who are members of the Spokane River Stewardship Partners (SRSP) on several issues pertaining to Ecology's Water Quality Policy 1-11 discussions prior to your agency's formal update of Chapters One and Two of said policy. These high-level comments are summarized by issue and are followed by a brief case study of PCBs in the Spokane River (see Section VII) to further clarify the comments and suggestions. We trust this information can be used to further discussions at the Policy 1-11 workshop on March 30, 2017. Using specific examples, or case studies, will help to ensure a collective understanding at the workshop.

- I. **The SRSP strongly support the “multiple lines of evidence” concept when using fish tissue for listing an impaired water body. We do not support a Category 5 listing based solely on fish tissue if water column concentrations do not exceed the water quality standard (WQS).**
 - a. **Multiple lines of evidence are necessary to provide a scientifically based causal link to the pollutant source necessary in establishing a TMDL.**
 - b. **Multiple lines of evidence are necessary to ensure that the regulatory action addresses the true source of the fish tissue contamination.**
 - c. **Multiple lines of evidence approach should apply to all lines of evidence, not just Human Health Criteria. Other lines of evidence should include:**
 - Water column data
 - Presence of edible species
 - Temporal extent of tissue samples and age of those fish
 - WDOH Advisories
 - Known Pollutant Sources (eg., MTCA)
 - Sediment Data

- Site Specific concerns
- Severity of impact on human health and the environment
- Quantity and Quality of data
- Natural conditions exceeding standards

The SRSP's understanding is that Water Quality Policy 1-11 is intended to guide Ecology in their assessment of waterbody segments to determine whether surface water quality standards are being met (WAC 173-201A). The resulting categorical listings should identify the status of the waterbody segment and denote future regulatory action. One of our major concerns is that, in the case of a water column listing based solely on measured fish tissue concentration, the listing and future regulatory action may not address the primary source of the fish contamination, and may inaccurately assume that the water column is the sole source of exceedances measured in fish. The listing policy must address the scientifically based causal link to the pollutant to avoid future problems in establishing a valid TMDL and associated load and wasteload allocations. Fish tissue concentrations will not improve if the actual source of the contamination is not identified and then subsequently addressed.

We strongly concur with your "multiple lines of evidence" approach to a listing that is based on fish tissue concentrations. It appears that some of those lines of evidence may have been eliminated between the December and February workshops and we request that the March 30th workshop specifically address the evidence you are considering at this time.

II. Use of a calculated fish tissue equivalent concentration (FTEC) to provide a linear relationship between water column concentration and fish tissue concentration is oversimplified science and we appreciate that Ecology is "rethinking how it might be used". The Tissue Exposure Concentration (TEC) is a step in the right direction, but only if used with multiple lines of evidence. If measured fish tissue concentrations exceed FTEC or a TEC threshold, but other lines of evidence such as measured water column concentrations do not illustrate a water quality standard exceedance or an obvious source pathway, consider parking the listing in an alternative Category (Category 2 or 4B) pending further data collection and analysis.

There are many variables involved in both the measurement of a chemical in fish and the multiple fate and transport pathways for a chemical to reach fish. In application to water quality standards, fish tissue concentration exceeding FTEC or the proposed TEC may result in a Category 5 listing of a contaminant in the water column, although the water column may not be the actual source or pathway. Congener level PCB data from the Spokane River are beginning to shed some light on this situation. Elevated levels of PCBs in fish can also result from fish food used in hatcheries, from legacy contamination that resulted decades ago and is not indicative of current water column concentrations, from sediment and other food sources, and even from other fish. Should a very few data values on a surrogate parameter – fish tissue - be the sole basis for a Category 5 water column listing? Clearly not if there are more dependable and direct measurements of the water column. The Spokane River example in Section VII demonstrates this point.

III. We support the use of a TEC (tissue exposure concentration) value in lieu of an FTEC, IF used with multiple lines of evidence. Ecology's workshop presentation provided significant support for the TEC approach when combined with a weight of evidence and multiple lines of evidence approach. We also support the preference for 3 composite samples. However, a TEC should not be used on its own to support a Category 5 impairment listing for the reasons discussed above in Section II.

IV. We suggest some method of weighting the multiple lines of evidence to establish a Category 5 listing (for example: Fish Tissue Exceedance + Water Column Exceedance = Cat. 5 or Fish Tissue Exceedance + Sediment Exceedance = Cat. 5).

If fish tissue indicates an exceedance via an FTEC approach or a TEC approach, but chemical analyses of other media do not illustrate a source pathway, consider placing the water body in an alternative Category pending further data collection. Consider Category 4B and a process such as the SRRTTF to further investigate. If an organized process is not likely, consider Category 2 until such time that sufficient data can be collected for a legitimate TMDL that recognizes true source pathways.

V. Policy 1-11 must include clear pathways for delisting. We support the “multiple lines of evidence” concept for both listing and delisting impaired water bodies.

VI. Ecology should coordinate its data collection activities so that sampling for fish, sediment and the water column is co-located and occurs during the same timeframes. In this way, a more informed decision on categorizing waterbodies can be made.

VII. Spokane River Illustration

Introduction

The Spokane River Regional Toxics Task Force (SRRTTF), of which we are all involved, has been working collaboratively for over four years to reduce PCBs in the Spokane River. Recent data collection and analysis efforts indicate how multiple lines of evidence might be useful in assessment of water body segments. We have been collecting and analyzing congener level PCB data using method 1668 under a Quality Assurance Project Plan (QAPP) that has been approved by Ecology, EPA Region 10 and Idaho DEQ. These data are comparable to Ecology’s most recent fish tissue study in the river (Ecology, 2014). There is much to learn from these investigations.

The Task Force has conducted multi-year sampling including (1) Ambient river sampling, (2) Point source discharge sampling, and (3) General aquifer sampling. This work has also yielded PCB information relative to groundwater recharge to the river in gaining reaches. Ecology has available fish tissue data from the 2012 sampling event on Spokane River in the vicinity of our ambient river samples. Figure 1 shows the fish tissue and water column sampling locations in the Spokane River. Analyses of both fish tissue and water column concentrations were completed with Method 1668 congener level data. In addition, there are some data on fish age. Although full congener level analyses have not been completed, a cursory look at the data suggest the following:

Observations

- To date, arithmetic and geometric mean water column concentrations of total PCB at all riverine stations on Figure 1 show compliance with the previous Washington State Water Quality Standard of 170 pg/L which was revised by EPA in December of 2016 (LimnoTech, 2016 – Table 1). However, segments of the Spokane River have been listed for PCBs on the 1996 and 1998 303(d) list and as a Category 5 in the 2004, 2008, 2012 and current water quality assessments based solely on the presence of total PCBs in fish tissue and an FTEC assumption. Note that some of the segments that are currently listed are based on fish tissue results from a study by Johnson that was published in 2000 and based on measurements of Rainbow Trout and Largescale Sucker (LSS) sampled in 1999. We understand that hatchery rainbow trout can have significant levels of PCB from hatchery fish food (Ecology, 2006), and that LSS could have been

up to 20 years old in 1999 based on their life history (personal communication, WDFW). In neither case can one assume that the concentration of PCB in fish is directly attributable to **current day** water column concentrations.

- Figure 2 shows total PCB levels in large scale suckers (LSS) at various locations in the river verses fish age. The horizontal orange lines indicate approximate average PCB levels in fish at four different locations in the river where Task Force PCB water column data in the river ranges from 107 to 132 pg/l. While the river concentration of PCB at these four locations varies by approximately 20%, the fish concentrations vary by a factor of five. In addition, the dark blue horizontal line indicates the approximate average PCB levels in fish at an upstream location (Idaho/Washington Stateline) where Task Force PCB water column data in the river ranged from 14 to 18 pg/L. As shown by the dark blue line, fish PCB levels were within the same range at this location as they were where PCB water column levels were 5 to 7 times higher. This indicates that water column concentration is not likely the only predictor of fish tissue concentration in these locations. These data also indicate a relationship between PCB content and fish age, especially at RM 33.7. This makes sense for a species with a relatively long life span that resides on the bottoms of lakes and rivers. If tissue exposure concentrations are going to be used as a basis of water column listings, it is important that those fish are of an age that more closely represents present day water column concentrations. A fish that has bioaccumulated 20 years of PCB is not representative of current day water column exposures.
- Although the Task Force has not completed the data analyses for their 2014-2016 data set, the SRSP has taken a cursory look at individual PCB congeners in the water column in the river and in fish in the vicinity of those water column measurements. In Figure 3, congener level data representing approximately 50% of the mass of total PCB in Large Scale Suckers (Ecology, 2014) are compared to the concentration of those congeners measured in the Spokane River water column in 2014 in the vicinity of Plante's Ferry/Trent (Figure 1). Total PCB levels in the three fish samples ranged from 80 ng/g to 139 ng/g. The fish to water column comparison was made with one of the river samples collected at Plante's Ferry in August 2014 that appears to have the lowest laboratory blank level. (Laboratory blank correction was made at the individual congener level using the protocol contained in the Task Force's QAPP.) Of the 12 congeners that made up approximately 50% of the PCB mass in the three sets of fish samples from 2012, 7 of the congeners present in the fish had a water column concentration of 0 pg/L after blank correction. The other 5 congeners had a combined total concentration of approximately 13 pg/L. Again, these cursory analyses indicate that, at the congener level, the water column may not be the primary source of PCB levels in fish in the Spokane River, and more assessment is needed to confirm source pathways.

Conclusions

The purpose of a 303(d) listing is ultimately to identify and categorize a water quality problem and then to eliminate the problem by actions that improve the water quality. If the TEC is used to place a water body in Category 5 based on fish tissue concentration alone, and the water column is further regulated via NPDES permits, it is possible that the true source of fish contamination will not be identified and the problem not rectified. Investigations beyond fish tissue data are clearly indicated. Comparable congener level data are needed for fish, water column, discharges and sediment. A more thorough, scientifically based analysis is needed to determine what media actually contribute to fish tissue contamination. Multiple lines of evidence should be used to justify a Category 5 listing. We strongly recommend using a "Waters of Concern Category" (Category 2) until adequate data are available to understand the mechanisms contributing to fish exceedances.

Respectfully Submitted,

City of Spokane
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Liberty Lake Sewer and Water District
Hayden Area Regional Sewer Board
City of Post Falls
City of Coeur d'Alene
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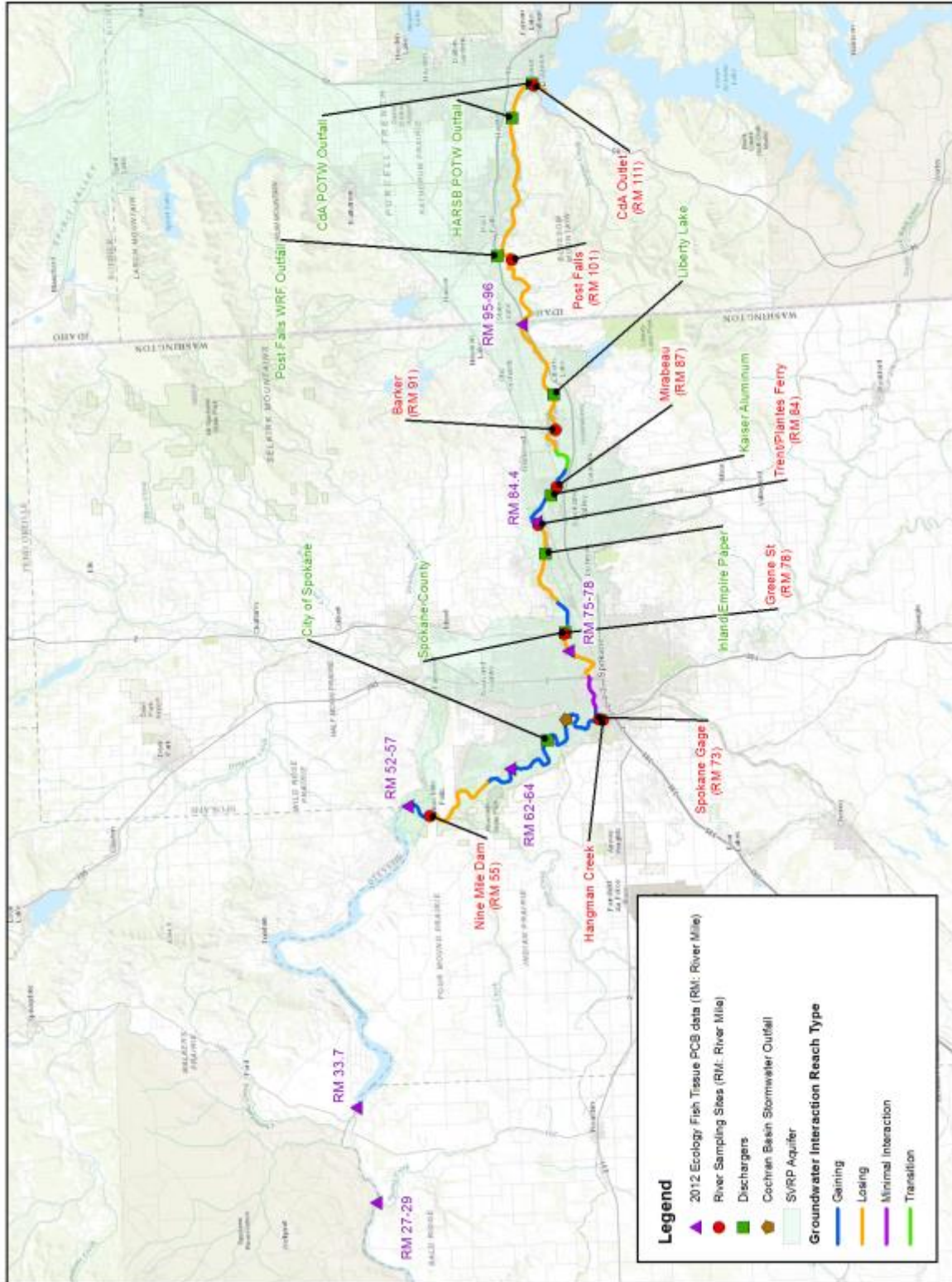
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1. LimnoTech, November 29, 2016. Prepared for the SRRTTF. Comprehensive Plan to Reduce Polychlorinated Biphenyls (PCBs) in the Spokane River.
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3. WA Department of Ecology, May 2014. Freshwater Fish Contaminant Monitoring Program, 2012 Results. Publication No. 14-03-020.
4. WA Department of Ecology, April, 2006. Persistent Organic Pollutants in Feed and Rainbow Trout from Selected Trout Hatcheries. Publication No. 06-03-017.
5. WA Department of Ecology, 2000. Results from Analyzing PCBs in 1999 Spokane River Fish and Crayfish Samples. Memorandum from A. Johnson to J. Roland.

Figures

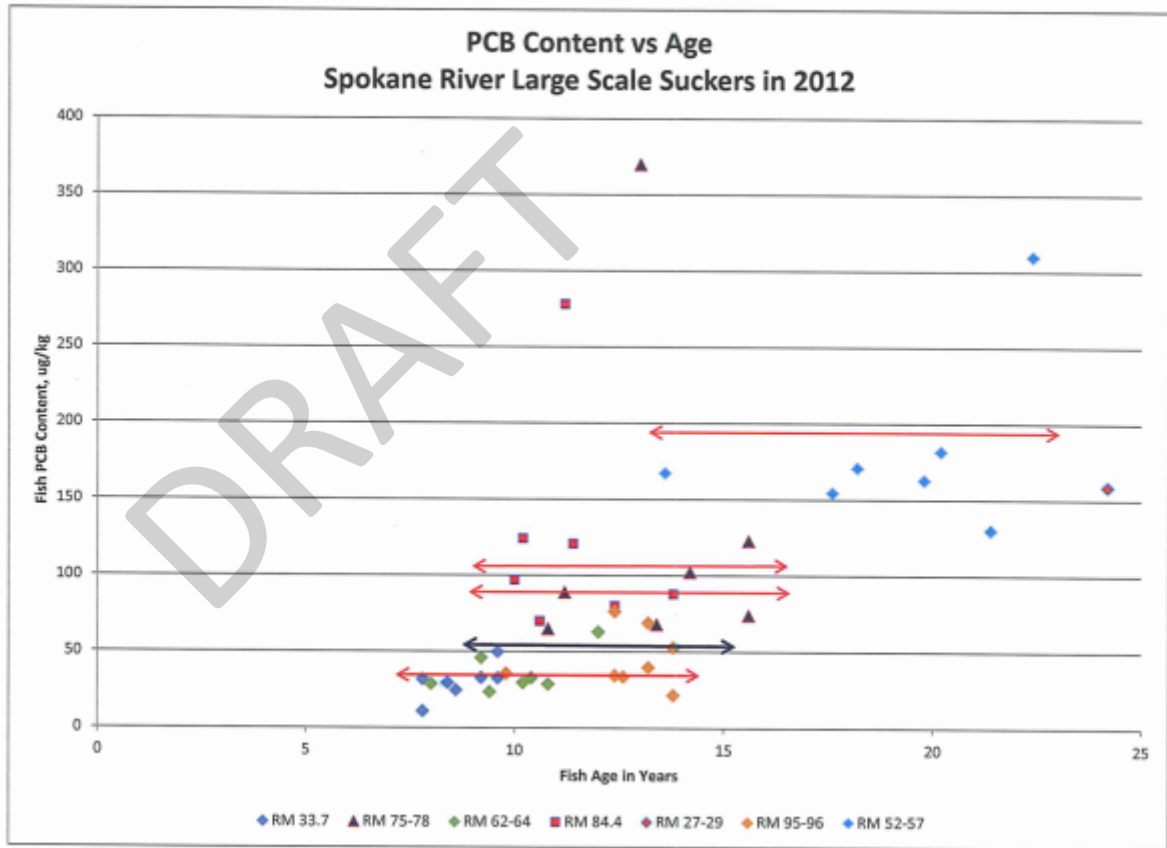
Figure 1 – Spokane River Sample Locations – Fish, Water Column, Stormwater, Wastewater

Figure 1 - SRRTTF 2014 and 2015 Synoptic Survey and 2012 Ecology Fish Tissue Sampling Locations



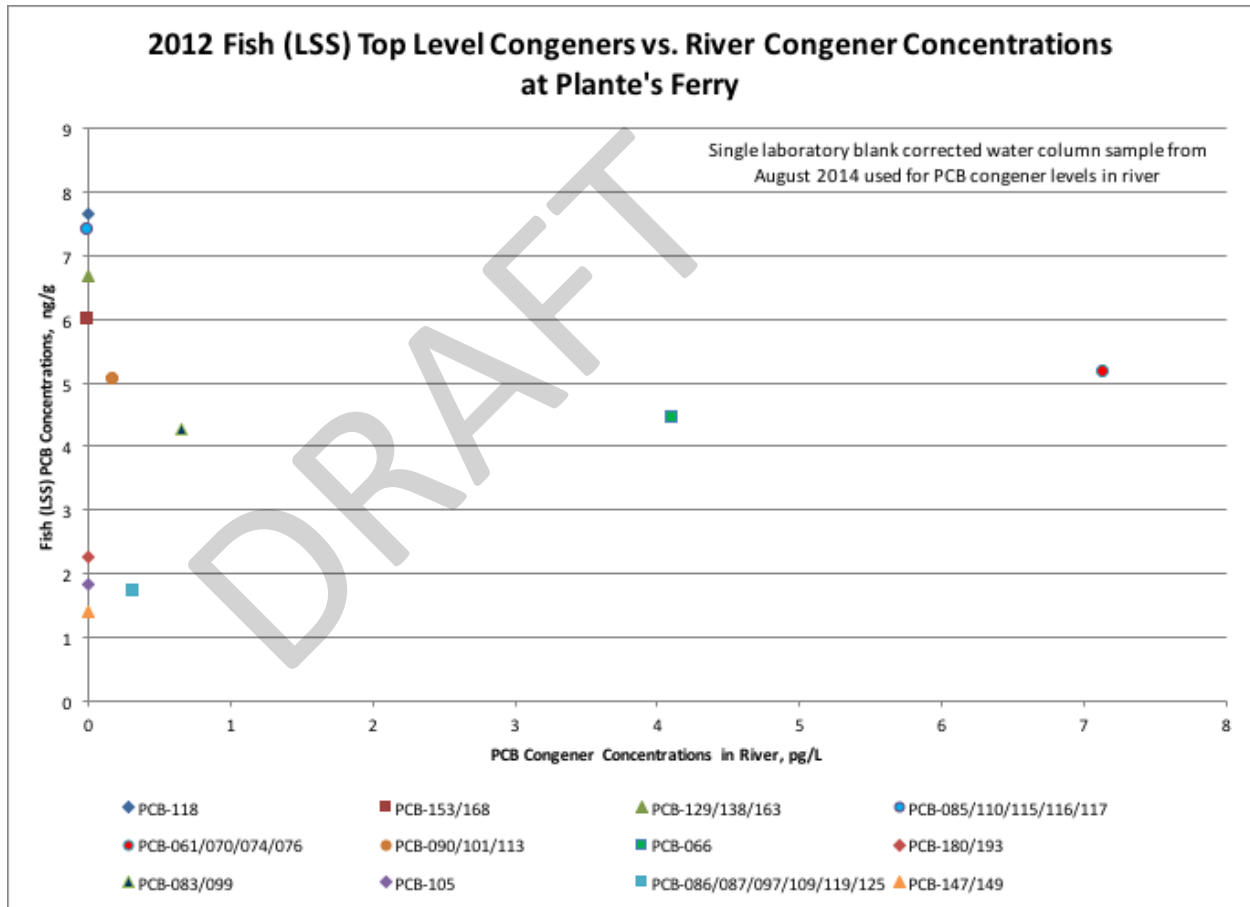
Prepared by City of Spokane RWRF Lab 3/7/2017 - For informational purposes only

Figure 2^a



^a Fish age and PCB content data from Ecology (2014).

Figure 3^b



^b Fish data from Ecology (2014) and associated congener level data provided by Keith Seiders, WA Department of Ecology (email communication on May 4, 2015). Water column concentrations from SRRTF synoptic river sampling event on August 14, 2014 .