

**Spokane River Regional Toxics Task Force
Administrative and Contracting Entity
(SRRTTF-ACE)**

**Professional Service Contract
No. 002-17**

Contract between:

SRRTTF-ACE
PO Box 3965
Spokane, WA 99220-3965
(hereinafter called "Owner")

Date: March 31, 2017

and:

LimnoTech, Inc.
501 Avis Drive
Ann Arbor, MI 48108
(hereinafter called "Supplier")

Owner and Supplier agree that as of the above date Supplier shall furnish all the necessary labor, equipment, and materials, other than the Owner-furnished services and materials specified, to perform all obligations set forth in this Contract and in the documents listed below, which documents are incorporated herein by reference and, together with this Contract, may herein after be referred to collectively as "Contract Documents".

Supplier shall provide technical support services in accordance with the attached Specification.

DOCUMENTS:

- Specification No. 002-17, Scope of Work, dated March 23, 2017
- Specification No. 002-17, Budget and Schedule, dated March 23, 2017
- SRRTTF-ACE General Conditions for Professional Services Contracts
- Per Diem Rate Schedule

COMPENSATION:

Total potential compensation is not to exceed \$46,800. Compensation is not to exceed \$36,800 without additional written scope and authorization. Compensation is on a T&M basis at the rates on the attached rate schedule.

The amount above includes all present and future taxes imposed by Federal, State, and local governments which are applicable to the Work.

SCHEDULE:

Starting Date: March 31, 2017

Completion Date: December 31, 2017

Supplier: LimnoTech, Inc.	Owner: SRRTTF-ACE
By:	By:
Print:	Print:
Title:	Title:
Phone:	Phone:
Email:	Email:

SRRTTF-ACE
Specification No. 002-17
March 23, 2017

Technical Consultant Support to Spokane River Regional Toxics Task Force
2017 Technical Activities
Scope of Work

This document describes the activities to be conducted in support of the Spokane River Regional Toxics Task Force (SRRTTF) in their implementation of the Comprehensive Plan to Reduce PCBs in the Spokane River.

Work will be conducted through four tasks:

1. Develop Quality Assurance Project Plan (QAPP)
2. Reach by Reach Homolog-Specific Mass Balance Calculations
3. Compilation of Available Groundwater Data and Comparison to Homolog-Patterns of Suspected Groundwater Loads
4. Continuing Task Force Support

Each task is described below.

Task 1: Quality Assurance Project Plan

Supplier will prepare a Quality Assurance Project Plan (QAPP) that describes the quality procedures, criteria and corrective actions associated with the analysis program conducted in the tasks described below. The QAPP will be the basis for ensuring the type and quality of environmental data and information needed for a specific decision and that the quantity and quality objectives of EPA's Quality System (EPA, 2001; Requirements for Quality Assurance Project Plans, EPA QA/R-5) are met. The purpose of the QAPP is to assure that calculations, evaluations, and decisions completed or deduced based on the results of the monitoring activities are accurate, appropriate, and consistent with the objectives of the water quality monitoring activities.

The QAPP will be prepared as an update to the existing QAPP for SRRTTF PCB investigations (LimnoTech, 2016; http://srrttf.org/wp-content/uploads/2016/06/QAPP_addendum2_final_022916.pdf). The original QAPP for SRRTTF field monitoring was prepared in 2014 to address studies conducted that year. The QAPP was revised in 2015 to cover additional sampling conducted in August 2015. A second revision was prepared to address the monthly water quality sampling conducted in 2016. This revision will define the specific objectives of the 2017 technical analyses, and describe the quality of data needed to satisfy these objectives.

Deliverables:

- Draft QAPP

- Interim QAPP/SAPP, incorporating feedback from SRRTTF
- Final QAPP/SAPP, incorporating feedback from Ecology

Task 2: Reach by Reach Homolog-Specific Mass Balance Calculations

Mass balance analyses on total PCB concentrations as described in the in the 2014 and 2015 Technical Activities Reports were sufficient to identify the presence of a groundwater PCB source to the Spokane River between Barker Rd. and Trent Avenue/Plante's Ferry. Subsequent mass balance analyses conducted on a homolog-specific basis identified a potential additional groundwater PCB source below Plante's Ferry. The purpose of this task is to conduct homolog-specific mass balance analyses on the remaining river reaches to determine the presence of other potential sources, and to calculate homolog distributions for any identified sources. LimnoTech will conduct mass balance analyses similar to those contained in the 2014 and 2015 Technical Activities Reports, but will modify those analyses to provide results by reach on a homolog-specific basis rather than the total PCB basis contained in the prior analyses. The homolog distributions calculated for the inferred groundwater loads will be compared to homolog distributions observed in groundwater and calculated as part of Task 3. This task will include processing all of the 2014 data to generate blank-corrected homolog distributions for river and effluent samples (blank-corrected homolog distributions have already been generated for the 2015 data).

In addition, a more refined homolog-specific analysis will be conducted for the Plante's Ferry to Greene St. segment, as this segment contains both gaining and losing sections. The original homolog-specific analysis considered only the net exchange of groundwater, instead of independently assessing the gaining and losing portions. That analysis demonstrated that this section of the river gained certain homologs and lost others, but was not suitable for generating a homolog pattern for the suspected new source. The refined analysis to be conducted for this task will divide the reach into two segments: 1) The losing section from Plante's Ferry to just downstream of Upriver Dam, and 2) The gaining section from just downstream of Upriver Dam to Green St. Groundwater additions and losses for these sections will be based upon flow measurements conducted by USGS below Upriver Dam for Spokane County in September, 2015 as well as results from the Ground-Water Flow Model for the Spokane Valley-Rathdrum Prairie Aquifer.

By parsing out the loss of river PCB to groundwater prior to the consideration of PCBs being added in the gaining section, this new analysis will generate a homolog distribution for the new groundwater loading source. This refined analysis is consistent with the work described in Section 5.14.1 of the Comprehensive Plan.

Deliverables:

- Draft technical memorandum, documenting homolog-specific mass balance analyses
- Presentation of draft results at Technical Track Work Group or Task Force meeting
- Final technical memorandum, revised in response to comments from Task Force

Task 3: Compilation of Available Groundwater Data and Comparison to Homolog-Patterns of Suspected Groundwater Loads

This task consists of identifying, compiling, and assessing all relevant groundwater PCB data, with the ultimate objective of comparing homolog distributions from suspected groundwater sources to homolog patterns observed in groundwater. This task also includes QA/QC validation of recent sets of groundwater data collected by Ecology/Spokane County as outlines in the existing QAPP. Supplier will compile all available Spokane-area groundwater PCB data analyzed using Method 1668 from Kaiser, Urban Waters, Ecology, and Spokane County and will analyze the data to report the following features for each measurement:

- Blank Corrected Total PCB Concentrations
- Blank Corrected Congener Levels
- Blank Corrected Homologue Levels
- Collection Dates, Collection Method, Analytical Method, Location
- Ten Most Prevalent Congeners by Concentration
- D/F Like Congener Concentrations

The resulting groundwater homolog distributions will be compared to the homolog distributions for the unknown loads generated in Task 2, using accepted fingerprinting techniques (e.g. cosine theta method) to identify similarities in patterns and aid in identifying which groundwater sources may be contributing to the observed increase in river concentration.

Deliverables:

- Draft technical memorandum, documenting comparison of homolog patterns in back-calculated groundwater load to homolog patterns in groundwater sources.
- Presentation of draft results at Technical Track Work Group or Task Force meeting
- Final technical memorandum, revised in response to comments from Task Force

Task 4: Continuing Task Force Support

Supplier will participate by phone in all monthly Task Force and Technical Track Work Group meetings (Task 4a). In addition, as-needed technical support will be provided in response to requests from the Task Force (Task 4b). Potential activities identified under Task 4b include co-ordination with the SRRTTF database contractor.

SRRTTF-ACE
Specification No. 002-17
March 23, 2017

Technical Consultant Support to Spokane River Regional Toxics Task Force
2017 Technical Activities
Budget and Schedule

BUDGET

Task	Task Description	Budget
1	Revise QAPP	\$2,000
2	Reach by Reach Homolog-Specific Mass Balance Calculations	\$9,000
3	Compilation of Available Groundwater Data and Comparison to Homolog-Patterns of Suspected Groundwater Loads	\$15,000
4a	Continuing Task Force Support	\$10,800
4b	Unspecified Technical Support (Requires additional written scope and authorization)	\$10,000
Total		\$46,800

SCHEDULE

Task	Task Deliverable	Completion Date
1	Revised QAPP	05/31/17
2	Draft memorandum on homolog-specific mass balance analyses	06/28/17
	Presentation to Task Force on homolog-specific mass balance analyses	06/28/17
	Final memorandum on homolog-specific mass balance analyses	07/26/17
3	Draft memorandum comparing homolog patterns in unknown loads to homolog patterns in groundwater sources.	07/26/17
	Presentation to Task Force on comparison of homolog patterns in unknown loads to homolog patterns in groundwater sources	07/26/17
	Final memorandum comparing homolog patterns in unknown loads to homolog patterns in groundwater sources.	08/30/17
4	Continuing Task Force support	12/31/17