

SRRTTF PMF Project Phase I – Blank Influence Analysis  
Summary of Workgroup Conference Call on October 4, 2018

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## Overview

The overall goal of this project is to conduct a PMF analysis of PCB data associated with the Spokane River. As we know water column samples for the Spokane River have very low PCB concentrations and are often within the same range as laboratory method blanks and field blanks. There are various ways to correct low level PCB data to try and account for the potential introduction of PCB's during sampling and analysis. The choice of a blank correction method can have a significant impact on the corrected results. Phase I of this project is to do a PMF analysis on a set of environmental samples using multiple blank correction methods to determine if a blank correction method with the least bias can be identified.

The scope of work includes consultation with the SRRTTF on the choice of blank correction methods. There are many permutations of correction methods, types of blanks, and sample groupings. Below are the methods that were discussed and agreed to by the workgroup:

### Censoring at 3x, 5x, 10x

Values to censor by:

- Batch specific method blank
- Sampling day/group specific travel/trip blank
- Batch specific max on a per congener basis of method blank and trip blank
- Average of all method blanks in associated study (studies are 2014 synoptic, 2015 synoptic, 2016 monthly)
- Average of all travel/trip blanks in associated study
- Average of all blanks in associated study

### Subtraction:

Values to subtract from result:

- Batch specific method blank
- Sampling day/group specific travel/trip blank
- Max on a per congener basis of batch specific method blank and sampling day/group travel/trip blank
- Average of all method blanks in associated study (studies are 2014 synoptic, 2015 synoptic, 2016 monthly)
- Average of all travel/trip blanks in associated study
- Average of all blanks in associated study

There are some issues with the data sets that do not allow a clean implementation of methods. The work group discussed each and agreed to the following approach for each one:

1. Three batches have 3 method blanks rather than one.

*The method blanks will be averaged for each batch and the average will be used in the correction method consistent with Limnotech's treatment of the data in the associated report.*

2. It is not clear if there is a difference between the trip blanks and field blanks. Also, some of the trip blanks were never in the field, just bottle blanks in the lab. A cursory review of the data do not show significant differences between the different types of blanks that are not method blanks (field/trip/bottle).

*The field, trip, and bottle blanks will be grouped for the applicable blank correction methods.*

3. The samples collected on 3/24/2016 and 12/13/2016 were rerun due to high method blank contamination. The field blanks for those days were not rerun.

*The samples collected on those days will be excluded from the day/group specific trip/field blank correction method.*

Dr. Rodenburg also seeks Task Force inputs on the following:

**Non-Detect Treatment:**

The PMF analysis does not allow use of zero. Often half the limit of detection (LOD) is used when there is a non-detect. If the data include many non-detects with the same LOD, the analysis could detect this as a pattern. Dr. Rodenburg suggests using a random number generator to assign a concentration between zero and  $\frac{1}{2}$  the LOD for all non-detects used in the PMF analysis. The workgroup concurred with this suggestion.

**Inclusion of Effluent Samples:**

The studies to be considered in phase I include both Spokane River water column samples and effluent samples. The effluent samples range from values in the same range as river samples to over 4,000 pg/L. Dr. Rodenburg is concerned that inclusion of high concentration effluent samples may mask the influence of blank correction on water column samples. The workgroup recommends that all effluent samples be excluded from the blank influence analysis.

**Next Steps:**

- Spokane County is providing blank corrected results to Dr. Rodenburg, and she will conduct the phase I analysis. Anticipated completion date for phase I is 1/1/19.
- A draft phase I analysis report will be provided to the SRRTTF for review. The report will include a recommendation for a blank correction method to be used in the phase II analysis.
- The PMF Workgroup and Dr. Rodenburg will develop the scope of the phase II analysis, including the samples to be included in the PMF analysis.