**DRAFT FOR TECHNICAL TRACK WORK GROUP REVIEW 08/07/2013**

**Memorandum**

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| **From:** Tim Towey, Kat Ridolfi, Dave Dilks | **Date:** August 2, 2013 |
| **Project:** SRRTTF |
| **To:** Spokane River Regional Toxics Task Force | **CC:**  |
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**SUBJECT: Review and Evaluation of Existing Data**

Summary

The Spokane River Regional Toxics Task Force (SRRTTF) is developing a comprehensive plan to reduce toxic pollutants in the Spokane River, and has hired LimnoTech to serve as a technical advisor. Initial tasks in this support included identification and collection of available data to define existing PCB and dioxin sources and sinks. This memorandum documents the efforts corresponding to Task 5: Data Review and Evaluation. The intent of this task is to evaluate the quality and credibility of the available data relative to satisfying the identified .data needs, and to store the resulting data in a database facilitating its use later in the project.

Approximately 45 data sets were obtained. All data were reviewed to determine whether they met data quality objectives. The data that were gathered for this project were collected under a wide range of QA/QC procedures. A graded approach was taken with the data review, with data quality divided into categories ranging from “highest quality, fully acceptable for subsequent use” to “lesser quality, suitable only for supporting ‘weight of evidence’ approaches”. All relevant data collected during Task 2 were evaluated and stored in a Microsoft Access data base, which is now being provided to the SRRTTF.

The remainder of this memorandum summarizes the data sources obtained, the database in which the data are stored, and the QA/QC review that was given to these data.

Data Sources

A June 19 memorandum, “Status Report on Data Gathering Activities” reported on progress made to obtain data from potential sources. Our recent work has consisted gathering and evaluating that data for quality and applicability to the project.

For the data gathering portion of the project, the following agencies and companies were contacted:

* Washington State Department of Ecology
* City of Post Falls, ID
* City of Spokane
* Spokane County
* Spokane Regional Clean Air Agency
* Kaiser Aluminum
* Inland Power
* Avista Power
* Inland Empire Paper
* City of Liberty Lake
* USGS
* Washington State Department of Transportation

Since the June 19 data gathering status report memo was submitted, some new data were obtained. These data include stack reports for the Kaiser Aluminum and Spokane Waste to Energy plants (from the Spokane Regional Clean Air Agency) and PCB monitoring and flow data from the Inland Empire Paper plant. With these new additions, data from most of the categories listed in the Data Request Memo (April 17, 2013) have been obtained. These categories currently include:

* Climate data
* Commercial buildings constructed between 1950 and 1980
* Identified contaminated sites
* Illegal dumping/spills
* Number and size of smelters and incinerators
* Number of Vehicle Registrations
* Numbers and sizes of auto dismantlers, computer and electronics recyclers, transfer stations, landfills, metal recyclers, and white goods recyclers
* PCB and Dioxin emissions from incineration activities
* PCBs and PCDD/Fs in CSOs
* PCBs in fish tissue
* PCBS in groundwater
* PCBs in sediment
* PCBs in soil
* PCBs and Dioxins in stormwater
* Spokane River and tributary water column measurements (e.g., temperature)
* Stormwater loads
* Stream flow information for Spokane River and tributaries
* Wastewater treatment plant loads
* Water column measurements of PCB and dioxin concentrations
* Wastewater treatment plant loads

Some data categories we decided not to pursue due to either a high level of effort to get the necessary information from available data, or due to a finding that the source does not exist in the watershed include:

* Fire fighting reports
* Number and size of demolition sites
* Yard waste burning studies
* Number and size of petroleum refineries

Database Description

Analytical data in the SRRTTF Access database is stored in a format consistent with the data in the Environmental Information Management (EIM) system of the Washington State Department of Ecology. Specifically, the Location, Result, Sample\_Method, Study, Well\_Location, and Well\_Measuring\_Point table designs from the EIM have been incorporated directly into the SRRTTF database. Additional analytical data was processed to be consistent with this database structure.

Several additional tables were added to store the various types of data collected as part of the SRRTTF data acquisition:

* WWTP\_data - An additional table was generated to store results from the wastewater treatment plants. These were samples of influent, effluent, and sewer system samples. Results from the City of Spokane, Kaiser Aluminum, and Liberty Lake were formatted to be consistent with a results table received from the County via Brown and Caldwell.
* USGS\_flow – US Geologic Service stage and flow data from five gages in the Spokane River Valley.
* NCDC\_Spokane\_Airport – National Climatic Data Center climate data from the Spokane Airport
* PCB\_sites – PCB sites identified by personnel at the Washington Department of Ecology
* ERTS\_queries – Reported spills based on queries of Ecology’s Environmental Reporting Tracking System
* City\_of\_Spokane\_CatchBasin\_PCBdata– this data is currently being stored in a separate table; however, these results may be added to the main Results table following further coordination with the City to fill in required fields.

Hard copy information sources (such as reports, scientific literature, and stack emission records) are stored outside of the database, but the Data\_Sources table in the SRRTTF database provides descriptions of, and links to, the sources. These links are stored as relational paths so the database and associated documents can be transferred among various computers and networks while maintaining functionality. Data sources that are GIS based, such as SSURGO data and aerial photos, have not been linked to the Access database at this point.

The iteration of the database that is being transmitted as part of this deliverable represents a “snapshot in time.” New sources of data continue to trickle in and results that are obtained as part of the SRRTTF monitoring effort will be added to the database. This version of the database is primarily intended as a resource to assist with the identification of current data gaps. As data gaps are identified, additional sources of information may be located and added to the database.

Data Review

The data review sub-task consisted of reviewing the data obtained so far in order to evaluate their quality and credibility with respect to satisfying project data needs. The goal of this project is development of development of a comprehensive plan for controlling toxic pollutants in the Spokane River. Secondary data (i.e., previously collected or reported data) will be used for the purposes of estimating the magnitude of pollutant load generated from a range of source categories in the Spokane River watershed, and defining the relationship between pollutant load and resulting concentrations in the Spokane River.

The data quality objectives and associated criteria for the secondary data used for this project are as follows:

1. Data are from a known and reliable source
2. Data are appropriate for the intended use
3. Data are of known quality

Data sources were primarily supplied by SRRTTF members and previously vetted in the “Status Report on Data Gathering Activities,” and all fall under the category “Known and Reliable”. The appropriateness of data for the intended was assessed using the following criteria:

* data satisfy project objectives;
* data satisfy evaluation and modeling requirements;
* data exhibit appropriate characteristics (e.g., quality, quantity, temporal, spatial); and
* data were generated using appropriate methods.

The process followed for identifying data sources largely pre-screened all data as being appropriate.

A graded approach was taken towards assessing data quality, with each dataset was assigned a data quality code a-d as follows:

1. data were generated under an approved QAPP or other sampling document;
2. data were not generated under an approved QAPP, but include quality assurance statements/descriptions/qualifiers and/or associated QC data that allows evaluation for precision, bias, representativeness, completeness, comparability and/or sensitivity;
3. data come from peer-reviewed publications; and
4. data quality is limited or unknown, but come from a reliable source.

Category a data are considered the highest quality, and fully acceptable for subsequent use, while the lesser category data will be used primarily for supporting ‘weight of evidence’ approaches.

Additional Quality Control procedures were conducted on all Category B data, as well as all Category A that had not been assessed for blank contamination. Samples associated with elevated method blank levels were flagged. During the data gap analysis, a sensitivity analysis will be performed to assess the influence of these flagged results.

Data were also flagged according to laboratory methodology. Specifically, datasets that contain only Aroclor results rather than congener specific values were flagged. These datasets will be used as a line of evidence, but will not be given the same weight as the datasets with congener specific values.

Table 1 summarizes the data review decisions for each dataset.

Table 1. SRRTTF Dataset Acquisition and Review Summary.

| **Item Number** | **Data Category** | **Dataset** | **Data Source (agency)** | **Reliable Source** | **Data Quality Category** | **Aroclor Only Flag** | **Data Appropriateness** | **Quality/Appropriateness Notes** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | PCBs in stormwater | Catch Basin sediment PCBs | Lynne Schmidt (City of Spokane Wastewater Management) | x | a |  | Appropriate | QAPP with data validation requirements |
| 2 | PCBs in stormwater | Oil samples PCBs content | Lynne Schmidt (City of Spokane Wastewater Management) | x | a |  | Appropriate | QAPP with data validation requirements |
| 3 | Emissions from smelters | Kaiser Aluminum emissions | April Westby (Spokane Regional Clean Air Agency) | x | b |  | Appropriate | Currently in hard copy only |
| 4 | Illegal dumping/spills | ERTS queries | Mike Hepp (Ecology) | x | d |  | Appropriate | Not analytical data |
| 5 | Illegal dumping/spills | Spills reported  | Charlene Holbrook (Post Falls Police Department) | x | d |  | Appropriate | Not analytical data |
| 6 | Number of Vehicle Registrations | Vehicle Registrations | Susan Mitchell (Dept of Licensing) smitchell@dol.wa.gov 360-359-4007 | x | d |  | Appropriate | Not analytical data |
| 7 | Numbers and sizes of auto dismantlers, computer and electronics recyclers, transfer stations, landfills, metal recyclers, and white goods recyclersNumber and size of smelters, refineries, and incineratorsIdentified contaminated sites, cleaned up sites with residual concentrations | SITES database  | Downloaded information from SITES database, Ginny Darrel provided identification of PCB sites | x | d |  | Appropriate | Not analytical data |
| 8 | PCB and Dioxin emissions from incineration activities | Municipal incinerator (for County) | April Westby (Spokane Regional Clean Air Agency) | x | b |  | Appropriate | Check for QAPP |
| 9 | PCBs in caulk | PCBs in various building materials in U.S. | (USEPA) | x | c |  | Appropriate | Mix of peer-reviewed literature and agency reports |
| 10 | Residential home wood burning | Home Wood Burning | April Westby (Spokane Regional Clean Air Agency) | x | d |  | Appropriate | Not analytical data |
| 11 | River bed sediment PCB concentrations | Upriver Dam cap sediment cores | Brendan Dowling (Ecology) | x | a |  | Appropriate | Consistent with Ecology data in EIM |
| 12 | Spokane River and tributary water column measurements | Spokane River Temperature Profile, Barker Road to Plants Ferry Park | Guy Gregory (Washington State Department of Ecology; Water Resources Division) | x | c |  | Appropriate | Agency-produced document |
| 13 | Geomorphic data | Cross-section of Spokane River from State line to Potach Hill | Guy Gregory (Washington State Department of Ecology; Water Resources Division) | x | d |  | Appropriate | Unsure of source document |
| 14 | Groundwater /surface water data | Surface-water/Ground-water Interaction of the Spokane River and the Spokane Valley/Rathdrum Prairie Aquifer, Idaho and Washington | Guy Gregory (Washington State Department of Ecology; Water Resources Division) | x | c |  | Appropriate |   |
| 15 | Groundwater /surface water data | Gravity Acquisition and Depth to Basement Modeling of the Spokane Valley and Rathdrum Prairie Aquifer | Guy Gregory (Washington State Department of Ecology; Water Resources Division) | x | c |  | Appropriate |   |
| 16 | Groundwater /surface water data | Assessment of Areal Recharge to the Spokane Valley-Rathdrum Prairie Aquifer | Guy Gregory (Washington State Department of Ecology; Water Resources Division) | x | c |  | Appropriate |   |
| 17 | Stormwater loads | Urban Waters Program | Arianne Fernandez (Ecology) | x | a |  | Appropriate | Data verification requirements included in QAPP |
| 18 | Stream flow information for Spokane River and tributaries | Data for gages 124190000, 12422500, 12424000, 12431000, 12433200  | USGS | x | a |  | Appropriate |   |
| 19 | Wastewater treatment plant loads | Kaiser Aluminum outfall study | Bud Leiber (Kaiser Aluminum) | x | a |  | Appropriate | Data verification requirements included in QAPP |
| 20 | Wastewater treatment plant loads | City of Spokane Treatment Plant | Ellie Key (Washington Department of Ecology; Eastern Regional Office (Spokane)) | x | a |  | Appropriate | Data verification requirements included in QAPP |
| 21 | Wastewater treatment plant loads | Liberty Lake Sewer and Water District | Ellie Key (Washington Department of Ecology; Eastern Regional Office (Spokane)) | x | a |  | Appropriate | Data verification requirements not included in QAPP, data includes appropriate data quality flags |
| 22 | Wastewater treatment plant loads | Spokane County effluent flows and PCB results | Ellie Key (Washington Department of Ecology; Eastern Regional Office (Spokane), Rob Lindsay (Spokane County)-EDD | x | a |  | Appropriate | Data verification requirements included in QAPP |
| 23 | PCBs in fish tissue | Washington State Toxics Monitoring Program: Exploratory Monitoring 2006. | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 24 | PCBs in fish tissue | 1999 Spokane River fish and crayfish PCB'S and METALS | Ecology--Downloaded from EIM | x | b | x | Appropriate | EIM note: Level 4 - Data Verified and Assessed for Usability in a Formal Study Report.Limited congener data available. |
| 25 | PCBs in stormwater/Water column measurements of PCB and dioxin concentrations | Spokane River PCB and Source Survey, August 2000 | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 26 | PCBs in fish tissue | Metals and PCBs in Long Lake Fish | Ecology--Downloaded from EIM | x | b |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 27 | Wastewater treatment plant loads | Spokane Area Point Source PCB Survey, May 2001 | Ecology--Downloaded from EIM | x | b |  | Appropriate | EIM note: Level 4 - Data Verified and Assessed for Usability in a Formal Study Report |
| 28 | PCBs in stormwater | Spokane River PCB TMDL Stormwater Analysis | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 29 | PCBs in fish tissue | Washington State Toxics Monitoring Program: Exploratory Monitoring 2005. | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 30 | PCBs in fish tissue | Washington State Toxics Monitoring Program: Exploratory Monitoring 2008. | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 31 | PCBs in soilPCBS in groundwater | Kaiser Trentwood Remedial Investigation, Spokane, WA | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 32 | PCBs in fish tissue | Washington State Toxics Monitoring Program: pre-QAPP Trend Monitoring | Ecology--Downloaded from EIM | x | a |  | Appropriate | EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report |
| 33 | PCBs in stormwater | Pilot Study to Evaluate the Performance of a Prototype Stormwater Particulate Sampling Device | Ecology--Downloaded from EIM | x | b |  | Appropriate | EIM note: Level 4 - Data Verified and Assessed for Usability in a Formal Study Report |
| 34 | PCBs in sediment | Upriver Dam PCB Sediments Site  | Ecology--Downloaded from EIM | x | b | x | Appropriate | EIM note: Level 2 - Data Verified |
| 35 | PCBs in fish tissuePCBs in sediment | 1989 BWMP FISH TISSUE AND SEDIMENT | Ecology--Downloaded from EIM | x | b | x | Appropriate | EIM note: Level 4 - Data Verified and Assessed for Usability in a Formal Study Report |
| 36 | Wastewater treatment plant loads | Riverside Park WWTP PCB, TCDD, and PBDEs | Lynne Schmidt (City of Spokane Wastewater Management) | x | a |  | Appropriate | Data verification requirements included in QAPP |
| 37 | Commercial buildings constructed between 1950 and 1980 | U.S. Census Statistical Abstracts | US Census Bureau | x | a |  | Not appropriate | Limited to City of Spokane - does not discriminate between residential and commercial construction |
| 38 | Wastewater treatment plant loads | IEP Effluent PCB | Inland Empire Paper (Doug Krapas) | x | b |  | Appropriate | No QAPP, QA samples available |
| 39 | PCBs and PCDD/Fs in stormwater/CSOs | Spokane River Source Tracing | Ecology--Arianne Fernandez | x | a |  | Appropriate | Collected under Ecology QAPP |
| 40 | Climate data | Precipitation, air temperature, solar radiation, wind speed, other information | National Weather Service - downloaded from National Climatic Data Center | x | a |  | Appropriate | Available quality control documentation |
| 41 | Soil characteristics | Soil Survey Geographic (SSURGO) Data | Natural Resources Conservation Service | x | a |  | Appropriate | Available quality control documentation |
| 42 | CE-QUAL-W2 water quality model | CE-QUAL-W2 water quality model | Obtained prior to project initiation | x | d |  | Appropriate | Uncertain if modeling QAPP is available |
| 43 | Railroad locations | Spokane County Road Data | Downloaded from county website | x | d |  | Appropriate | Unknown QAQC procedures |
| 44 | Tributary watershed boundaries | National Hydrography Dataset | Downloaded from NHD webpage | x | d |  | Appropriate | Unknown QAQC procedures |
| 45 | Degradation rates in bed sediments | Scientific literature | Applied and Environmental MicrobiologyEnvironmental Health Perspectives | x | c |  | Appropriate | Peer-reviewed publications |