

Memorandum

From: Tim Towey, Kat Ridolfi, Dave Dilks **Date:** August 15, 2013
To: Spokane River Regional Toxics Task Force **Project:** SRRTTF
CC:

SUBJECT: Review and Evaluation of Existing Data - Revised

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 4 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, 2013 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 Utilities
- Inland Empire Paper
- Liberty Lake Sewer and Water District
- USGS
- Washington State Department of Transportation

Since the June 19, 2013 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 PCDD/F 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 PCDD/Fs 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 PCDD/F concentrations

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 Sewer and Water District were formatted to be consistent with a results table received from Spokane 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 will be added to the main Results table after further processing.

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 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:

- A. data were generated under an approved QAPP or other sampling document;
- B. 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;
- C. data come from peer-reviewed publications; and
- D. 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	Stormwater	Lynne Schmidt (City of Spokane Wastewater Management)	x	A		Appropriate	QAPP with data validation requirements
3	PCBs in stormwater	Oil samples PCBs content	Lynne Schmidt (City of Spokane Wastewater Management)	x	B		Appropriate	No QAPP
4	Emissions from smelters	Kaiser Aluminum emissions	April Westby (Spokane Regional Clean Air Agency)	x	B		Appropriate	Currently in hard copy only
5	Illegal dumping/spills	ERTS queries	Mike Hepp (Ecology)	x	D		Appropriate	Not analytical data
6	Illegal dumping/spills	Spills reported	Charlene Holbrook (Post Falls Police Department)	x	D		Appropriate	Not analytical data
7	Number of Vehicle Registrations	Vehicle Registrations	Susan Mitchell (WA Dept of Licensing) smitchell@dol.wa.gov 360-359-4007	x	D		Appropriate	Not analytical data



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8	<p>Numbers and sizes of auto dismantlers, computer and electronics recyclers, transfer stations, landfills, metal recyclers, and white goods recyclers</p> <p>Number and size of smelters, refineries, and incinerators</p> <p>Identified contaminated sites, cleaned up sites with residual concentrations</p>	SITES database (Ecology)	Downloaded information from SITES database, Ginny Darrel provided identification of PCB sites	x	D		Appropriate	Not analytical data
9	PCB and Dioxin emissions from incineration activities	Municipal incinerator (City of Spokane)	April Westby (Spokane Regional Clean Air Agency)	x	B		Appropriate	Check for QAPP
10	PCBs in caulk	PCBs in various building materials in U.S.	(USEPA)	x	C		Appropriate	Mix of peer-reviewed literature and agency reports



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11	Residential home wood burning	Home Wood Burning	April Westby (Spokane Regional Clean Air Agency)	x	D		Appropriate	Not analytical data
12	River bed sediment PCB concentrations	Upriver Dam cap sediment cores	Brendan Dowling (Ecology)	x	A		Appropriate	Consistent with Ecology data in EIM
13	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
14	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
15	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	



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16	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	
17	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	
18	Stormwater loads	Urban Waters Program	Arianne Fernandez (Ecology)	x	A		Appropriate	Data verification requirements included in QAPP
19	Stream flow information for Spokane River and tributaries	Data for gages 12419000, 12422500, 12424000, 12431000, 12433200	USGS	x	A		Appropriate	
20	Wastewater treatment plant loads	Kaiser Aluminum outfall study	Bud Leber (Kaiser Aluminum)	x	A		Appropriate	Data verification requirements included in QAPP



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21	Wastewater treatment plant loads	Spokane County influent and effluent flows and PCB results	Ellie Key (Washington Department of Ecology; Eastern Regional Office (Spokane), Rob Lindsay (Spokane County))	x	A		Appropriate	Data verification requirements included in QAPP
22	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
23	PCBs in fish tissue	1999 Spokane River fish and crayfish PCBs 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.
24	PCBs in stormwater/Water column measurements of PCB and dioxin concentrations	Spokane River PCB and Source Survey, August 2000	Ecology--Downloaded from EIM	x	B		Appropriate	EIM note: Level 5 - Data Verified and Assessed for Usability in a Peer-Reviewed Study Report
25	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
26	Wastewater treatment plant	Spokane Area Point Source PCB	Ecology--Downloaded from EIM	x	B		Appropriate	EIM note: Level 4 - Data Verified and Assessed for



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	loads	Survey, May 2001						Usability in a Formal Study Report
27	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
28	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
29	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
30	PCBs in soil PCBS 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
31	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



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32	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
33	PCBs in sediment	Upriver Dam PCB Sediments Site	Ecology--Downloaded from EIM	x	B	x	Appropriate	EIM note: Level 2 - Data Verified
34	PCBs in fish tissue PCBs 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
35	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
36	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
37	Wastewater treatment plant loads	IEP Effluent PCB	Inland Empire Paper (Doug Krapas)	x	B		Appropriate	No QAPP, QA samples available
38	PCBs and PCDD/Fs in stormwater/CSOs	Spokane River Source Tracing	Ecology--Arianne Fernandez	x	A		Appropriate	Collected under Ecology QAPP



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39	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
40	Soil characteristics	Soil Survey Geographic (SSURGO) Data	Natural Resources Conservation Service	x	A		Appropriate	Available quality control documentation
41	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
42	Railroad locations	Spokane County Road Data	Downloaded from county website	x	D		Appropriate	Unknown QAQC procedures
43	Tributary watershed boundaries	National Hydrography Dataset	Downloaded from NHD webpage	x	D		Appropriate	Unknown QAQC procedures
44	Degradation rates in bed sediments	Scientific literature	Applied and Environmental Microbiology Environmental Health Perspectives	x	C		Appropriate	Peer-reviewed publications

