Spokane River Regional Toxics Task Force (SRRTTF) Polychlorinated Biphenyl (PCB) Database

User's Guide

Contents

The SRRTTF PCB Database is an ongoing project.

Database features identified in this Guide as "inactive" are currently in development. This Guide will be updated as features become active.

We appreciate your patience.

Purpose

The Spokane River Regional Toxics Task Force (SRRTTF) Polychlorinated Biphenyl (PCB) Database was created for compiling Spokane River PCB data and making it accessible to SRRTTF members and other interested users.

Database Contacts and Support

Spokane County Water Resources staff are the current keepers of the official SRRTTF PCB Database (herein, the database). Please contact the following individuals regarding any questions or concerns including but not limited to: access, revisions and updates, data entry, technical support, and training.

Database Contacts

Amy Sumner
Water Resources Project Manager
509-477-7678
ASUMNER@spokanecounty.org

Mike Hermanson
Water Resources Manager
509-477-7578
MHERMANSON@spokanecounty.org

Downloading the Database

In your computer's C-Drive, first create a file folder for the database files. Name the folder: SRRTTF PCB Database

This ensures that the front-end user interface of the database efficiently communicates with the back-end of the database that stores all the raw data, as well as the Excel templates for generating reports. This also reduces time to generate reports.

To download the SRRTTF database, go to the County's FTP site at
ftp://ftp.spokanecounty.org/SewUtil/SRRTTF%20Database/

Copy/paste all the database files (Table 1) into the SRRTTF PCB Database file folder just created on the computer's C-Drive.

Table 1. SRRTTF Database Files

| File Name	File Type	Purpose	Date Modified
PCBLinksData	Microsoft Access (.accdb)	Back-end of Database/ Data Storage	10/18/2018
PCBLinksDataSRRTTF10182018	Microsoft Access (.accdb)	Front-end of Database/ User Interface	10/18/2018
ExcelCrosstab.xlsx	Microsoft Excel (.xlsx)	Report Template/ Generating Reports	6/12/2018
ExcelTrendTemplate.xlsx	Microsoft Excel (.xlsx)	Report Template/ Generating Reports	6/12/2018
Homolog Summary.xls	Microsoft Excel (.xls)	Report Template/ Generating Reports	6/12/2018

Open the file PCBLinksDataSRRTTF10182018.accbd to access the SRRTTF Database user interface. The main page provides access to all the database features. Upon first use of the database after the initial download, check the top left corner of main page (under the PCB Data tab) to ensure you have the most recent version of the database (Figure 1). The current version is dated 10/18/2018 (note: may be different from the date in Figure 1).

Figure 1. SRRTTF Database user interface showing the location of the version date and the Navigation Pane arrows.
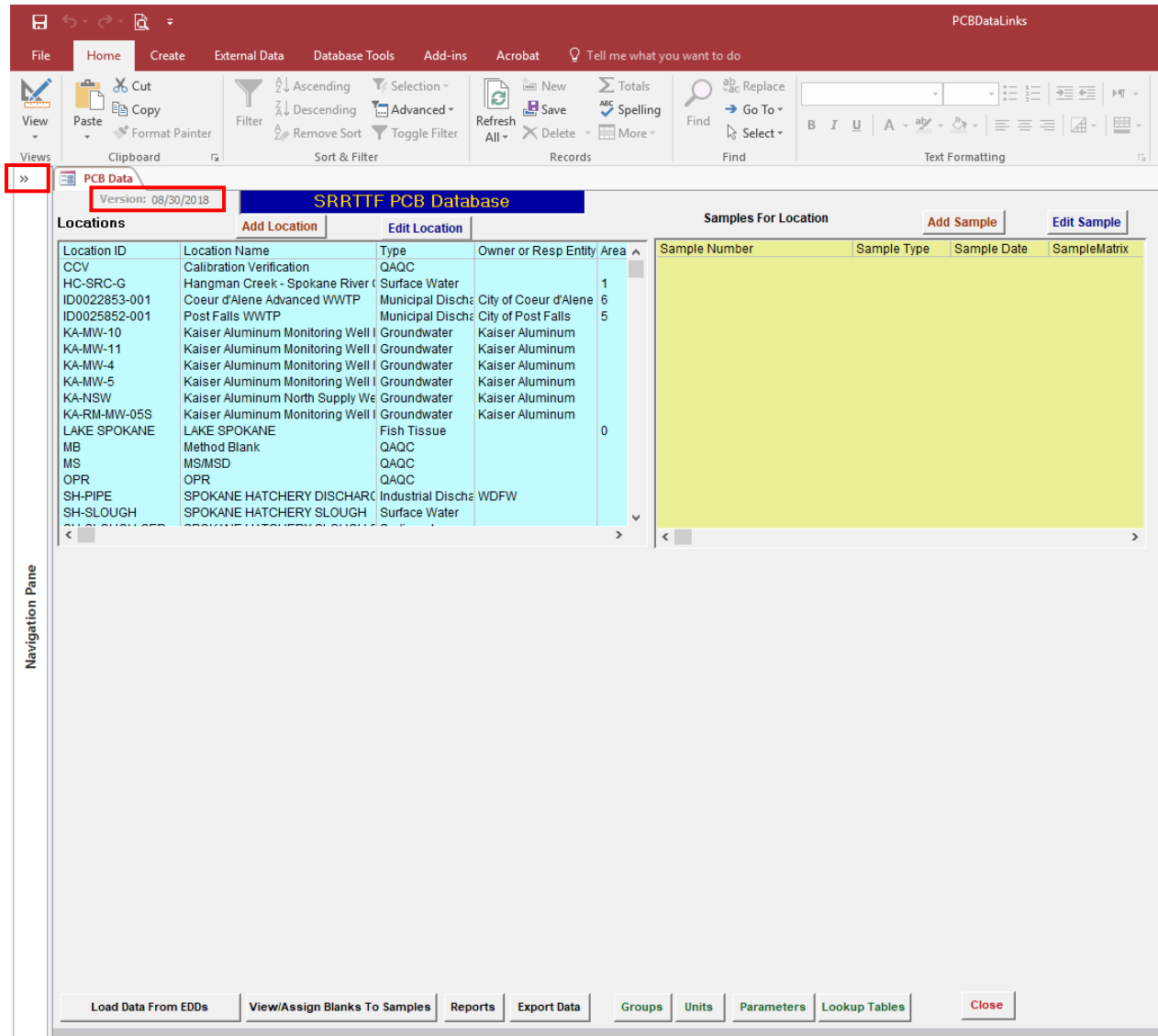
Then open the navigation pane using the arrows in the top left corner (Figure 1). Click on the LocalConnection option to run the macros that connects the front and back-end of the databases (Figure 2). This step is necessary because the database is saved to and operating from the local C-Drive. While the database may be moved to and operated from a network drive, it is not recommended. Operating from the local C-Drive will allow the database to function more efficiently, particularly when running reports. If the macros do not appear in the navigation pane, see the Troubleshooting section of this Guide.

Figure 2. Run the LocalConnection Macros by clicking on the icon when opening the database for the first time.
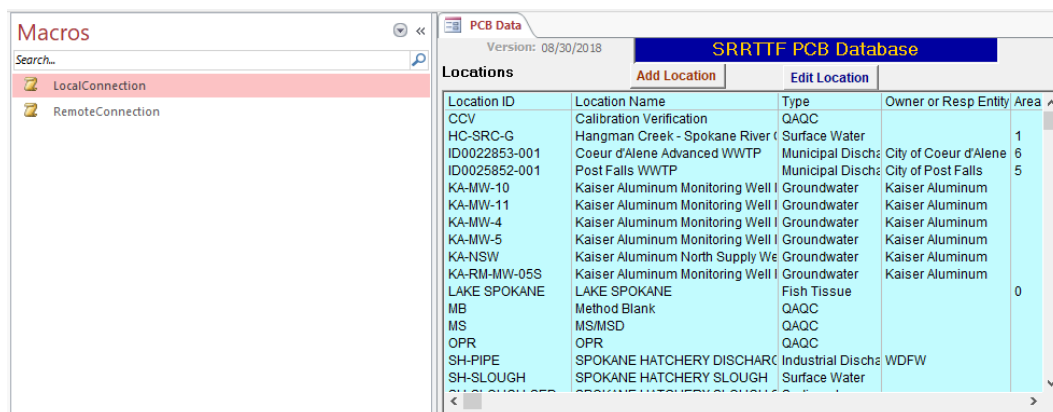
You will NOT have to repeat these steps when accessing the database from your C-Drive again, until you download a new version.

Introduction to Microsoft Access

The SRRTTF PCB Database was developed in Microsoft Access, which is a data management program included in the Microsoft Office suite of applications. Access typically employs forms for data entry, tables that are like Excel spreadsheets for data storage, and queries or reports to convey data in a meaningful manner. Data from Access can easily be imported from or exported to Excel. Database users familiar with other applications such as Word or Excel, should

This section will briefly identify and describe the Access tools useful in SRRTTF PCB Database procedures mentioned in other sections of this Guide. However, this Guide assumes some familiarity with the use of these tools as they operate in the same manner as they do in other Microsoft Office applications. If you need more detail in how to use a tool, Microsoft's website has Access training tutorials.

The tools mentioned in this Guide are found on either the Home or External Data tabs (Figure 3).

Under the Home tab, the useful tools in the Ribbon include:

Filter: allows the user to display only the database record that meet selected criteria; note that "Selection" and "Advanced" are also filter tools, and that "Toggle Filter" will switch between filtered and unfiltered records each time it is clicked on.

Sort: includes two tools, "Ascending" and "Descending," which allows the user to arrange the database records in alphabetical or numeric order in an ascending (A to Z) or descending (Z to A) manner; the "Remove Sort" tool will clear the sorting mechanism.

Refresh All: allows user to refresh displayed database records after making changes.

New: allows the user to create a new database record; note that the SRRTTF PCB Database will have more obvious buttons for creating new records and either option is acceptable to use.

Save: allows the user to save new database records or changes to a record; note that this save tool is different from the save tool accessed from the File tab or the disk icon at the top of the screen, which will save the entire database, not just the new or changed records.

Delete: allows the user to delete a database record; note that the SRRTTF PCB Database will have more obvious buttons for deleting records and either option is acceptable to use.

Find: allows the user to search for a record(s) based on criteria.

Replace: allows the user to search for and replace information in a database record.

Under the External Data Tab, the only tool that is mentioned is the Export to Excel, which will export the database records to Excel.

Figure 3. Access tools under the Home tab (top) and External Data tab (bottom) used in SRRTTF PCB Database procedures.
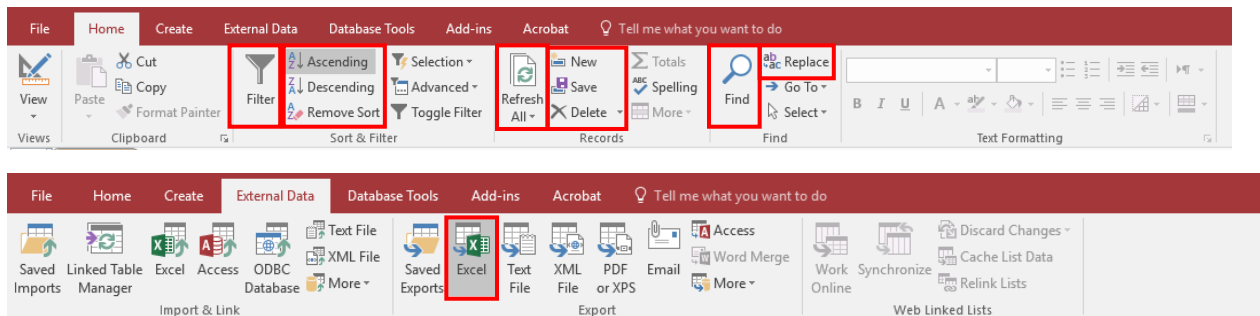
User Interface Main Page

The features accessed by the main page are listed below by the numbers shown in Figure 4.

1. Viewing sampling locations (blue window), samples by location (yellow window), and sample data including editing information for both locations and specific samples.
2. Loading PCB data to the database.
3. Viewing and assigning blanks to samplings including method, rinsate, trip and field blanks.
4. Generating reports or exporting data.
5. Viewing and editing references used by other database features including standard units, parameters, and other codes. Note: Do not make changes to these references. Please contact the database contacts at Spokane County Water Resources for any requested changes.

Figure 4. SRRTTF Database user interface main page features.
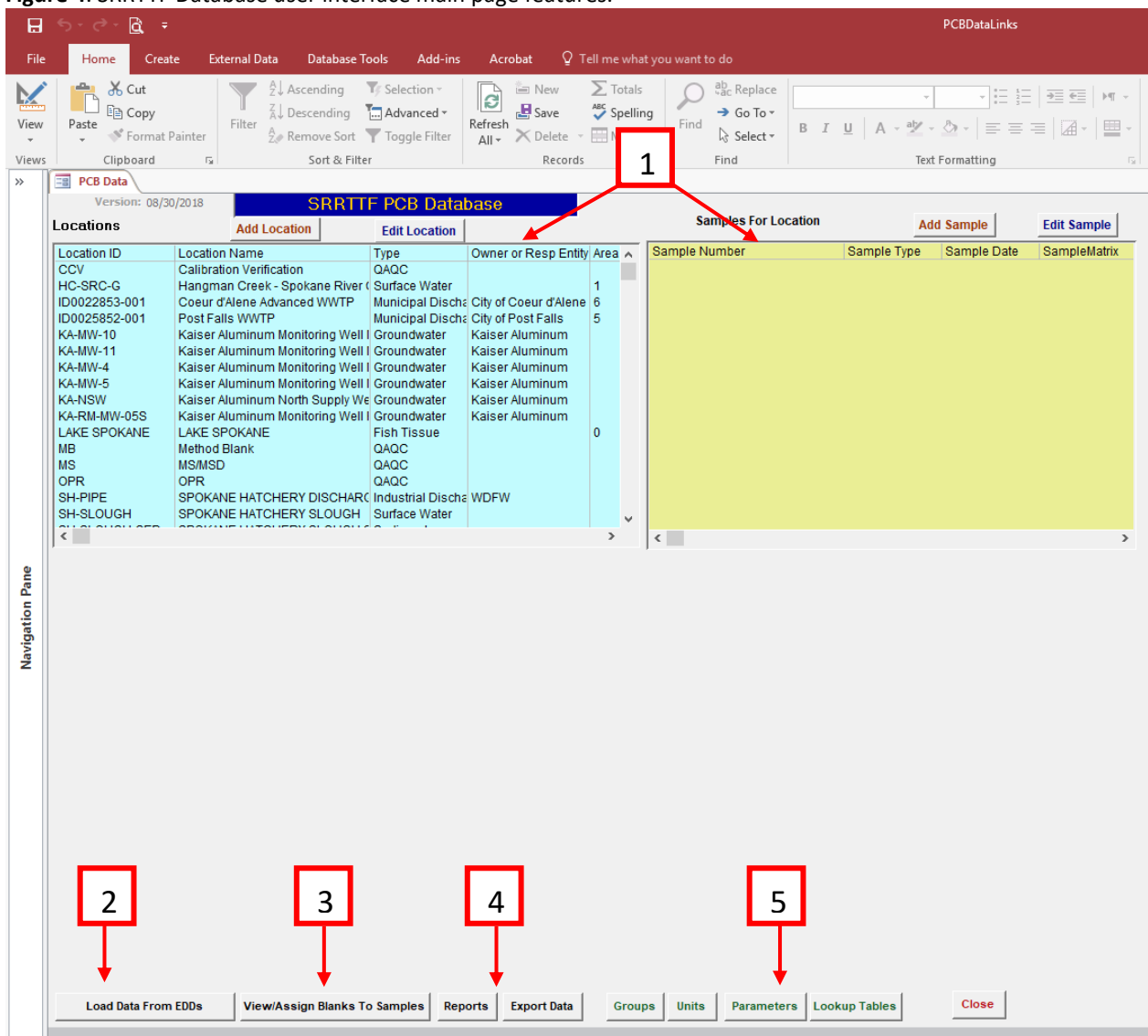
Viewing data from Main Page

The main page only displays data for one sample at a time for quick viewing. Data manipulation for analysis is not possible with this feature. If data for multiple samples is needed, or if analysis is to be conducted on the data, use either the report or export data features.

To view data for a specific sample, select the location at which the sample was taken in the location list (blue window) and then select the specific sample of interest in the samples list (yellow window). The data for that sample will be displayed. Figure 5 shows an example of viewing data for Sample ID HC1-081414-1520 collected from the Hangman Creek location (HC-SRC-G). If a specific parameter result for that sample is of interest, use the Find tool to locate the specific result.

Figure 5. Viewing data from the main page. This an example of viewing data for Sample ID HC1-081414-1520 collected from the Hangman Creek location (HC-SRC-G). The Find tool can be used to find the result for a specific parameter.

Reports/Exporting Data

From the main page, select the "Reports" button at the bottom of the screen (note: Export Data feature is not currently active). This will bring up a menu listing various report types (Figure 6). Most reports will generate Excel spreadsheets and those that do not are Access tables that can be exported to Excel. Please note that depending on the number of data points, potential need for unit conversions, and blank corrections, some reports can take a while to generate but should not be more than 20 minutes in most cases. Please be patient.

Figure 6. Report Menu.
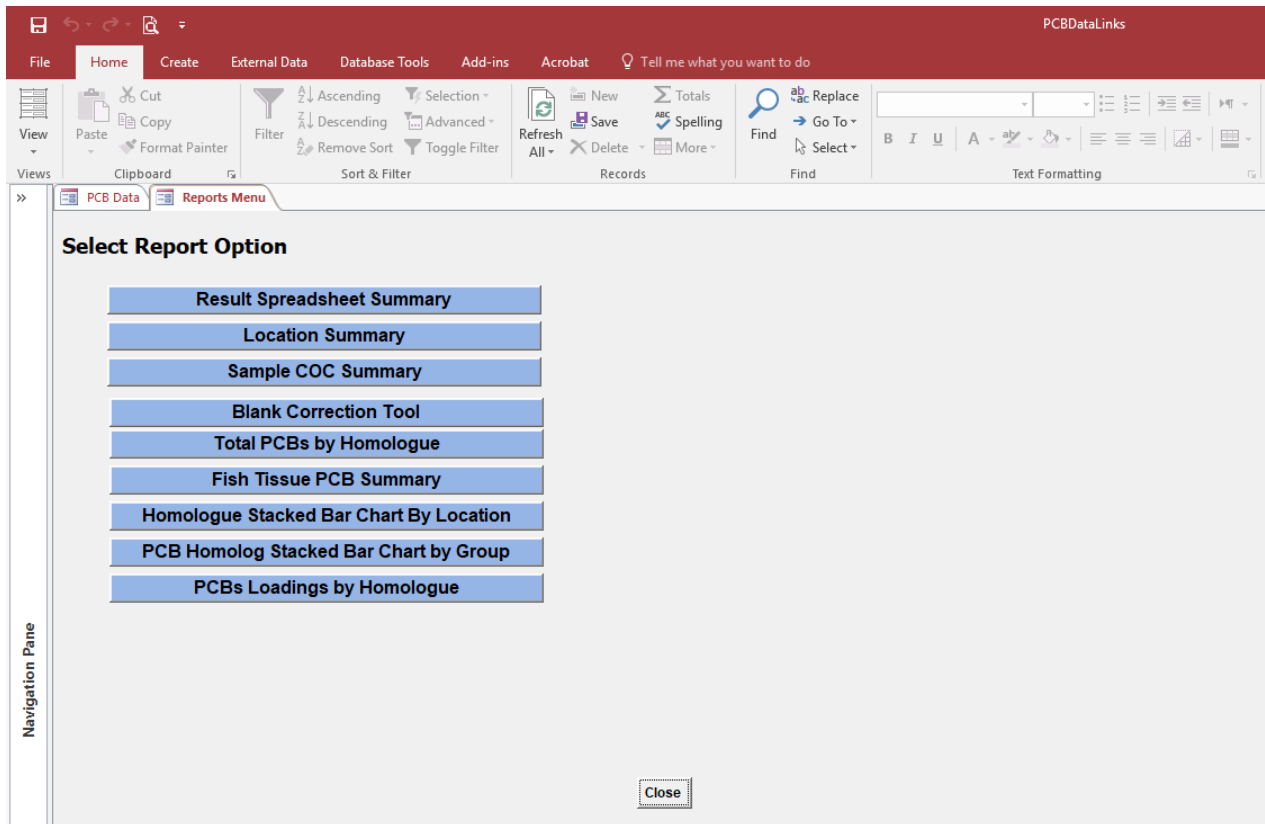
Report Types

The database generates several types of reports that provide varying information. This section describes the different report types to help in selecting a report for use. Table 2 provides a quick summary of the types of reports generated by the database, which are described in further detail in the following subsections.

Table 2. Summary of Report types.

Report Name	File Type	Report Information	Blank Correction Available/Default Method
Result Summary Spreadsheet	Excel File	Uncorrected data by location, sample date, sample ID, and PCB congener and homolog group.	No
Location Summary	Access Table (in database)	Information on each sampling location identified in the database	No
Sample COC Summary	Access Table (in database)	Chain-of-custody (COC) information for selected samples	No
Blank Correction Tool	Excel File	Uncorrected and corrected data by location, sample date, sample ID, and PCB congener and homolog group.	Yes/3x all blanks
Total PCBs by Homolog	Excel File	Total PCBs by homolog group and by location, sample date, sample ID.	Yes/no correction
Fish Tissue PCB Summary	Not Applicable	Report currently not active – No fish tissue data in database	No
Homolog Stacked Bar Chart by Location	Excel File	Proportion of each homolog group in a sample by location and date	No – feature not active though option is displayed
Homolog Stacked Bar Chart by Group	Not Applicable	Report currently not active	No
PCBs Loading by Homolog	Not Applicable	Report currently not active	No

Sample Location and Collection Reports

The following reports do not provide PCB data, but rather other information regarding sample collection:

Location Summary

This report displays information for all sampling locations including the Location ID, name, owner of the property on which the sampling location is accessed, owner address and contact information, and the type of sampling location. Note that clicking on this report option will immediately open a report table within the database in a new tab (Figure 7). This report will list every sampling location included the database and will not provide an option to limit the report to locations of interest. If an Excel file is needed, the report can be exported to Excel by opening the External Data tab then selecting the Export to Excel function and following the database prompts (Figure 7). The location information can be modified as needed once in Excel.

Figure 7. Example Location Summary Report.

Sample COC Summary

This report displays information regarding the Chain-of-custody (COC) for selected samples including Sample ID, sampling date and time, type of sample, the name and affiliation of the sampler, and the date sent to the lab. After clicking on this report option, a new tab "Selection form for Samples in Report," will open the Select Criteria for Report screen to provide options for limiting the report to locations or samples of interest. For more information on how to do this, refer to the Generating a Report section. Once locations or samples of interest have been selected, the database will open a report table in a new tab (Figure 8). If an Excel file is needed, the report can be exported to Excel by opening the External Data tab then selecting the Export to Excel button and following the database prompts.

Figure 8. Example Sample COC Summary Report.

PCB Data Reports

For viewing and analyzing data, the following reports are useful:

Result Spreadsheet Summary

This report displays <u>uncorrected</u> data by location, sample date, sample ID, and PCB congener and homolog. This report provides the lab qualifiers along with the result for each congener. Note that data correction is not available for this report. After clicking on this report option, a new tab "Selection form for Samples in Report," will open the Select Criteria for Report screen to provide options for limiting the report to locations or samples of interest. For more information on how to do this, refer to the Generating a Report section. Once locations or samples of interest have been selected, the database will generate an Excel file.

An example of the report is shown in Figure 9. Note that this report generates results in nanograms per liter (ng/l). If you desire results in picograms per liter (pg/l), this can be easily done in Excel by multiplying the report results by 1000. Further, this report does not provide Total PCBs for the samples. The Total PCBs (uncorrected) can be easily calculated in Excel.

Figure 9. Example Result Spreadsheet Summary Report.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Uncorrected Analytical Data														
2	Location			SR-MP		SR-MP		SR-MP		SR-MP		SR-MP		SR-MP	
3	Sample Date			8/19/2015		8/20/2015		8/21/2015		8/21/2015		8/22/2015		8/22/2015	
4	Sample Number			SR8a-081915-1330		SR8a-082015-0848		DUP 4		SR8a-082115-1305		SR8a-082215-1525		SR8a-Composite	
5	Parameter Name (Units)	Homologue	IUPAC #												
6	2-Chlorobiphenyl (ng/l)	mono	1	0.0016	B	0.00106	B J	0.00177	B	0.00172	B	0.00152	B	0.00129	B J
7	3-Chlorobiphenyl (ng/l)	mono	2	0.00127	B J	0.00075	B J	0.00224	B	0.00173	B	0.00136	B J	0.00102	B J
8	4-Chlorobiphenyl (ng/l)	mono	3	0.00212	B	0.00115	NJ B J	0.00179	B	0.0017	B	0.00153	B	0.00137	NJ J
9	2,2'-Dichlorobiphenyl (ng/l)	di	4	0.0018	B	0.00143	B J	0.00128	B J	0.00137	B J	0.0013	NJ B J	0.00159	J
10	2,3-Dichlorobiphenyl (ng/l)	di	5	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
11	2,3'-Dichlorobiphenyl (ng/l)	di	6	0.00051	J	0.00052	J	0.00044	J	0.0	UJ	0.0	UJ	0.00046	J
12	2,4-Dichlorobiphenyl (ng/l)	di	7	0.0	UJ	0.00025	J	0.00039	J	0.0	UJ	0.0	UJ	0.0	UJ
13	2,4'-Dichlorobiphenyl (ng/l)	di	8	0.00196	B	0.00194	B	0.00175	B	0.00208	NJ B	0.00205	B	0.00173	B
14	2,5-Dichlorobiphenyl (ng/l)	di	9	0.00026	J	0.00025	J	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
15	2,6-Dichlorobiphenyl (ng/l)	di	10	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
16	3,3'-Dichlorobiphenyl (ng/l)	di	11	0.0107	B	0.0115	B	0.0123	B	0.0104	B	0.013	B	0.0139	B
17	3,4-Dichlorobiphenyl (ng/l)	di	12	0.00042	C J	0.0	C UJ	0.0	C UJ	0.0	C UJ	0.0	C UJ	0.00041	C B J
18	3,4'-Dichlorobiphenyl (ng/l)	di	13	0.0	C12	0.0	C12	0.0	C12	0.0	C12	0.0	C12	0.0	C12
19	3,5-Dichlorobiphenyl (ng/l)	di	14	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
20	4,4'-Dichlorobiphenyl (ng/l)	di	15	0.00126	B J	0.00069	B J	0.00084	B J	0.0	UJ	0.00128	B J	0.00096	B J
21	2,2',3-Trichlorobiphenyl (ng/l)	tri	16	0.00118	J	0.00108	J	0.00103	B J	0.001	B J	0.00091	NJ B J	0.00094	NJ B J
22	2,2',4-Trichlorobiphenyl (ng/l)	tri	17	0.0012	NJ B J	0.00121	B J	0.00087	NJ J	0.00093	J	0.00081	NJ J	0.00103	B J
23	2,2',5-Trichlorobiphenyl (ng/l)	tri	18	0.00236	C B	0.0024	C B	0.00194	C B	0.00234	C B	0.00184	C NJ B	0.00181	C NJ B
24	2,2',6-Trichlorobiphenyl (ng/l)	tri	19	0.00065	NJ B J	0.00054	NJ B J	0.00048	NJ J	0.00054	J	0.00038	J	0.00042	NJ J
25	2,3,3'-Trichlorobiphenyl (ng/l)	tri	20	0.00319	C B	0.00284	C B	0.00245	C B	0.00228	C B	0.00279	C B	0.00255	C B
26	2,3,4-Trichlorobiphenyl (ng/l)	tri	21	0.00136	C B J	0.00131	C B J	0.00136	C B J	0.00141	C B J	0.00144	C B J	0.00141	C B J
27	2,3,4'-Trichlorobiphenyl (ng/l)	tri	22	0.00092	B J	0.00094	B J	0.00081	B J	0.00078	NJ B J	0.00083	B J	0.00105	B J
28	2,3,5-Trichlorobiphenyl (ng/l)	tri	23	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
29	2,3,6-Trichlorobiphenyl (ng/l)	tri	24	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
30	2,3',4-Trichlorobiphenyl (ng/l)	tri	25	0.0003	J	0.00023	J	0.0	UJ	0.00019	J	0.00021	J	0.0	UJ
31	2,3',5-Trichlorobiphenyl (ng/l)	tri	26	0.0008	C NJ B J	0.00057	C B J	0.00047	C B J	0.00038	C B J	0.00049	C B J	0.00045	C B J
32	2,3',6-Trichlorobiphenyl (ng/l)	tri	27	0.00021	J	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ	0.0	UJ
33	2,4,4'-Trichlorobiphenyl (ng/l)	tri	28	0.0	C20	0.0	C20	0.0	C20	0.0	C20	0.0	C20	0.0	C20
34	2,4,5-Trichlorobiphenyl (ng/l)	tri	29	0.0	C26	0.0	C26	0.0	C26	0.0	C26	0.0	C26	0.0	C26
35	2,4,6-Trichlorobiphenyl (ng/l)	tri	30	0.0	C18	0.0	C18	0.0	C18	0.0	C18	0.0	C18	0.0	C18
36	2,4',5-Trichlorobiphenyl (ng/l)	tri	31	0.0027	B	0.00228	B	0.00209	B	0.00199	B	0.00196	B	0.00203	B
37	2,4',6-Trichlorobiphenyl (ng/l)	tri	32	0.00065	B J	0.00064	B J	0.00063	B J	0.00069	B J	0.00056	B J	0.0006	B J
38	2,3',4'-Trichlorobiphenyl (ng/l)	tri	33	0.0	C21	0.0	C21	0.0	C21	0.0	C21	0.0	C21	0.0	C21

Data Summary

Blank Correction Tool

This report displays uncorrected and corrected data by location, sample date, sample ID, and PCB congener and homolog group. The user can correct the data using a variety of correction methods. The data can be corrected using the method blank, trip blank, field blank, rinsate blank, or all blanks. The correction factor can be any number, though it is typically 3x, 5x or 10x the selected blank value. The default is 3x all blanks and must be changed if another method is desired.

After clicking on this report option, a new tab "Selection form for Samples in Report," will open the Select Criteria for Report screen to provide options for limiting the report to locations or samples of interest, and to select the blank type and factor for data correction. For more information on how to do this, refer to the Generating a Report section. Once locations or samples of interest have been selected, the database will generate an Excel file.

An example of the report is shown in Figure 10. Note that this report generates results in nanograms per liter (ng/l). If you desire results in picograms per liter (pg/l), this can be easily done in Excel by multiplying the report results by 1000. Further, this report does not provide Total PCBs for the samples, or totals by homolog group. The Total PCBs (uncorrected and corrected) can be easily calculated in Excel. Totals by homolog group can also be easily be done in Excel using a pivot table or other method, or can be generated using Total PCBs By Homolog report. The ability to manipulate this report easily in Excel using both the uncorrected and corrected data makes this report the most versatile. However, due to the data correction calculations, this report can take longer to generate.

Note on Database Correction Methods

THE PCB DATABASE USES CENSORING TO CORRECT DATA. IN THIS METHOD, THE DATABASE CENSORS, OR EXCLUDES, SAMPLE RESULTS BELOW THE BLANK RESULTS MULTIPLIED BY THE CORRECTION FACTOR AND REPORTS SAMPLE RESULTS THAT ARE ABOVE THAT VALUE ON A PER CONGENER BASIS.

FOR EXAMPLE, IF CORRECTING DATA USING 3X THE METHOD BLANK, THE SAMPLE'S CONCENTRATION FOR A CONGENER WOULD BE CORRECTED TO ZERO (THEREBY EXCLUDING THE RESULT) IF ITS LESS THAN 3X THE METHOD BLANK'S CONCENTRATION OF THAT CONGENER; HOWEVER, IF THE SAMPLE'S CONCENTRATION FOR THAT CONGENER IS ABOVE 3X THE METHOD BLANK'S CONCENTRATION, THE SAMPLE'S CONCENTRATION OF THAT CONGENER WOULD SIMPLY BE REPORTED. SEE FIGURE 9 FOR A DETAILED EXAMPLE OF HOW CENSORING WORKS.

IF ANOTHER METHOD FOR CORRECTION IS DESIRED, E.G. SUBTRACTING THE BLANK RESULT FROM THE SAMPLE RESULT, THEN BLANK CORRECTION MUST BE DONE MANUALLY IN EXCEL.

Figure 10. Example Blank Correction Tool Report using 3x method blank. The report data in the red box is magnified below to show an example of data correction by censoring on a per congener basis. The concentration of each congener in the blank (Column H) is multiplied by the selected correction factor (Column K) to get the concentration by which to compare and censor sample data (Column I). If the sample's concentration of that congener (Column G) is less than the calculated concentration in Column I, it is excluded or reported as zero in the corrected totals (Column J); sample concentrations above the calculated concentration in Column I are simply reported in the corrected totals. In this example, the sample's concentrations for PCB-1, -2, -3 and -5 have been censored and PCB-4 has been reported in the corrected totals.

	A	B	C	D	E	F	G	H	I	J	K
1	LocID	SampleNo	SampleDate	PName	homologue	No (IUPAC-BZ)	Sample Total PCBs	Blank Total PCBs	Total To Compare	Corrected Totals	FactorUsed
2	HC-SRC-G	HC1-032416-1355	3/24/2016	2-Chlorobiphenyl (ng/l)	mono	1	0.001	0.00137	0.00411	0	3
3	HC-SRC-G	HC1-032416-1355	3/24/2016	3-Chlorobiphenyl (ng/l)	mono	2	0.000498	0.000532	0.001596	0	3
4	HC-SRC-G	HC1-032416-1355	3/24/2016	4-Chlorobiphenyl (ng/l)	mono	3	0.00128	0.00109	0.00327	0	3
5	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2'-Dichlorobiphenyl (ng/l)	di	4	0.00203	0	0	0.00203	3
6	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3-Dichlorobiphenyl (ng/l)	di	5	0	0	0	0	3
7	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3'-Dichlorobiphenyl (ng/l)	di	6	0.000923	0.000572	0.001716	0	3
8	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4-Dichlorobiphenyl (ng/l)	di	7	0	0.00151	0.00453	0	3
9	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4'-Dichlorobiphenyl (ng/l)	di	8	0.00225	0.00196	0.00588	0	3
10	HC-SRC-G	HC1-032416-1355	3/24/2016	2,5-Dichlorobiphenyl (ng/l)	di	9	0	0	0	0	3
11	HC-SRC-G	HC1-032416-1355	3/24/2016	2,6-Dichlorobiphenyl (ng/l)	di	10	0	0	0	0	3
12	HC-SRC-G	HC1-032416-1355	3/24/2016	3,3'-Dichlorobiphenyl (ng/l)	di	11	0.00646	0.00652	0.019559999	0	3
13	HC-SRC-G	HC1-032416-1355	3/24/2016	3,4-Dichlorobiphenyl (ng/l)	di	12	0	0	0	0	3
14	HC-SRC-G	HC1-032416-1355	3/24/2016	3,4'-Dichlorobiphenyl (ng/l)	di	13	0	0	0	0	3
15	HC-SRC-G	HC1-032416-1355	3/24/2016	3,5-Dichlorobiphenyl (ng/l)	di	14	0	0	0	0	3
16	HC-SRC-G	HC1-032416-1355	3/24/2016	4,4'-Dichlorobiphenyl (ng/l)	di	15	0.00172	0.00107	0.00321	0	3
17	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',3-Trichlorobiphenyl (ng/l)	tri	16	0.00214	0	0	0.00214	3
18	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',4-Trichlorobiphenyl (ng/l)	tri	17	0.00133	0.000607	0.001821	0	3
19	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',5-Trichlorobiphenyl (ng/l)	tri	18	0.00348	0.00152	0.00456	0	3
20	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',6-Trichlorobiphenyl (ng/l)	tri	19	0.000694	0	0	0.000694	3
21	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3,3'-Trichlorobiphenyl (ng/l)	tri	20	0.00358	0.00179	0.00537	0	3
22	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3,4-Trichlorobiphenyl (ng/l)	tri	21	0.00144	0.000847	0.002541	0	3
23	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3,4'-Trichlorobiphenyl (ng/l)	tri	22	0.0016	0.000612	0.001836	0	3
24	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3,5-Trichlorobiphenyl (ng/l)	tri	23	0	0	0	0	3
25	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3,6-Trichlorobiphenyl (ng/l)	tri	24	0	0	0	0	3
26	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3',4-Trichlorobiphenyl (ng/l)	tri	25	0.000299	0	0	0.000299	3
27	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3',5-Trichlorobiphenyl (ng/l)	tri	26	0.000595	0	0	0.000595	3
28	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3',6-Trichlorobiphenyl (ng/l)	tri	27	0	0	0	0	3
29	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4,4'-Trichlorobiphenyl (ng/l)	tri	28	0	0	0	0	3
30	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4,5-Trichlorobiphenyl (ng/l)	tri	29	0	0	0	0	3
31	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4,6-Trichlorobiphenyl (ng/l)	tri	30	0	0	0	0	3
32	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4',5-Trichlorobiphenyl (ng/l)	tri	31	0.00278	0.00126	0.00378	0	3
33	HC-SRC-G	HC1-032416-1355	3/24/2016	2,4',6-Trichlorobiphenyl (ng/l)	tri	32	0.000818	0.000391	0.001173	0	3
34	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3',4'-Trichlorobiphenyl (ng/l)	tri	33	0	0	0	0	3
35	HC-SRC-G	HC1-032416-1355	3/24/2016	2,3',5'-Trichlorobiphenyl (ng/l)	tri	34	0	0	0	0	3
36	HC-SRC-G	HC1-032416-1355	3/24/2016	3,3',4-Trichlorobiphenyl (ng/l)	tri	35	0	0	0	0	3
37	HC-SRC-G	HC1-032416-1355	3/24/2016	3,3',5-Trichlorobiphenyl (ng/l)	tri	36	0	0	0	0	3
38	HC-SRC-G	HC1-032416-1355	3/24/2016	3,4,4'-Trichlorobiphenyl (ng/l)	tri	37	0.000716	0	0	0.000716	3
39	HC-SRC-G	HC1-032416-1355	3/24/2016	3,4,5-Trichlorobiphenyl (ng/l)	tri	38	0	0	0	0	3
40	HC-SRC-G	HC1-032416-1355	3/24/2016	3,4',5-Trichlorobiphenyl (ng/l)	tri	39	0	0	0	0	3
41	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',3,3'-Tetrachlorobiphenyl (ng/l)	tetra	40	0.00137	0	0	0.00137	3
42	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',3,4-Tetrachlorobiphenyl (ng/l)	tetra	41	0	0	0	0	3
43	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',3,4'-Tetrachlorobiphenyl (ng/l)	tetra	42	0.00067	0	0	0.00067	3
44	HC-SRC-G	HC1-032416-1355	3/24/2016	2,2',3,5-Tetrachlorobiphenyl (ng/l)	tetra	43	0	0	0	0	3

qryBlankCorrectionSummaryByCong

No (IUPAC-BZ)	Sample Total PCBs	Blank Total PCBs	Total To Compare	Corrected Totals	FactorUsed
1	0.001	0.00137	0.00411	0	3
2	0.000498	0.000532	0.001596	0	3
3	0.00128	0.00109	0.00327	0	3
4	0.00203	0	0	0.00203	3
5	0	0	0	0	3

Total PCBs by Homolog

This report displays total PCBs by homolog group for specific samples. For each sample, it also includes location, sample date, and sample ID. This report allows for blank correction; however, since this is optional, the default is for no correction. If corrected data is desired, the user can correct the data using a variety of correction methods. The data can be corrected using the method blank, trip blank, field blank, rinsate blank, or all blanks. The correction factor can be any number, though it is typically 3x, 5x or 10x the selected blank value.

After clicking on this report option, a new tab "Selection form for Samples in Report," will open the Select Criteria for Report screen to provide options for limiting the report to locations or samples of interest, and to select the blank type and factor for data correction. For more information on how to do this, refer to the Generating a Report section. Once locations or samples of interest have been selected, the database will generate an Excel file.

An example of the report is shown in Figure 11. Note that this report generates results in nanograms per liter (ng/l). If you desire results in picograms per liter (pg/l), this can be easily done in Excel by multiplying the report results by 1000. Further, this report does not provide Total PCBs for the samples. The Total PCBs (uncorrected or corrected, depending on the report criteria) can be easily calculated in Excel. Further, a stacked bar chart like the one generated in the Homolog Stacked Bar Chart report, can easily be created as well.

Figure 11. Example Total PCBs by Homolog Report using 3x method blank.

	A	B	C	D
1	homologue	SR-PF-G | 08/12/2014 | SR12-081214-1545	SR-PF-G | 08/14/2014 | SR12-081414-1015	SR-PF-G | 08/16/2014 | SR12-081614-0845
2	deca	0	0.000444	0.000657
3	di	0.003706	0	0.004728
4	hepta	0.00371	0.00232	0.0003
5	hexa	0.006854	0.004438	0.000967
6	mono	0	0	0
7	nona	0.000606	0.000344	0.000269
8	octa	0.001633	0	0.000859
9	penta	0.009171	0.001897	0.000536
10	tetra	0.003146	0.000624	0.000694
11	tri	0.001969	0.000303	0.000577
12				
13				
14				

Homolog Stacked Bar Chart by Location

This report graphically displays the proportion of each homolog group in a sample by location and date, and provides the data on which the graph is based in a separate tab. Figure 12 shows an example of the graphical output of this report. Though the Select Criteria for Report screen will show an option for blank correction, blank correction is currently not active for this report. If needed, this type of graph can be re-created in Excel for corrected data generated in a Total PCBs by Homolog report. Note that the proportions in this graph are displayed in nanograms per liter (ng/l). If you desire results in picograms per liter (pg/l), this can be easily done in Excel by multiplying the report results by 1000, refreshing the chart and changing the y-axis label.

Figure 12. Example Result Spreadsheet Summary Report chart.
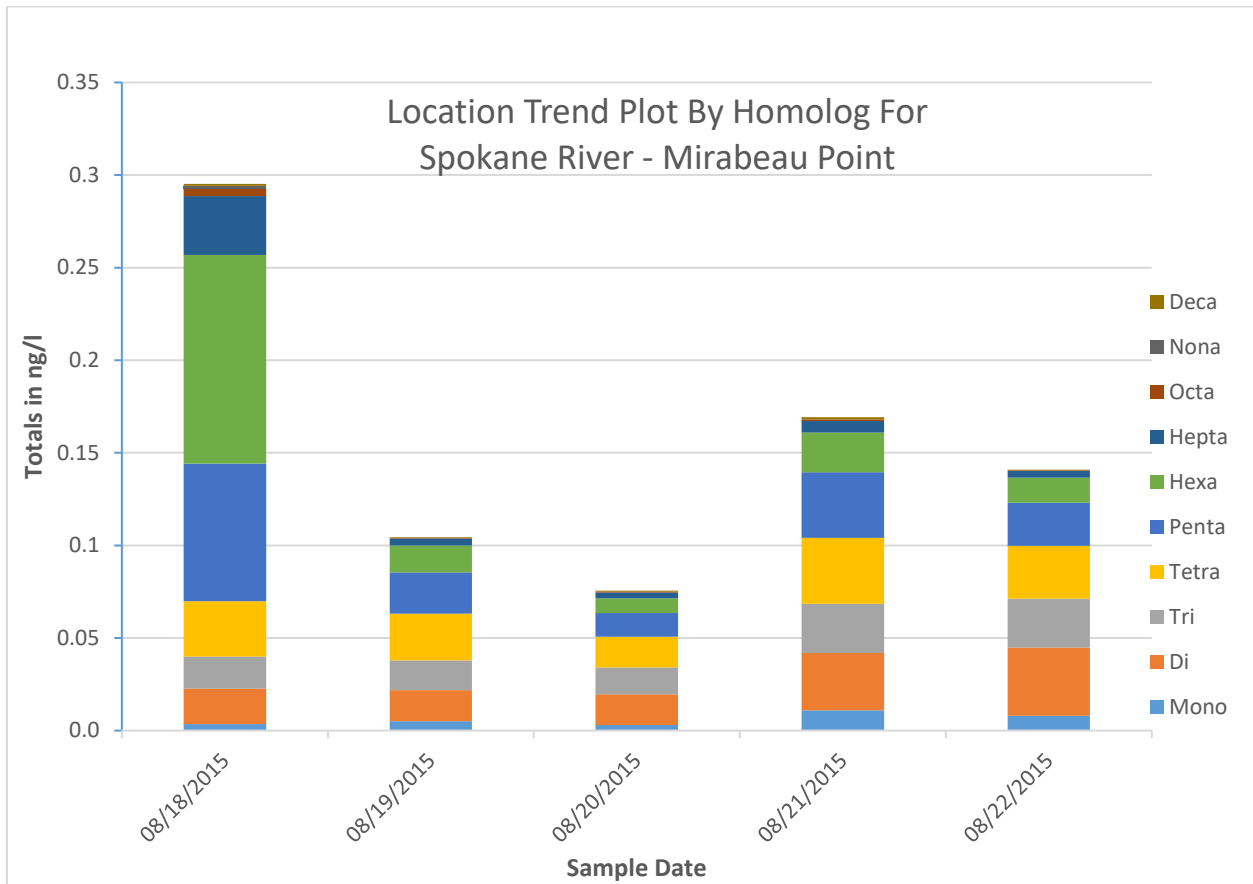
PCB Loadings by Homolog

This report is intended to provide the PCB loading by homolog group from one or more samples. However, this report is currently in development and does not function as intended. This report will display PCB loadings even if the flow (and/or flow units) at the sampling location at the time of sampling was not taken or not provided with the data. For this reason, this report is not currently a reliable means to calculate PCB loadings.

Generating a Report

Once you select on the report you'd like to generate, the Select Criteria for Report screen will open in a new tab (Figure 13). The only exception is for the Location Summary report, in which the report table will immediately appear in a new tab in the database window. For all other reports, the Select Criteria for Report screen will look the same with the only difference being an option for blank correction (this option will not appear for reports that do not provide blank corrected data). In general, the selection criteria for reports is done in the same manner for each report type and is based on the information needed in the report.

Figure 13. Select Criteria for Report Screen. The correction factor and blank correction option shown in red box 3 will not show for reports where blank correction is not an option. Numbers correspond with the general steps described below.

The general steps for generating a report are:

1. **Search for and select the samples for which data is needed**. Use the selection categories to search for the sample(s) for which data is needed. Select the category, provide the appropriate detail(s) in the field, then click on the search button to identify all samples matching the criterion/criteria. All samples matching the criterion/criteria will automatically be highlighted in the matching samples window; if you do not need data for every sample displayed, one or more samples can be selected by holding down the CTRL key and clicking on the sample(s) needed. Depending on your needs, data downloads are easiest by Sample Type or Sample Location

(described in detail later). Use the procedures described to select the appropriate samples for reporting in the matching samples window.

2. **Provide file directory and name for saving the generated report**. Once the appropriate samples are highlighted, in the Export File Name box, tell the database where to save the report. If the default name is not changed, the report will be saved in the same file in which the database was saved (C:\SRRTTF PCB Database\). File naming tips are described later in further detail.

3. **When blank corrected data is needed, and the report has the option to correct the data, provide the desired correction factor and Blank Correction option**. If a correction method is not selected, the default will be used; this may be no correction or 3x all blanks, depending on the report type (see Table 2). Again, note that blank correction is not an option for all reports, so this step is skipped when generating such report types.

4. **Click on the green "Next" button to generate the report**. Most report types will generate an Excel file, but some reports will simply open a new screen in the database (see Table 2).

Selecting Samples for Reporting

The following sections describe the methods for selecting the sample(s) for which data is reported. Please note that not all the Selection Categories features are currently operational, as some are still in development.

Non-functioning Selection Categories are: Location Group, Sample Group, Sampling Event, and River Zone.

Note on Selecting Samples

ALL SAMPLES MEETING THE SELECTION CRITERIA WILL AUTOMATICALLY BE HIGHLIGHTED IN THE MATCHING SAMPLES SCREEN. IF YOU DO NOT NEED DATA FOR EVERY SAMPLE DISPLAYED, ONE OR MORE SAMPLES CAN BE SELECTED BY HOLDING DOWN THE CTRL KEY AND CLICKING ON THE SAMPLE(S) NEEDED. THE DISADVANTAGE TO SELECTING ONE OR MORE SAMPLES IN THIS MANNER IS THAT IT MAY REQUIRE SOME KNOWLEDGE OF THE SRRTTF DATA TO KNOW HOW TO BE SELECTIVE IN CHOOSING SAMPLES.

Sample Number: Generate a report by sample number, or sample ID, to obtain data for one or more specific samples. To get the data for a specific sample, select the "Sample Number" check box, then use the associated field to type in the sample number. Then click the red "Search" button. The sample will automatically be highlighted.

Note there is no drop-down menu; the user must type in the Sample ID.

This requires knowledge of the SRRTTF data; specifically, the information typed must be an accurate start to one or more sample numbers to identify any matching samples. The entry cannot just be any part of the sample number.

For example, some SRRTTF sample numbers are in a Location-Date-Time code format, e.g. SR#-MMDDYY-HHMM. If an accurate location code is provided (e.g. SR3), the database will identify all samples that begin with that location code. If an accurate location and date sequence is provided (e.g. SR3-061616), it will pull up any samples beginning with that sequence. However, if just a date code is provided (e.g. 061616), it is likely that no samples will be identified as matching the search criterion, since no samples would begin with that sequence.

Note that multiple sample numbers cannot be entered at once.

If you need data for more than one sample from the same location, you can try a location code (which is usually the start for most Sample IDs, as previously described) or use the Location ID selection category.

If you use a location code, all samples beginning with that location code will automatically be highlighted. If you do not need data for every sample displayed, see the following [note](#).

If you need data for more than one sample that is not from the same location, you will need to generate separate reports using this selection category. If generating reports for multiple samples, see the following [note](#).

Sample Type: Generating a report by sample type is the best way to get data for similar sample types at once. To download all the data by sample type, select the "Sample Type" check box, then use the associated drop-down menu to select a sample type.

Note that multiple sample types cannot be selected at once. If data is needed for more than one sample type, multiple reports must be generated.

Once your selection has been made, click the red "Search" button. All the samples categorized under your selected sample type will automatically appear highlighted in the matching samples screen. If you do not need data for every sample displayed, see the following [note](#).

Location ID: Generating a report by location is the best way to get the data for specific locations, trip blanks, method blanks, and spiked matrix samples. Select the "Location ID" check box, then use the associated drop-down menu to select the location in which you are interested.

Note that more than one Location cannot be selected at a time, so the steps must be repeated for each location or set of blank data needed. If unfamiliar with the Location IDs, open the Location Summary Report in the database for use as a reference.

One your selection has been made, click the red "Search" button. All the samples from your selected location will automatically appear highlighted in the matching samples screen. If you do not need data for every sample displayed, see the following [note](#).

Sample Date: Generating a report by date is the best way to get all data for all sample types (environmental samples, duplicates, trip/field blanks, and method blanks) for a specific date or date range. Select the "Location ID" check box, then use the associated fields to enter a specific date or date range in MM/DD/YYYY format. If data from a specific date is desired, that date must be entered in both fields for the selection category to work.

Note that the associated method blank may not appear in the list of matching samples if the date or date range is not extended to include the analysis date, since the method blank is associated with the analysis date rather than the sample collection date. The reason for this is that, in some cases, samples collected across multiple days were analyzed in the same batch, resulting in a method blank that is associated with more than one sample collection date. If the analysis date is not known, the method blank data can be found by looking up the associated method blank's Sample ID (if this is unknown as well), and generating a separate report for the method blank by Sample Number selection category.

Combination of Selection Categories: The functioning Selection Categories previously described can be combined to refine searches. However, keep in mind the various challenges in using each Selection Category when combining them.

Report File Naming

As previously described, the database will need to be told where to save a report in the Export File Name box. All reports have a default file name in the format of:

C:\SRRTTF PCB Database\Report Type – MMDDYY HHMM.xlsx, or

C:\SRRTTF PCB Database\Report Type – MMDDYY HHMM.xls.

The date and time code will be the date and time the criteria screen is opened. For example, when generating a Result Spreadsheet Summary on August 31, 2018 at 8:45 AM, the default file name would be: C:\SRRTTF PCB Database\Sample Data Summary - 083118 0845.xlsx

Note the default name includes a file path that will save the report in the same file in which the database was saved (C:\SRRTTF PCB Database\). If you do not want the reports to go into the same folder as the database, this part of the file name could be deleted and a file path appropriate for your filing system could be used instead.

Note on Generating Multiple Reports
IF YOU ARE GENERATING MUTIPLE REPORTS, BE SURE TO CHECK THE EXPORT FILE NAME BEFORE CLICKING ON THE "NEXT" BUTTON. IF YOU FORGOT TO CHANGE THE NAME, THE NAME FOR THE PREVIOUS REPORT WILL STILL BE IN THE EXPORT FILE NAME FIELD AND WILL BE USED. THIS WILL CAUSE THE PREVIOUS REPORT TO BE OVERWRITTEN. THIS HAPPENS MOST OFTEN WHEN THE SELECT CRITERIA REPORT SCREEN HAS NOT BEEN CLOSED BETWEEN SELECTING A NEW REPORT TYPE OR NEW REPORT CRITERIA.

The name of the generated Excel file will be at the end of that directory ("Report Type – MMDDYY HHMM.xlsx" or "Report Type – MMDDYY HHMM.xls"). This part of the file name should be kept or modified to ensure an appropriate file name.

It is recommended that the file name for reports of blank corrected data be modified to include some indication of the blank correction method. For example, the file name for a Result Spreadsheet Summary reporting corrected data at 3x the method blank might be modified to:

C:\SRRTTF PCB Database\Sample Data Summary 3xMB - 083118 0845.xlsx.

Note that the file extension (e.g. .xls or .xlsx) should not be deleted or changed to avoid errors. The database may be unable to generate the report.

Data Preparation

Database users wanting to have data included in the official database must submit the required information to the database contacts at Spokane County Water Resources. When submitting data, it is important to ensure the data is prepared in the required format called an electronic data deliverable (EDD). The database requires sampling information and analytical results be reported in three EDDs: Location Table, COC Table and Analytical Results Table. The EDDs are Excel files that allow for standardization and easy transfer of information into the database. The EDDs can be obtained from the database contacts. Note that any data entry requests may be brought to the SRRTTF Data Management Workgroup for discussion. Refer to the Data Uploading section of this Guide for more information.

When completing the EDDs, there are several steps that go into preparing the data for data entry. First, the sampling location, chain-of-custody information and data must be entered in the appropriate EDD. Each EDD has a tab for information/data entry (labeled "Data for Import") and another (labeled "Field Definitions") with instructions for completing the EDD including formatting and definitions to be used in completing each field (column) of the "Data for Import" tab. For this reason, while each EDD is described in further detail in the following sections, step-by-step instructions on completing them is not provided here.

This Guide will, however, provide additional insights into ensuring the EDDs will be uploaded into the database without errors. It is important that the data is checked and modified as described to avoid uploading errors. If these steps are not followed prior to submitting data, it may increase the time needed for uploading as Spokane County Water Resources staff must complete these data checks before uploading the data.

After preparing the data in each EDD, save each file in a location and with a name that are easily identifiable when later uploading. It is strongly recommended that the file name for each EDD at least contain the type of EDD it is (e.g. Location, COC, and Analytical Results), as this is important in uploading. Further, the Analytical Results EDD must be saved as a comma separated values (.csv) file for uploading. The other files can be saved in their regular format (typically a Microsoft Excel Worksheet, or .xlsx).

Location Table EDD

The Location Table EDD is used for sampling location information for new sampling locations only. If using sampling locations previously saved in the database, this EDD is not needed. However, be sure that the other EDDs utilize the appropriate Location ID assigned to the location in database; otherwise, the EDDs will result in an error during uploading. If unfamiliar with the Location IDs already utilized in the database, open the Location Summary Report for use as a reference.

COC Table EDD

As expected, the Chain-of-Custody (COC) EDD is used for COC information for all samples collected or transported (in case of field/trip blanks) during a sampling event. However, a COC EDD must also contain information for the lab samples (method blanks, spiked matrix, spiked matrix duplicates) for the results of these samples to be uploaded.

When completing this EDD, please pay special attention to the following:

- **Cross-referencing**: Note that several fields in this EDD must correspond with fields in other EDDs or information already in the database. For example, the Location ID (Column A) must match a Location ID for a sampling location already in the database or in a Location Table EDD. Such fields are described in the EDD's instructions tab. If these fields do not match, the EDD will cause errors to result during uploading.
- **Sample IDs**: The Database_Sample_ID field (Column B) and the Client_Sample_ID (Column C) can be the same or different Sample ID numbers. The Database_Sample_ID is what will be used by the database to identify the sample; the Client_Sample_ID was the ID used during sampling (e.g. it is used on the sample label, COC Form, and by the lab for tracking). In most cases, it is fine to use the same Sample ID in both columns. The benefit to this is that the database is not using a different Sample ID than what may be reported elsewhere. However, if this creates a problem in the database, the Database_Sample_ID can be made different from the Client_Sample_ID in the EDD. For example, if the Client_Sample_ID used on the COC is a generic name such as "Sample 1" or "Effluent", then a more descriptive Database_Sample_ID is recommended.
- **Analysis Requested**: The database is programmed with codes for PCB analysis that should be used in the EDD to ensure this information is uploaded. Currently, the database is only set up with the following codes: 1668A, 1668C, 8082 and Other. If you want to enter data resulting from a different analytical methodology, a new code will first have to be created in the database. In this case, make a request with the Database Contact for a new code to be created.
- **COC on Lab Samples**: As mentioned, information for lab samples samples must be included in a COC EDD for the results of these samples to be uploaded. This is due to the EDD uploading sequence, since the COC EDD is used to begin a sample record in the database prior to the data being uploaded. If uploaded COC EDDs do not include the lab samples, an error will result when the Analytical Results EDD is uploaded that includes those data. Depending on when the COC EDD is being prepared, these lab samples can be included on the same or in a separate COC EDD as the collected environmental samples and trip/field blanks. In either case, the COC data entry for the lab samples must:
    - Identify the Location_ID as MB for all method blanks and MS for all spiked matrix and spike matrix duplicates;
    - Use the Lab_Sample_ID (the ID used by the lab to identify these samples) for the Database_Sample_ID and the Client_Sample_ID;
    - Use the Analysis_Date and Analysis_Time for the Sample_Date and Sample_Time;
    - Identify NA as the Sample_Collection_Type for all lab samples
    - Identify BL as the Sample_Type for all lab samples
    - Use the appropriate sample matrix
    - Use the lab's reported sample size and units for Sample_Size and Sample_Units

Analytical Results EDD

The Analytical Results EDD is used for reporting results of PCB analysis. If given to the laboratory as part of their contract, they can usually provide the results in the EDD format. Analytical data not in this format must be re-formatted using the Analytical Results EDD template to ensure uploading.

Note that this EDD requires the most preparation to ensure the data can be uploaded. After receiving the EDD from the laboratory or when reformatting analytical data, the original results must be checked and modified to ensure that:

- The Sample_ID for all lab blank, spiked matrix, and spiked matrix duplicates use the Lab_Sample_ID;
- The Sample_Date for all lab blank, spiked matrix, and spiked matrix duplicates use the Analysis_Date;
- All results include a CAS number;
- Results reported for TOTAL (TEQ ND=0) and TOTAL (TEQ ND=1/2 DL) are given pseudo CAS numbers; and
- Results reported for the 25 congener-specific TEQ ND=0 and congener-specific TEQ ND=1/2 DL are given modified CAS numbers.

The following sections provide more details about how to efficiently check these items.

Sample IDs and Dates for Lab Samples
These instructions address the first two bullets in the list above.

The Sample_ID is used as a unique identifier by the database to track data by sample. However, when labs use "Lab Blank," "Spiked Matrix" and "Spiked Matrix Duplicate" as the Sample_ID for these types of samples in multiple analysis reports, this convention causes a problem for the database as this creates duplicate IDs for lab samples. This is resolved by using the Lab_Sample_ID as the Sample_ID (Figure 14).

Further, the database is set to ensure all samples include a sampling date. A sampling date will not typically be provided for lab samples since they were not collected in the field. A blank or non-date entry such as "NA" will result in an error when uploading. This is avoided by using the Analysis_Date as the Sample_Date for the lab samples (Figure 14).

To modify the Sample_ID and Sample_Date for all lab blanks, filter the data by either Sample_ID (Column A) or Lab_Sample_ID (Column B) so only the results for the lab blanks are shown. Then copy-paste the Lab_Sample_ID for in place of the Sample_ID for each lab blank result so that both columns match. Next, copy-paste the Analysis_Date (Column L) in the Sample_Date (Column H) so that these columns match. It is fine for these columns to match and will not create import errors in the database. Clear the filter and repeat this procedure for the spiked matrix, and spiked matrix duplicates.

Alternatively, if you're not comfortable with filters, you can also sort the results by either Sample_ID (Column A) or Lab_Sample_ID (Column B) so the results for each sample are grouped together. Once you've sorted the data, find the results for the lab blank, spiked matrix and the spiked matrix duplicates, and repeat the copy-paste procedures described above for each sample's results.

Figure 14. An example of an Analytical Results EDD with the Sample_ID (Column A), Lab_Sample_ID (Column B), Sample_Date (Column H), and Analysis_Date (Column L) highlighted to show the EDD before (top) and after (bottom) modifying the data in these columns for the Lab Blank.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Sample_ID	Lab_Sample_ID	Lab_Name	Sample_M	Percent_M	Percen	QC_Code	Sample_Date	Sample_T	Analysis_I	Extraction_Date	Analysis_Date	Analysis_T	Sample_S
995	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
996	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
997	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
998	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
999	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1000	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1001	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1002	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1003	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1004	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1005	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1006	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1007	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1008	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1009	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1010	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1011	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1012	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1013	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
1014	Lab Blank	WG48454-101	SGS Axys A	Water (whole)			MB	N/A		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Sample_ID	Lab_Sample_ID	Lab_Name	Sample_M	Percent_M	Percent_L	QC_Code	Sample_Date	Sample_T	Analysis_I	Extraction_Date	Analysis_Date	Analysis_T	Sample_S
6059	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6060	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6061	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6062	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6063	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6064	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6065	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6066	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6067	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6068	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6069	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6070	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6071	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6072	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6073	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6074	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6075	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6076	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6077	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36
6078	WG48454-101	WG48454-101	SGS Axys /	Water (whole)			MB	9/20/2014		SGS AXYS	8/25/2014	9/20/2014	2:17:15	2.36

Missing CAS Numbers

These instructions address the third and fourth bullets in the list above.

PCB results are usually organized by a CAS number and IUPAC number (1 – 209, commonly used as the congener number). The CAS number is used by the database as a unique Parameter ID to track each result by PCB congener, mixture (e.g. Aroclor), or homolog group. However, in the Analytical EDD, the lab does not always provide a CAS number with every result (Figure 15). If the CAS number is missing, the data simply will not upload to the database due to the missing information; a missing CAS number will not generate an error during uploading. This makes it more important to ensure all results have a CAS number associated with it.

To check that the CAS numbers are provided, filter the data by CAS number (Column Z) to show only the results that have a blank CAS number. Then sort by IUPAC number (Column Y) to group results together, making it easier to copy-paste the CAS numbers. Enter the CAS number associated with the Compound/IUPAC number for each result.

Alternatively, if you're not comfortable with filters, you can simply sort the results by IUPAC number to group similar results together, and then scroll through the data to find the results with blank CAS numbers. This is usually a less efficient way to work and can result in scrolling past blank CAS number fields if going to quickly.

Figure 15. An example of an Analytical Results EDD with the Compound (Column X), IUPAC number (Column Y), CAS number (Column Z) highlighted to show the EDD before (top) and after (bottom) ensuring all results have a CAS number.

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	Analysis_	Sample_S	Size_Units	Initial_Cal	Instrumer	GC_Colun	Test_type	Test_batc	Batch_ID	Cal_Ver_L	Method_E	Compound	IUPAC_PCB_	CAS_	Conc_Fou	Dilution F	UNITS
5235	3:21:22	1.08	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	80.6	1	PCT_REC
5236	4:25:29	0.924	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	57.8	1	PCT_REC
5237	14:12:16	2.72	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_327	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	89.4	1	PCT_REC
5238	2:17:15	2.36	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	80.7	1	PCT_REC
5239	20:56:40			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		93.5	1	NG/ML
5240	7:37:46			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		96.9	1	NG/ML
5241	19:52:29			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		99.8	1	NG/ML
5242	6:34:09			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		98	1	NG/ML
5243	7:47:17			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		95.8	1	NG/ML
5244	18:28:51			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		98.1	1	NG/ML
5245	19:37:31			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		96.5	1	NG/ML
5246	6:19:14			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L		93.5	1	NG/ML
5247	15:16:26	2.63	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_327	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	70.7	1	PCT_REC
5248	22:00:55	2.47	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_326	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	86.2	1	PCT_REC

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	Analysis_	Sample_S	Size_Units	Initial_Cal	Instrumer	GC_Colun	Test_type	Test_batc	Batch_ID	Cal_Ver_L	Method_E	Compound	IUPAC_PCB_	CAS_	Conc_Fou	Dilution F	UNITS
5235	3:21:22	1.08	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	80.6	1	PCT_REC
5236	4:25:29	0.924	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	57.8	1	PCT_REC
5237	14:12:16	2.72	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_324	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	89.4	1	PCT_REC
5238	20:56:40			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	93.5	1	NG/ML
5239	7:37:46			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	96.9	1	NG/ML
5240	19:52:29			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	99.8	1	NG/ML
5241	6:34:09			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	98	1	NG/ML
5242	7:47:17			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	95.8	1	NG/ML
5243	18:28:51			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	98.1	1	NG/ML
5244	19:37:31			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	96.5	1	NG/ML
5245	6:19:14			########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454			13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	93.5	1	NG/ML
5246	15:16:26	2.63	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_327	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	70.7	1	PCT_REC
5247	22:00:55	2.47	L	########	HR GC/MS	SPB OCTYL	initial	analysis	WG48454	PB4C_326	PB4C_324	13C12-2,3,3',5,5'-PeCB	111L	235416-29-2	86.2	1	PCT_REC

Note that the total toxic equivalency (TEQ) results will be included when filtering for blank CAS numbers, or should be identified when scrolling through to identify blank CAS number fields. Depending on the lab these results may be reported in the EDD in Column X as the following:

- Lower Bound PCB TEQ, or TOTAL (TEQ ND=0)
- Mid-Point PCB TEQ, or TOTAL (TEQ ND=1/2 DL)
- Upper Bound PCB TEQ, or TOTAL (TEQ ND=DL)

All this means is that the total TEQ was calculated by substituting either zero, one-half the detection limit and the detection limit (DL) in for congeners that are reported as non-detected (ND).

Please be aware that these results do not have actual CAS numbers; a pseudo CAS number was created for each these results so that this data can be uploaded to the database. These pseudo CAS numbers and all other CAS numbers for PCB compounds can be found in the database's parameters reference described in the Parameters section in this Guide.

For more information on the creation of the pseudo CAS numbers, the Notes about database modifications to CAS Numbers.

Modifying CAS Numbers

These instructions address the final bullet in the list above.

The congener-specific toxic equivalency (TEQ) results are reported in analytical data under the same CAS number as the associated congener (Figure 16). This results in a "duplicate result" error when uploading data. This is avoided by adding a number to the end of the CAS number for congener-specific TEQ ND=0 and TEQ ND=1/2 DL results: -1 and -2 respectively to match the end of the pseudo CAS numbers for the corresponding Total TEQ results.

The congeners impacted by this are as follows (by IUPAC number):

- 77
- 81
- 105
- 114

- 118
- 123
- 126
- 156

- 157
- 167
- 169
- 189

Figure 16. An example of an Analytical Results EDD with the Compound (Column X), IUPAC number (Column Y), CAS number (Column Z) highlighted to show the EDD before (top) and after (bottom) modifying CAS numbers for PCB 77 congener-specific TEQ ND=0 and TEQ ND=1/2 DL results.

Data Uploading

Database users wanting to have data included in the official database must submit the required EDDs to the database contacts at Spokane County Water Resources. When submitting data, it is important to ensure the data is prepared as described in the Data Preparation section of this Guide. Note that any data entry requests may be brought to the SRRTTF Data Management Workgroup for discussion.

Otherwise, database users are welcome to upload data to their personal copy of the database. The following will describe the procedures for uploading data.

First, go to the main page and click on the Load Data from EDDs button at the bottom of the screen (Figure 4). This will open the "Check EDDs" tab (Figure 17). Each of the EDDs must be checked and uploaded in order shown on the menu: Location, COC and Analytical Result EDD. The only exception to this is the Location EDD, which is only needed when uploading data for new sampling locations not yet identified in the database.

Figure 17. The Check EDD screen and menu for loading each EDD.
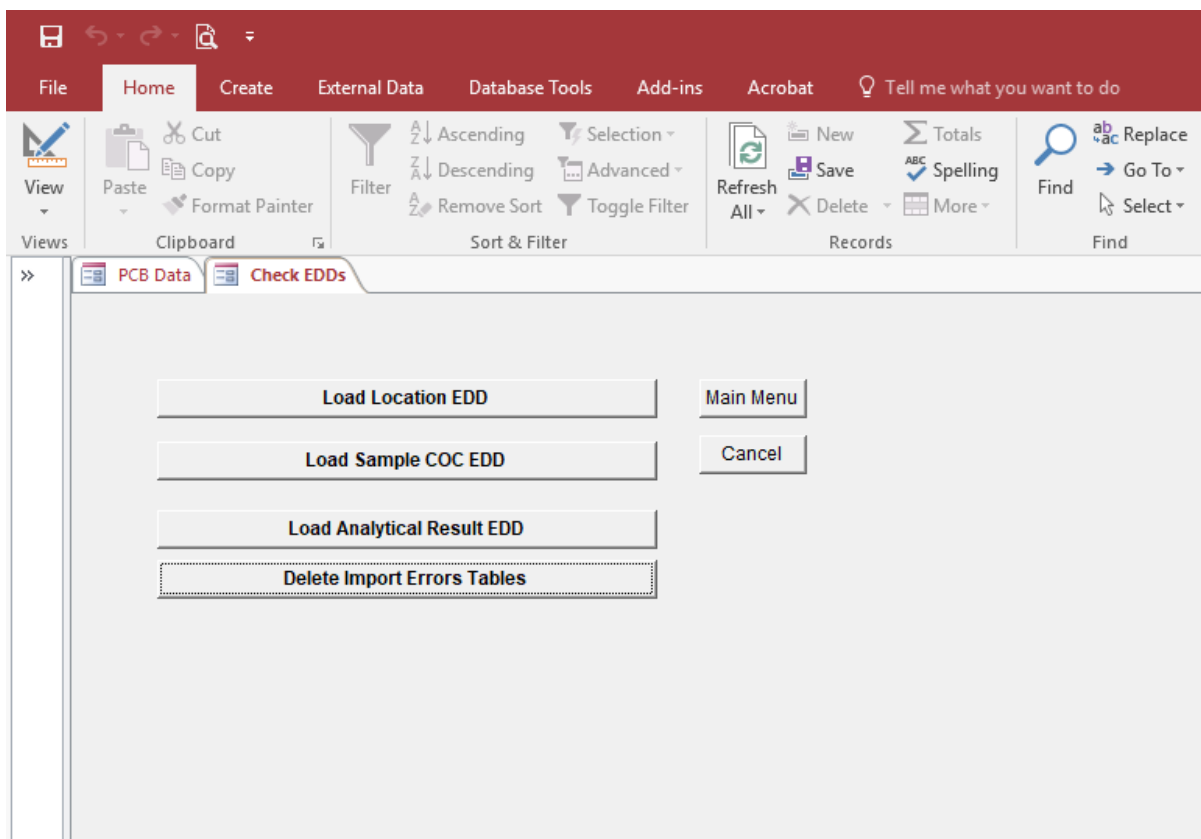
Each EDD goes through the same uploading process, which are as follows:

Select the appropriate Load EDD button from the menu (Figure 17). This will open a new screen to load the EDD (Figure 18).

Figure 17. The Load Location Data EDD screen. Note that the screens for loading the other EDDs will look the same, except that the name on the tab associated with the screen will have a different name.


In
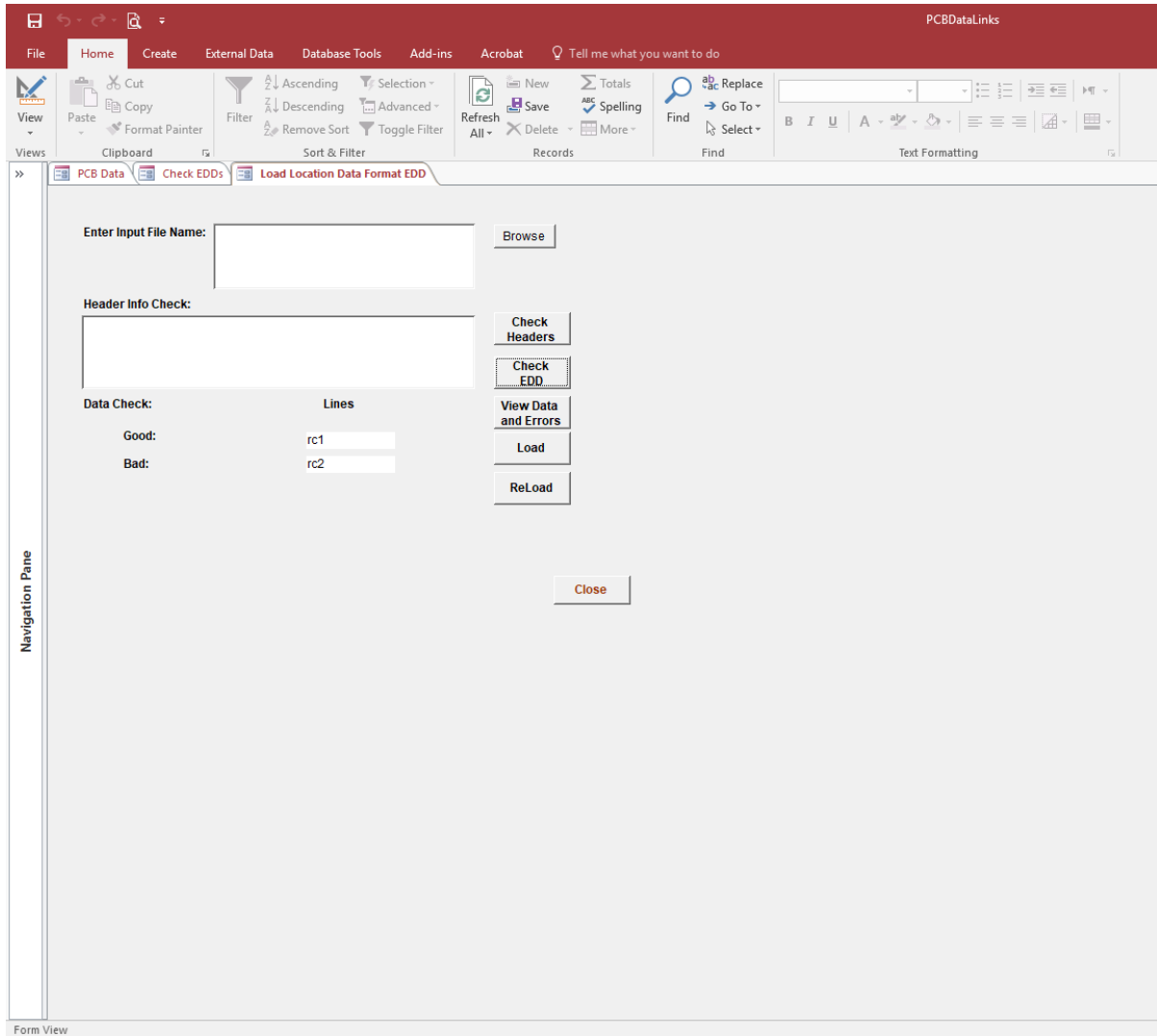
Next, provide a file to upload by clicking on the browse button next to the Enter Input File Name field to locate the file or manually type in the file directory (Figure 19). Note that longer file directories may not be entirely visible within the text box.

Figure 19. A close-up of the Enter Input File field in which the file to be uploaded is identified.
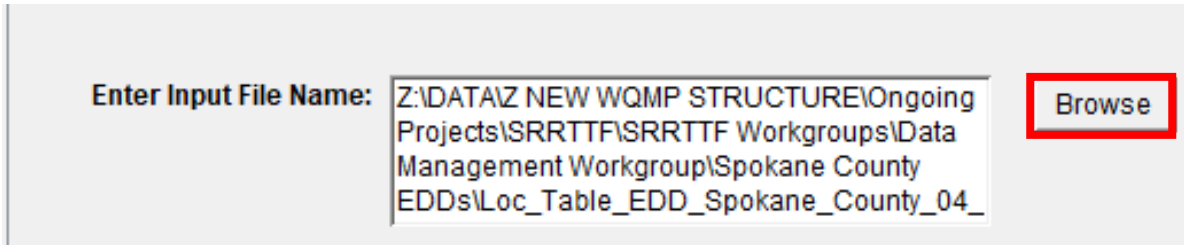
Once the file directory is in the field, click on the "Check Headers" button (Figure 20). This checks that the column headers in the EDD match what is expected for data input. A message box stating "Header Check Complete. Please check the header check box for any errors" should appear when this is done (Figure 20). Click Ok. In the Header Info Check field, the statement "Field names OK," will appear if there are no errors (Figure 20).

Assuming the EDD template was used for data entry and saved as directed, there should be no errors. Otherwise, an error message will appear. In which case, the header error(s) should be fixed in the original file, and the previous steps repeated until no further errors are identified. Information for resolving common header errors is found in the Troubleshooting section of this Guide.

Figure 20. The Load Location Data EDD screen showing the Check Headers button, message box, and where to look for header errors. Note that the screens for loading the other EDDs will look the same, except that the name on the tab associated with the screen will have a different name.
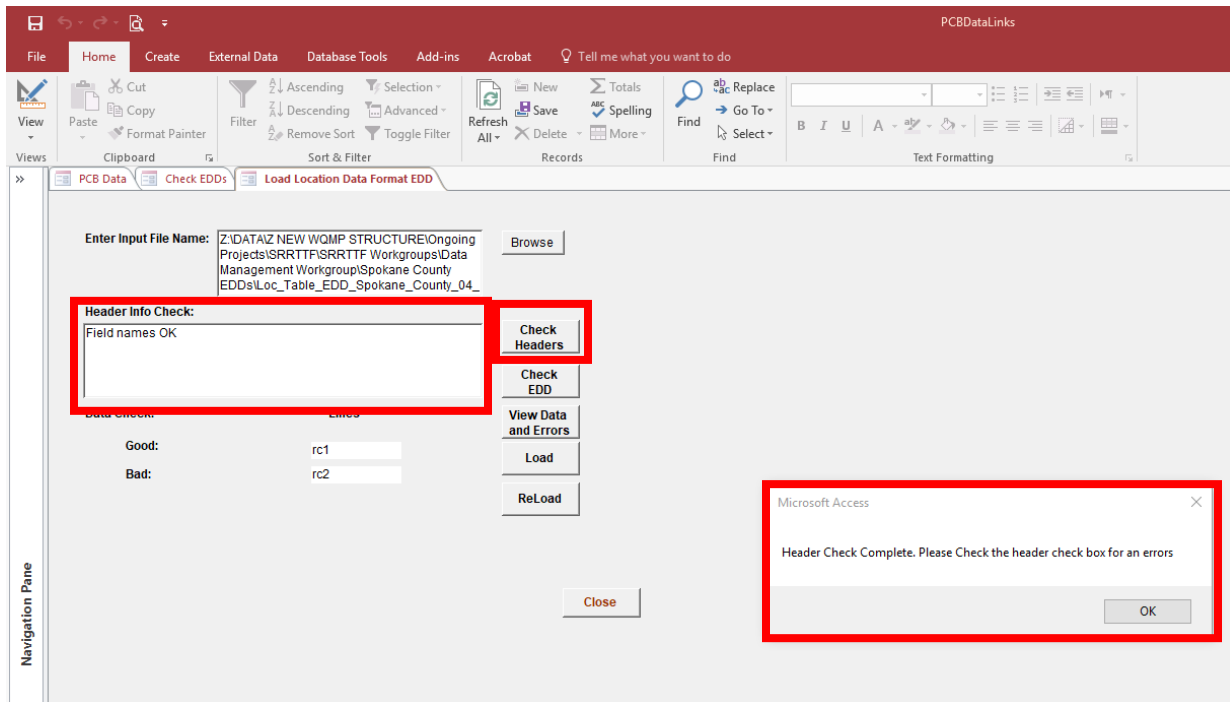
After the Check Headers process is complete, click on the "Check EDD" button (Figure 21). This runs an assessment of the data to check for data errors such as missing information or information not consistent with expected inputs. When this is complete, a message box stating, "Check Complete. Please check the status screen for bad samples or result" should appear. Click OK. The "Status Screen" are the fields under the heading "Data Check." Here the number of good and bad lines of data will appear.

If there are no bad data, click on the "Load" button to upload the data into the database (Figure 21). This will upload the data to the database, completing the process.

If bad data result from the Check EDD process, the errors must be addressed before the data will upload. If the "Load" button is clicked when there is bad data, only the data without errors (good data) will be uploaded to the database. This could potentially lead to "Duplicate" errors when addressing the errors. Erroneous data can either be directly addressed in the database or by correcting the EDD and repeating the previous steps. These methods will be covered in further detail in the following section.

Figure 21. The Load Location Data EDD screen showing the Check EDD button, message box, and where to look for data errors. The Load button is used for loading data that does not result in any errors. The View Data and Errors button allows the user to manually check the data (good and bad) and see error messages for bad data. Note that the screens for loading the other EDDs will look the same, except that the name on the tab associated with the screen will have a different name.
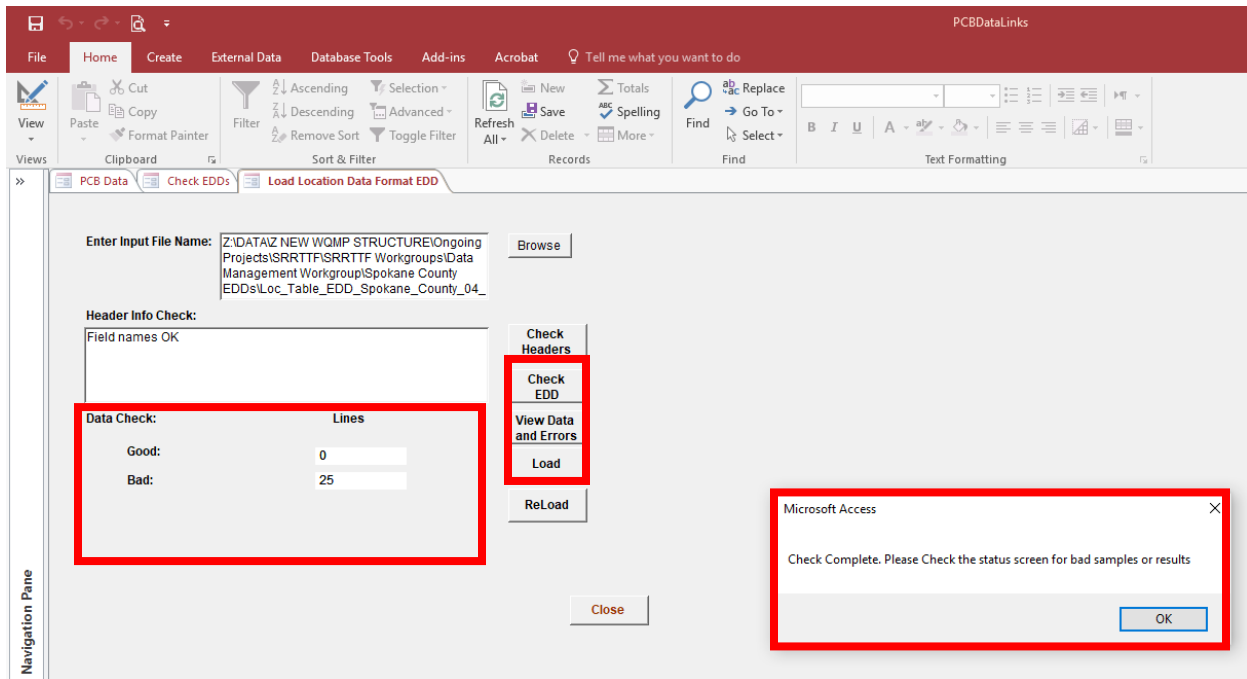
Uploading Steps for Data Errors

If there is bad data, click on the "View Data and Errors" button to open a new screen that displays data and error messages (Figures 21 and 22). This should be done instead of clicking on the "Load" button when there is bad data, but can be done afterwards if the good data was loaded first.

All data (good and bad) will be displayed in the new screen if the good data was not yet uploaded. In this case, not all data displayed will have error messages, which are found in the last column on the screen (Figure 22). To view only the data resulting in errors, use the filter tool on the error message column to

display only the results that do not have a blank in this column. However, if the "Load" button was already selected, only the bad data will be displayed when the "View Data and Errors" button is selected, so filtering is not needed in this case.

Figure 22. The View Data and Errors screen showing the example data and errors. Note that this screen will look the same for the other EDDs, except that the name on the tab associated with the screen will have a different name.
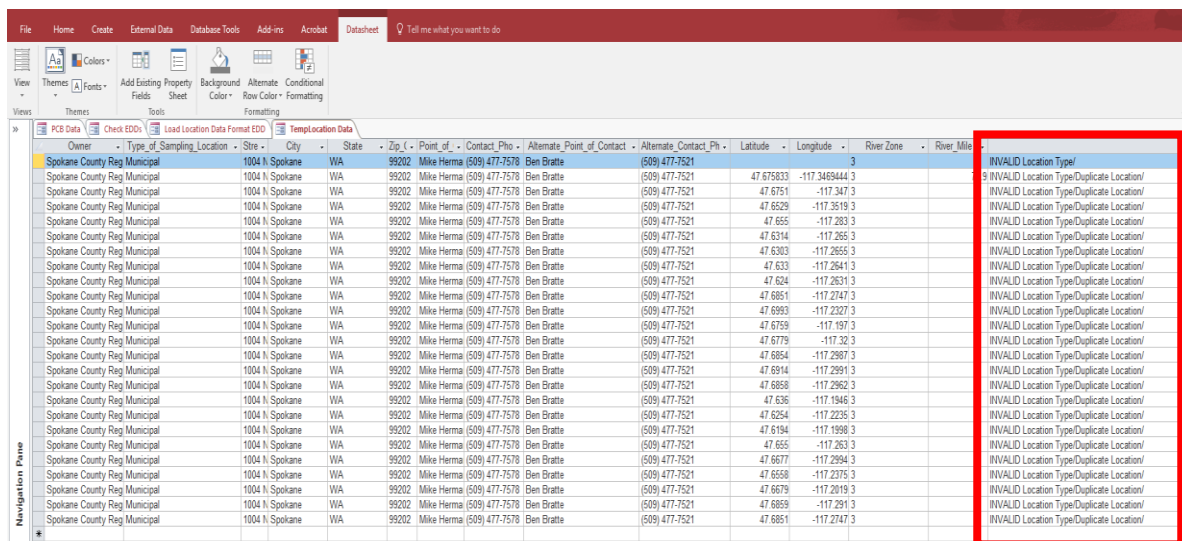
Most data errors can be corrected and saved directly in the database in the "View Data and Errors" screen. The benefit to making changes in the database is that you can quickly tell whether the change resolved the error without having to repeat the previous steps for checking the EDD. In the case where the good data was already loaded, this method of addressing errors will not create "Duplicate" errors. The drawback, however, is that any corrections made in this screen will not be saved to the original file, so it will not provide an accurate record of the data uploaded to the database.

Therefore, it is recommended to make the changes in both the "View Data and Errors" screen and the original file at the same time to avoid the process of reloading the EDD to determine if the errors are resolved while allowing the changes to be saved in the original file.

You may also choose to fix the errors in the original file, and repeat the steps previously described to check the headers and EDD for errors. When fixing the errors in the original file, keep the "View Data and Errors" screen open so you can see which results have errors, what those errors are, and whether previous errors have been resolved if having to check the EDD multiple times. In the case where the good data was already loaded, this method will create "Duplicate" errors since the database will check all data in the EDD, including the good data. During the check EDD process, the database will recognize that the good data is already uploaded in the database and, therefore, will flag this data as a "Duplicate." For more information on duplicate errors, see the Troubleshooting section of this Guide.

This can be avoided by saving a copy of the EDD and deleting the data that was successfully uploaded, so that only the corrected erroneous data is in the file. The drawback to this is that multiple records of the data entered in the database are created for the same set of data.

Be aware that some errors do require that the changes be made to the original file for that information to be saved in the database. Also, note that while working in the "View Data and Errors" screen, similar error types cannot be easily addressed by copy-pasting information into multiple cells at once, as can be done in Excel. The information must be typed or copy-pasted into each cell individually. Unfortunately, this is a function of how Microsoft Access operates and cannot be changed. Therefore, if there are numerous errors of the same type that can be addressed more effectively in Excel, it may be better to make the changes in the original file.

To make changes in the "View Data and Errors" screen, simply provide the new information in the appropriate field to resolve the error. For the example shown in Figures 22 and 23, an error of "INVALID Location Type" resulted because the information provided under Type of Sampling Location column does not match expected input values, and the erroneous information is being replaced with the correct information. When finished making appropriate changes, click on the save button and then the refresh all button in the Tool ribbon. Note, this simply saves your changes; the error messages will not yet disappear, even if your change resolved the error.

Figure 23. The View Data and Errors screen showing how to make changes to resolve identified errors. In this example, an error of "INVALID Location Type" resulted for a lab QA sample categorized as "municipal" in the Type of Sampling Location column. This is being resolved by using the drop-down menu in the field to select an appropriate sample location type, which is QAQC in this case. After making appropriate changes to resolve identified data errors, click on the save button and then the refresh all button in the Tool ribbon. Then, without closing out of the "View Data and Errors" tab, click on the "Load EDD" tab (name will be different for each type of EDD) to return to the Load EDD screen for the next step in resolving data errors. Note that this screen will look the same for the other EDDs, except that the name on the tab associated with the screen will have a different name.
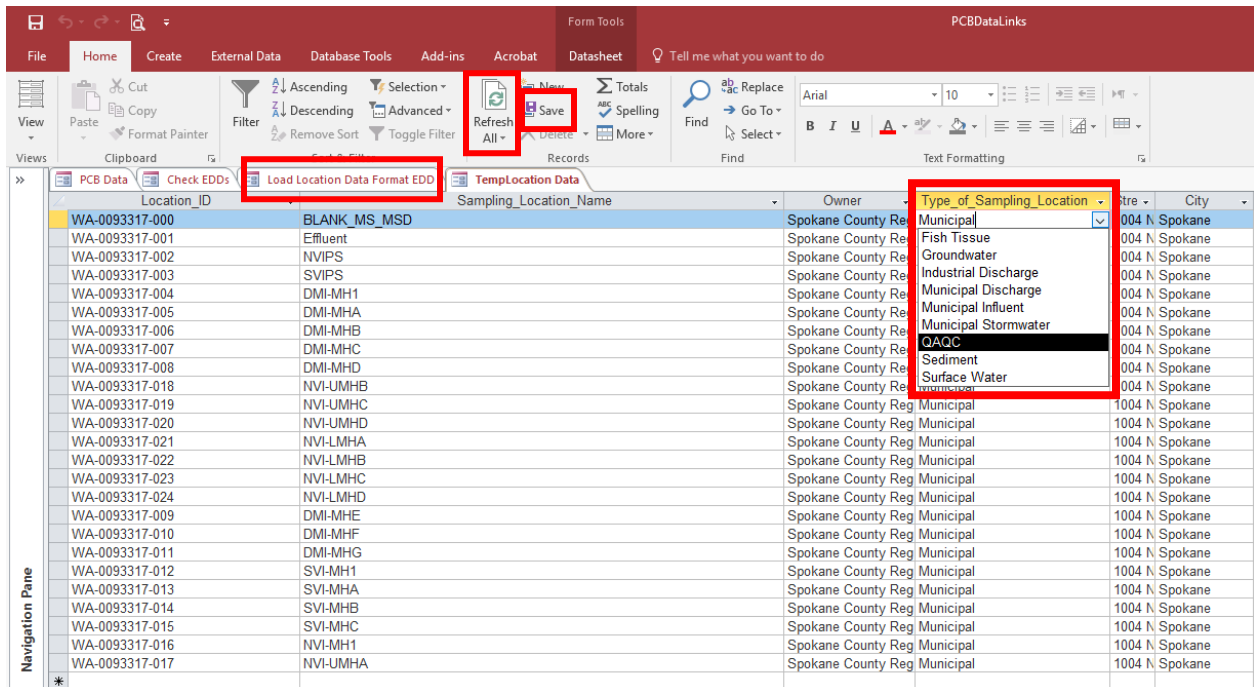
Next, without closing out of the "View Data and Errors" screen, click on the "Load EDD" tab (name will be different for each type of EDD) to return to the Load EDD screen (Figure 23). In the Load EDD screen, click on the "ReLoad" button (Figure 24). A message pop-up stating "Load complete. Please check the

status screen for bad samples or result" will appear. Click Ok. Under Data Check, check the number of good and bad lines of data. Again, only the good data will be uploaded to the database at the end of this process.

Figure 24. The Load Location Data EDD screen showing the ReLoad button, message box, and where to look for unresolved data errors. The ReLoad button is used for loading data after resolving the error(s) in the View Data and Errors screen as previously described. As errors are resolved the number of good data should increase. If the error(s) were not resolved by the changes, the number of bad data will be the same as before. If there are unresolved errors, returning to the View Data and Errors screen via the tab allows the user to continue manually checking the data. Note that the screens for loading the other EDDs will look the same, except that the name on the tab associated with the screen will have a different name.
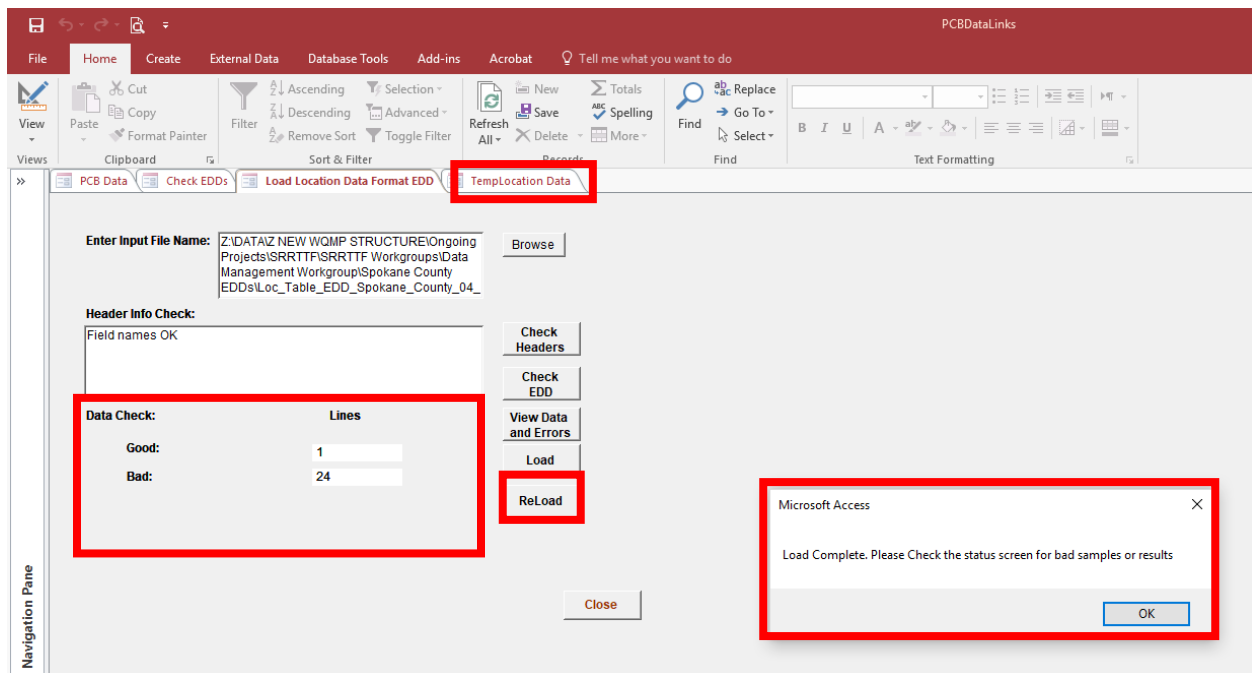
If there is still bad data, return to the "View Data and Errors" screen by selecting on the tab (Figure 24). Resolved errors will have been uploaded and will now show "#Deleted" across the row. Click on the "refresh all" button and the resolved errors will be removed from the list. Repeat this process of moving between the "View Data and Errors" screen and the "Load EDD" screen until all errors are resolved.

Depending on the errors, some amount of troubleshooting may be required to figure out why the data is not acceptable. Information for resolving common data errors is found in the Troubleshooting section of this Guide.

Data Quality Assurance/Quality Control

After uploading data, it is good practice to return to the main page and review some of the sample results to check that the data was uploaded accurately (Figure 25). Viewing data is described in the User Interface Main Page section of this Guide. If errors are noticed in the data, they can be corrected by either 1) deleting the erroneous sample(s) or data and re-uploading the results, 2) correcting the data directly on the main page, or 3) correcting the data in the database using the Edit Sample tool.

As mentioned, re-checking the original file can result in "Duplicate" errors, as the database will recognize that the data has already been uploaded and will flag the data as duplicates rather than overwriting the database record (includes both good and bad data). For this reason, it is strongly recommended to delete any erroneous samples or data from the database before attempting to upload the original file. This will allow good data to be flagged as duplicates and corrected erroneous data to be uploaded. To avoid all the duplicate error flags, the corrected erroneous data can be saved in a separate EDD file for checking and uploading.

The benefit to editing the data on the main page or using the Edit Sample tool is that these directly edit the sample results in the database; however, the change will not be saved in the original file (assuming the original file is also in error, and it was not solely a database error, which can happen). Again, if both the database and original file are opened at the same time, which they should be to check the data, the changes can be made to both without having to re-check and upload the original file.

If reviewing the results from the main page, the sample of concern should be selected to begin making changes to the results in the database. Once the sample is selected, either edit the data directly on the main page or click on the Edit Sample button at the top of the screen (Figure 25). To modify data while on the main page, simply make the changes in the appropriate field. To delete a result for a specific parameter by highlighting the parameter row (an arrow will appear to the left of the Parameter ID) and selecting "Delete" at the bottom of the results window. To start a new record, click on "New" at the bottom of the results window or scroll to the blank row at the end of the listed results (Figure 25).

When adding a result, provide all appropriate information beginning with the CAS number of the parameter. Note that there is a drop-down menu for this field to look-up CAS numbers for parameters already included in the database. Once the CAS number is entered, the parameter name will automatically populate. If the parameter is not included in the database, it will not show in this list. See the Parameters section in this Guide for more details on adding parameters to the database.

After making appropriate edits, click on the Save button.

Figure 25. The main page showing sample results. Sample results should be reviewed here for Quality Assurance/Quality Control (QAQC) after uploading. In the case where sample results are found to be erroneous, while the sample is selected, either edit the data directly in the fields in the results window, or click on the Edit Sample button to open the Add/Edit Sample screen. Note that while results can be changed on the main page, information regarding the sample itself (Sample Number, Sample Type, Sampling Date and Time, Sampling Location, Sample Matrix) can only be changed in the Add/Edit Sample screen.

The Edit Sample button will open the Add/Edit Sample screen. In the Add/Edit Sample screen, you can modify any information regarding the sample itself (Sample Number, Sample Type, Sampling Date and Time, Sampling Location, Sample Matrix). Note that information regarding the sample itself can only be changed directly in the database through the Add/Edit Sample screen.

You can also modify the sample's results by either: 1) select on the Delete button at the bottom of the screen to delete the sample entirely from the database, which will require re-uploading the sample COC and Analytical Results EDDs as described in the Data Uploading section, or 2) click on the Edit Results button to display the sample results in a new tab/screen for direct editing within the database (Figure 26).

Note that the Add/Edit Sample screen has a filter activated; DO NOT deactivate or toggle out of the filter or the sample of interest will no longer be displayed. If the Filter is deactivated, go back to the main page and repeat the previous steps; if you toggle the filter, re-toggle back to the sample.

Figure 26. The Add/Edit Sample screen. Erroneous information regarding the sample itself (Sample Number, Sample Type, Sampling Date and Time, Sampling Location, Sample Matrix) can be edited directly in the database on this screen. Samples with erroneous information or data can be deleted from the database using the Delete button at the bottom of the screen, or the results can be edited in the database. To edit the results, select the Edit Results button.
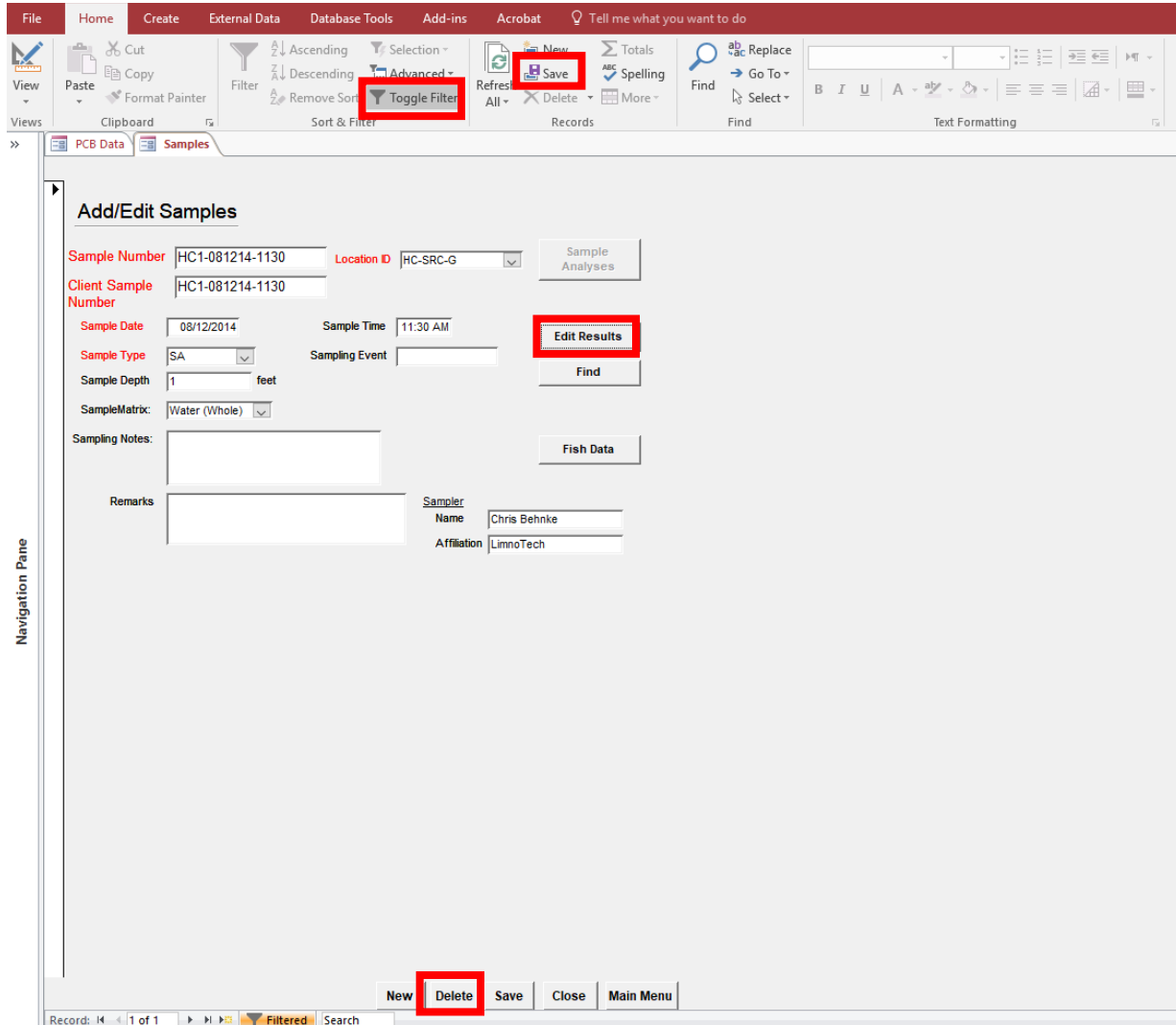
If you open the Add/Edit Results screen, you can modify any of the results shown. Note that the results have a filter activated on this screen; DO NOT deactivate or toggle out of the filter or the results displayed will no longer be for the sample of interest. If the Filter is deactivated, go back to the main page and repeat the previous steps; if you toggle the filter, re-toggle back to the sample (Figure 27).

If a result requires edits to information already in the database, use the Find tool to locate the result that requires edits and make the changes in the appropriate field. If needed, you can also delete the specific result by selecting it and then clicking on the Delete button at the top of the screen. Deleted results can be added in this screen.

Figure 27. The Add/Edit Sample Results screen. Erroneous data can be deleted from or corrected in the database here. Missing data can be added as well. Note that there is a filter activated to show the results for the sample of concern. Do not deactivate or toggle out of the filter. To find a result that requires correcting, use the Find tool at the top of the screen. If needed If needed, specific results can be deleted by selecting the result and then clicking on the Delete button at the top of the screen.

To add a result because it was deleted or missing, go to the end of the listed results and, in the blank row at the end, provide all appropriate information beginning with the CAS number of the parameter for the result being added (Figure 28). Note that there is a drop-down menu for this field to look-up CAS numbers for parameters already included in the database. Once the CAS number is entered, the parameter name will automatically populate. If the parameter is not included in the database, it will not show in this list. See the Parameters section in this Guide for more details on adding parameters to the database.

After making appropriate edits, click on the Save button in the Tool ribbon and close out of the Tabs.

Figure 28. The Add/Edit Sample Results screen. Deleted or missing data can be added by scrolling to the bottom of the screen and entering in the appropriate information for the sample result, beginning with the parameter ID or CAS number. Note that the Parameter ID field contains a drop-down menu for looking up Parameters already included in the database.

Database References

The database has several references that provide expected input values that are used for database functionality including but not limited to checking EDDs and generating reports. For this reason, users are encouraged to utilize these references in data preparation and resolving data entry errors. Each reference is described in detail, including how to utilize these references to reduce or resolve errors. These resources are accessed from the main page, via buttons at the bottom of the screen. All reference buttons are grouped together and have green text (see Item 5, Figure 4).

Database users are encouraged **not** to make changes to the information currently in these references since the database is functionally dependent on them. If you require changes or additions to the official database references, please make a request the [database contacts](#) at Spokane County Water Resources. Note that any changes may be brought to the SRRTTF Data Management Workgroup for discussion.

Parameters

The Parameters reference table includes the Parameter ID/CAS number, parameter name, IUPAC # (where applicable), parameter type, units and detection limits for each parameter included in the database (Figure 29). When preparing the Analytical Results EDD, this reference is useful in looking up the CAS numbers, including the pseudo CAS numbers, for parameters missing this information in the EDD.

To open this reference, from the main page, click on the Parameters button at the bottom of the screen. For efficient searching, use your mouse to place your cursor in any cell under the IUPAC number column to ensure a search by IUPAC number. Then click on the Find button at the top of the screen to open the Find and Replace tool. Under Find What type the IUPAC number of the parameter for which you need the CAS number. Then click on "Find Next," to have the parameter information found. Figure 29 shows a search for PCB 11.

Figure 29. The Parameters Reference Table. Parameter ID/CAS number, parameter name, IUPAC # (where applicable), parameter type, units and detection limits for each parameter included in the database. This reference is useful in looking up CAS numbers (Parameter IDs) for parameters. Parameter information can be found using the Find tool at the top of the page. An example of searching for PCB 11 is shown.

If a parameter is not included in this list, any results for that parameter included in an Analytical Results EDD will not be saved to the database. For example, the parameter Total Suspended Solids (TSS) is not included in this list; therefore, any sample that has been analyzed for TSS will not have those results included in the database. Instead, a "Could not find parameter" error will result during the Check EDD process of an Analytical EDD that includes a result for a parameter that is not included in the database. Database users are welcome to add a parameter(s) to their personal copy of the database.

To add a parameter, scroll to the end of the listed parameters and, in the blank row at the end, provide the all appropriate information beginning with the CAS number of the parameter being added. If the parameter does not have a CAS number, some other unique identifying number must be created to identify the parameter. If this done, this number must be used in the CAS number field in the Analytical Results EDD(s) for all results provided under this parameter. This is similar to the data preparation procedures described for the TEQ results in the Missing CAS Numbers section of this Guide.

After making appropriate edits, click on the Save button and close out of the Tabs.

Look-Up Tables

The Look-up Tables is a directory of all the codes utilized throughout the database (Figure 30). The codes are groups by a code type and the definition/description of each code is provided. Each Code Type can be selected to open a screen with the codes used in that category. These look-up tables are useful in determining expected values or inputs for data entry purposes, including resolving certain data entry errors.

Figure 30. Look-Up Tables screen.
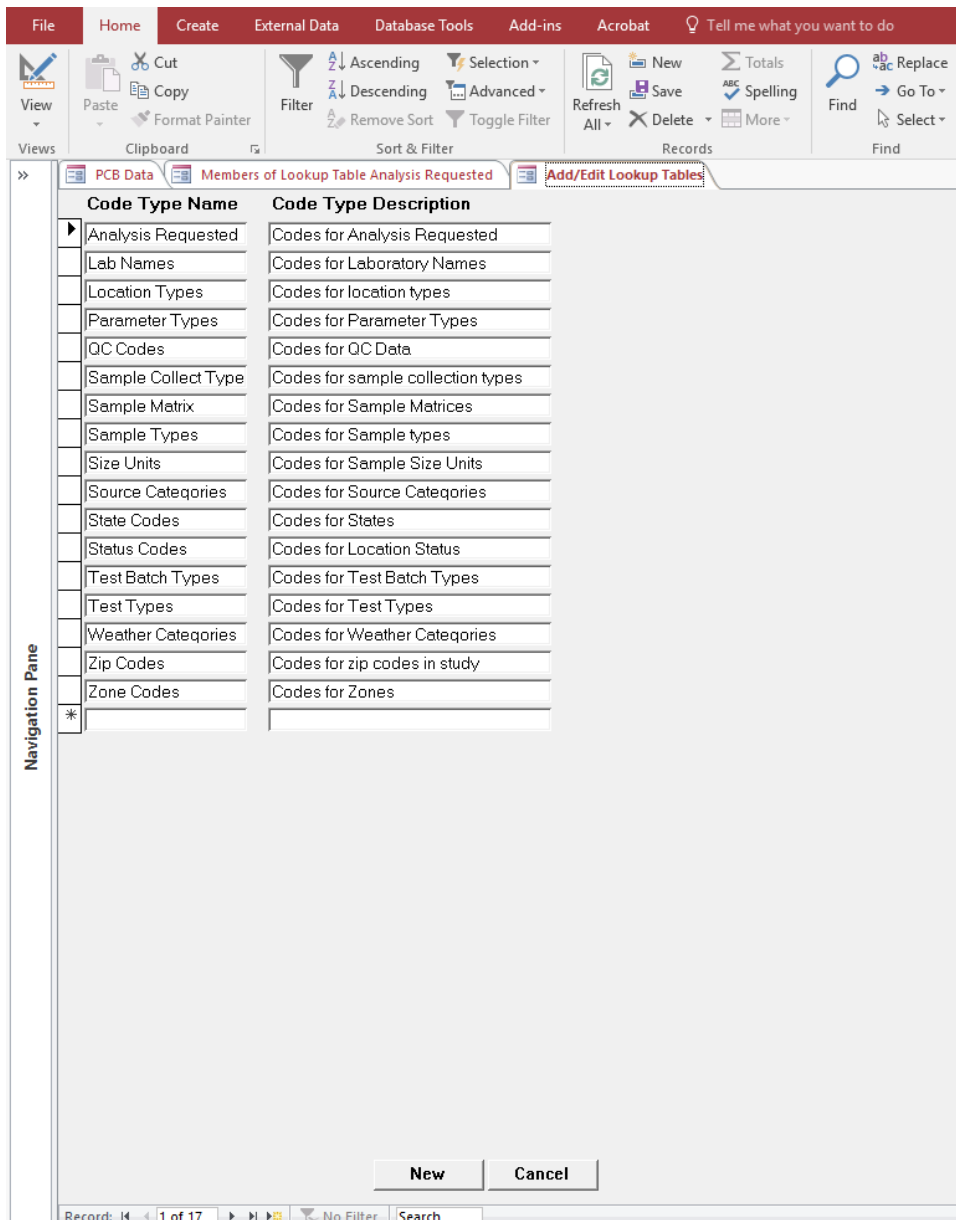
Troubleshooting

The following section provides some troubleshooting instructions to resolve common errors that may occur when utilizing the database.

Macros Not in Navigation Pane

If the macros do not appear in the Navigation Pane, use the drop-down arrow next to the arrow that opens the navigation pane to open the navigation menu. Select to view the macros, and run them as described in the Downloading the Database section of this Guide.

Figure 31. Displaying macros in Navigation Pane.

Uploading Errors

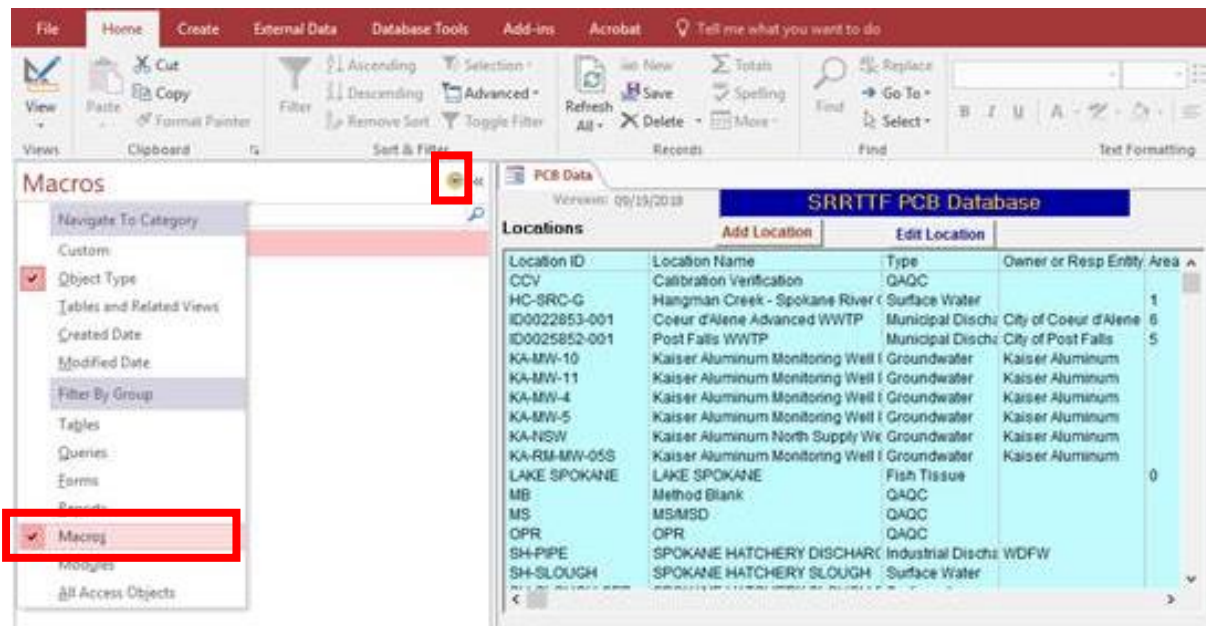Most uploading errors will be avoided when using the EDD templates and following the data preparation guidelines. However, the following are some common uploading errors that may occur.

General Errors

The following are general errors that could result when uploading EDDs.

Cannot locate file

A "Cannot locate file" error will result when the file path to the EDD is either incorrect or, more often, when the file path is too long. To resolve this, first check that the file path provided is accurate. If not, correct the file path (note: if the browse function is used, the path will be accurate). If the path is correct, consider either renaming the file so that the file name is shorter, or move or copy the file into a parent folder, higher in the directory, to shorten the file path. After renaming or relocating the file, re-upload. If the error recurs, the file path is not yet short enough, which means you must either rename or relocate the file again. A quick fix is to create a temporary file on your desktop, or in the database folder created to house the database, where files are temporarily copied until uploaded, so that the original file can remain in your directory as you would like to have it filed.

Cannot import this file

A "Cannot import this file" error will result when the EDD file is not saved in the appropriate file format. Analytical Results EDDs must be saved as a .csv (comma delimited) file.

Check Header Errors

The following are common errors that result during the Check Header process when uploading EDDs.

Missing Columns

If the Check Headers process results in a Missing Columns error, this must be resolved in the original file. Open the EDD resulting in the error and scroll to the final column of data. If there are no blank columns next to the final column of data, unhide unused columns beyond the final column data.

To unhide unused columns, left click on the final column heading until the column is highlighted and then right click to pull up a menu of tools (Figure 32). Select Unhide at the bottom of the menu, which will then display further columns to the right.

Figure 32. An example of fixing a missing columns error in an EDD. Scroll to the final column of data in the EDD; here it is Column Q. Since no columns are shown after the final column of data, the unused columns are hidden. To unhide unused columns, left click on the final column heading until the column is highlighted. Then right click to pull up a menu of tools and select Unhide at the bottom of the menu.
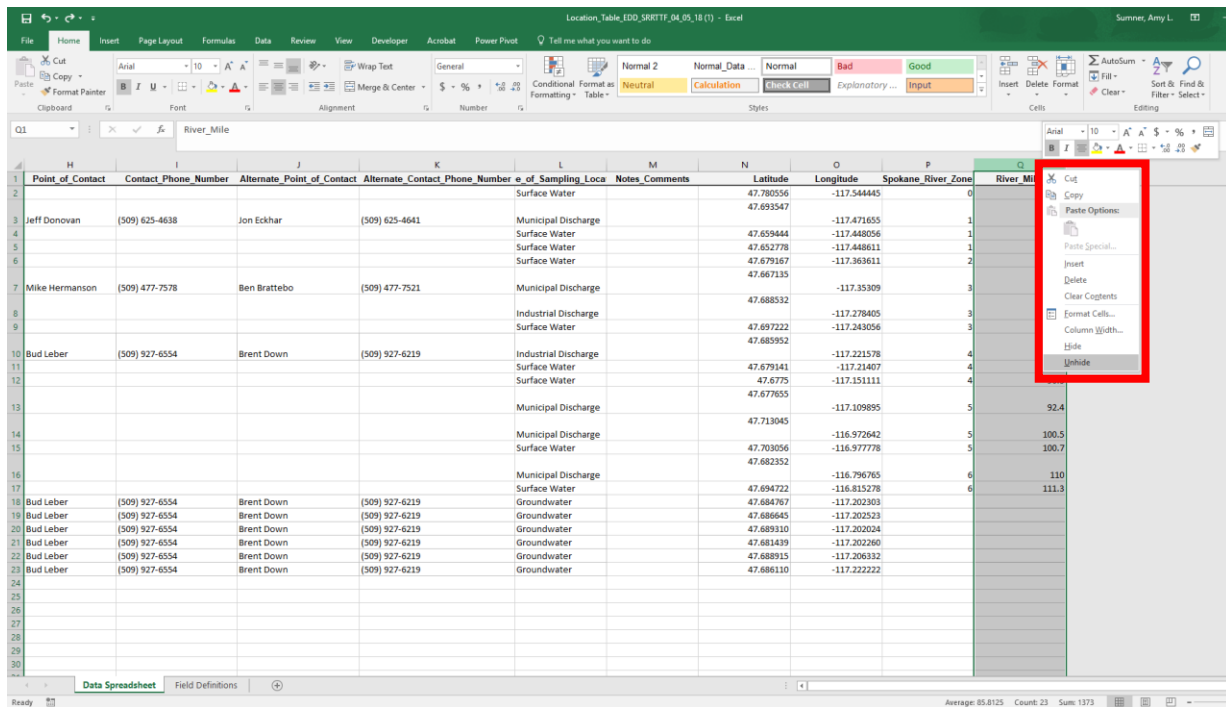
After unhiding the unused columns, or where the unused columns were not hidden, select the first cell in the first unused column (Figure 33).

Figure 33. A continuing example of fixing a missing columns error in an EDD. Select the first (top) cell in the first unused column. Then highlight all unused cells by holding down the SHIFT and CTRL keys and then, in sequence (not at the same time), press the Down Arrow key and then the Right Arrow Key (while still holding the SHIFT and CRTL keys down).
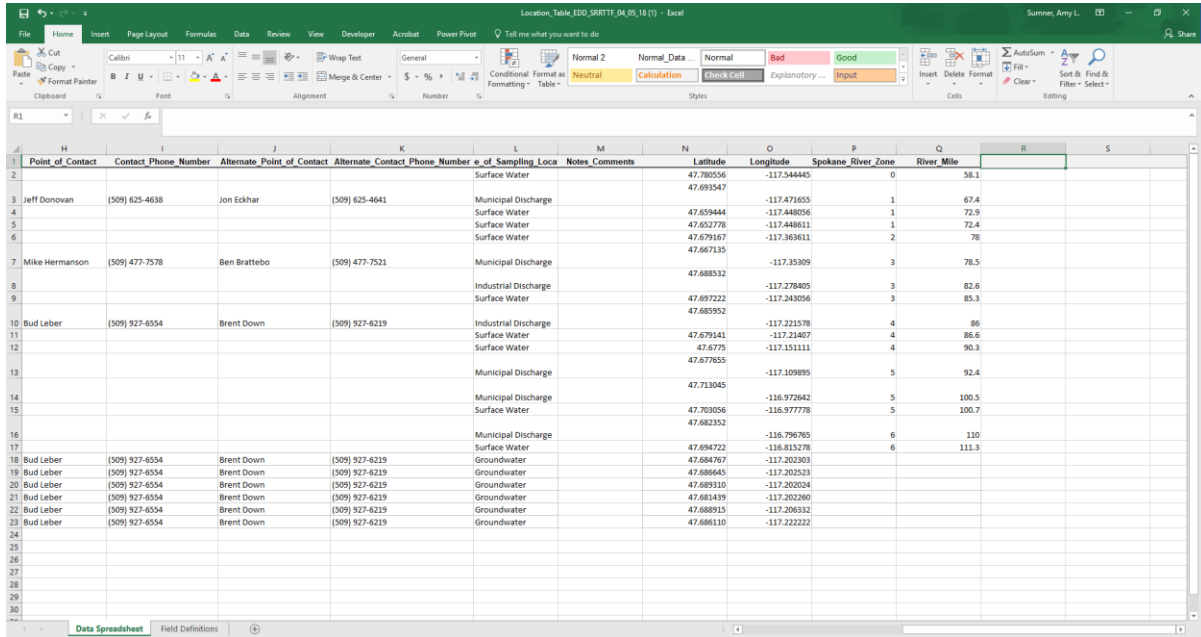

Next, highlight all unused cells by holding down the SHIFT and CTRL keys and then, in sequence (not at the same time), press the Down Arrow key and then the Right Arrow Key (while still holding the SHIFT and CRTL keys down). Once all the unused cells are highlighted, click on the delete button to display the delete menu. Select Delete Sheet Columns (Figure 34). Note that while this action will not appear to have deleted the unused columns, as you will still see these columns, this will reset the last column in the worksheet to ensure the database can accurately account for all the columns of data. This will, therefore, should resolve most Missing Columns errors. Save the file and reupload to the database.

Figure 34. A continuing example of fixing a missing columns error in an EDD. Once all the unused cells are highlighted, click on the delete button to display the delete menu. Select Delete Sheet Columns. Note that while this action will not appear to have deleted the unused columns, as you will still see these columns, this will reset the last column in the worksheet to ensure the database can accurately account for all the columns of data.
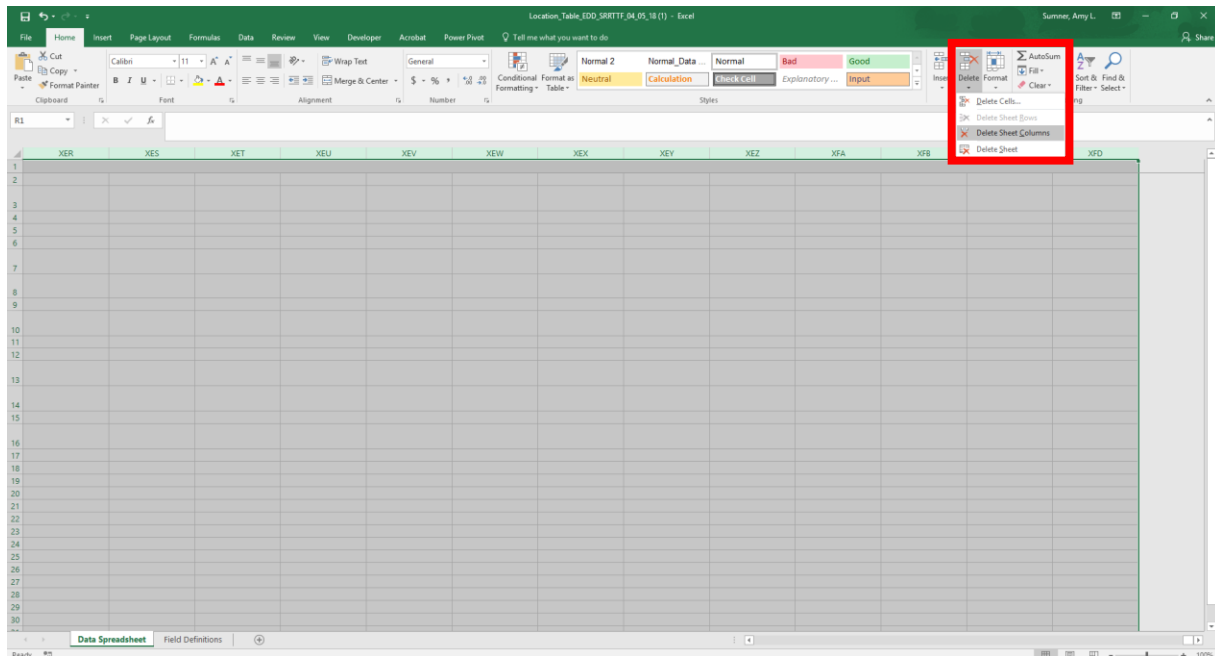
Header is not valid

If the Check Headers process results in a "Header [Header Name] is not valid" error, this means that the column header identified in the error message is not using the expected column heading. This error should only occur when not using the current EDD templates, or if the column heading was changed in the EDD template file. This error must be resolved in the original file for the file to be uploaded. Open the EDD resulting in the error and scroll to the column identified as having the error. Correct the column heading using the EDD template as a check to ensure the correct heading is used. Save the file and reupload to the database.

If the error is not resolved after changing the headers, or if the headers appear correct, the error may be because the EDD file is not saved in the appropriate file format. Analytical Results EDDs must be saved as a .csv (comma delimited) file. Save the file in the appropriate format and reupload to the database. This should resolve the error.

Check EDD Errors

The following are common data errors that result during the Check EDD process when uploading EDDs.

No Such Location

A "No Such Location for Location_ID [NAME]" error will only occur during the Check EDD process for a COC EDD for one of two reasons: 1) the EDD includes a location that is not yet included in the database or 2) the location is in the database, but the Location_ID provided in the EDD does not match the Location_ID in the database. This error should be resolved in both the original file and in the database using the "View Data and Errors" screen as described in the Data Uploading section of this Guide.

The resolution for this error depends on the reason it occurred. In the case where the EDD includes a location that is not yet included in the database, a Location EDD including the location's information must be uploaded first. In the case where the Location_ID provided in the EDD does not match the Location_ID in the database, the Location Summary report can be used for looking up the correct Location_ID to use when updating the EDD and the information in the "View Data and Errors" screen.

Invalid

If the Check EDD process includes an "INVALID [Field Name]" error, it describes a data point that does not have an expected value or input in the field identified in the error message; this includes a blank response in a field that is required to have a value. This error will occur if the EDD instructions and the data preparation guidelines are not followed, as these will describe the values or inputs the database will check for in each field of the EDDs.

This error should be resolved in both the original file and in the database using the "View Data and Errors" screen as described in the Data Uploading section of this Guide. To resolve this error, utilize the EDD template instructions to determine why the value in the identified field is not a valid entry. The Look-up Tables resource may also be helpful in resolving these error types. Note that if making the changes in the "View Data and Errors" screen, certain fields will have drop-down menus that will provide valid inputs.

As an example, in a COC EDD, an INVALID Sample Collection Type could result because the EDD has "Grab Sample" typed in its entirety rather than using the code for grab sample, "G," which is the expected value for this sample type. The error can be resolved by using "G" as the entry in this field.

Duplicate

If the Check EDD process includes a Duplicate error, it is indicating that the identified location, sample, or result is already included in the database. The database is set up to find duplicates based on Location_ID, Sample_ID, and Parameter_ID.

The Location_ID will result in a duplicate only when checking a Location EDD that includes a Location_ID that is already included in the database; remember that the Location EDD is needed only for new locations not currently in the database. The Sample_ID will result in a duplicate only when checking a COC EDD where the Database_Sample_ID is already used for another sample in the database. The Parameter_ID will result in a duplicate only when checking an Analytical Result EDD where the same sample has two results under the same CAS number (which is used as the Parameter_ID in the database), creating two results for the same parameter.

To resolve this error type, compare the information for the location, sample, or result of concern to determine if, indeed, the information resulting in the error is duplicative with information already in the database. If so, the duplicate information can be deleted. If not, the error is resulting because the Location_ID, Sample_ID, and Parameter_ID is already in use and needs to be changed so that it is unique. Please be aware of the following situations when dealing with Duplicate errors:

Note that a duplicate error can result for the any of congener-specific TEQ results if the data preparation guidance on modifying CAS numbers was not followed, or if some of these results were missed in the preparation of the EDD. In this case, the resolution is a little more involved than just changing the Parameter ID. Since the TEQ results are reported under the same CAS number as the congener results,

the database will consider these as three different results for the congener(s) affected, and the concentration being saved for the congener in the database may not be accurate. For the example shown in Figure 35, without the CAS numbers being modified in the EDD, the database just as likely to record 1.54E-04 pg/L as the concentration for the congener PCB-77 as the correct value of 0.574 pg/L. Whichever values are not saved will be flagged as duplicates. Note it does not matter that the compound name is different for these results, since the database checks for duplicates based on the Parameter_ID which is set in the database to the CAS number. Therefore, if the CAS numbers match, the results will be flagged as a duplicate.

Therefore, the congener results must be checked and corrected for the affected congener(s) in addition to adding the TEQ results. These changes can be made in the Add/Edit Results screen as described in the Data Quality Assurance/Quality Control section of this Guide.

Figure 35. An example of an Analytical Results EDD with the congener and congener-specific TEQ results for PCB-77 reported under the same CAS number, which would result in a duplicate error and may result in the incorrect concentration value being saved for the congener.

E Compound	IUPAC_PCB_.	CAS_.	Conc_Fou	Dilution F	UNITS
3,3',4,4'-TeCB	77	32598-13-3	0.574	1	PG/L
3,3',4,4'-TeCB (TEQ ND=0)	77	32598-13-3	1.54E-04	1	pg/L
3,3',4,4'-TeCB (TEQ ND=1/2 DL)	77	32598-13-3	1.54E-04	1	pg/L

Note that a duplicate error can result for total decachloro biphenyl/PCB 209. Total decachloro biphenyl has the same CAS number as PCB 209, but it is not included as a parameter in the database. Therefore, the database reads both results as being for PCB 209, triggering the duplicate error. However, given that PCB 209 is the only decachloro biphenyl, the results under both parameters are typically the same in analytical data, so unlike the TEQ results, it does not matter which concentration is saved by the database for PCB-209. Therefore, while this can be confirmed when checking data errors, these duplicates can simply be deleted.

Could Not Find Parameter

A "Could not find parameter" error will result during the Check EDD process of an Analytical EDD that includes a result for a parameter that is not included in the database. This can only be resolved by adding the parameter to the database and then reloading the Analytical EDD. Database users are welcome to modify the database's parameters list in their personal copies of the database. See the Parameters section of this Guide for details on how to add parameters. However, if the parameter is something that you would like included in the official database, a request must be sent to the database contacts.

Sample does not exist

A "Sample does not exist" error will only occur during the Check EDD process for an Analytical Results EDD for one of two reasons: 1) the EDD includes a sample that is not yet included in the database (has not been uploaded by means of a COC EDD) or 2) the sample is in the database, but the Sample_ID provided in the Analytical Results EDD does not match the Sample_ID in the database. This error should be resolved in both the original file and in the database using the "View Data and Errors" screen as described in the Data Uploading section of this Guide.

The resolution for this error depends on the reason it occurred. In the case where the EDD includes a sample that is not yet included in the database, a COC EDD including the sample's information must be uploaded first. In the case where the Sample_ID provided in the EDD does not match the Sample_ID in the database, the Sample COC Summary report can be used for looking up the correct Sample_ID to use when updating the EDD and the information in the "View Data and Errors" screen.

Compile error

If the error message "Compile error: Can't find project or library" appears when trying to use a report in the database, this is likely due to the database user having a different version of Microsoft Excel on their computer than that for which the database is set up.

When the Compile error message appears, click OK and then choose to Debug. In the Debug window, click on the square icon on the tool bar (Figure 36). Then go to Tools and choose References. In the References screen, uncheck "MISSING: Microsoft Excel 16.0 Object Library" (Figure 37), and then scroll down and check the reference called "Microsoft Excel 15.0 Object Library" (Figure 38) or whatever reference option will work for your computer. Click OK.
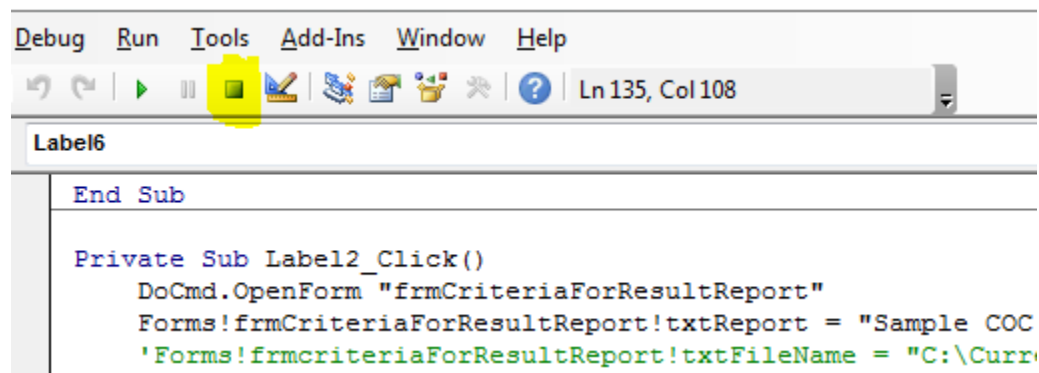
Figure 36. Debug window for a compile error.

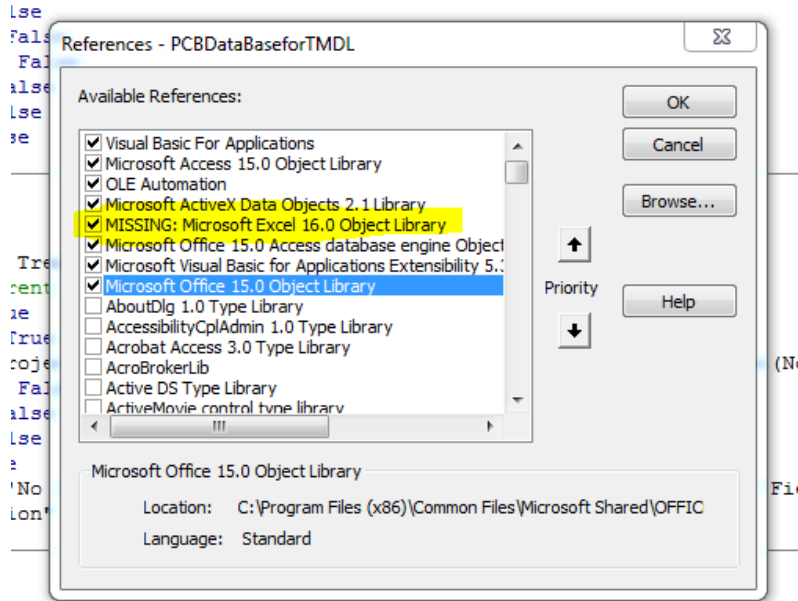**Figure 37**. Reference screen in debugging process for compile error.
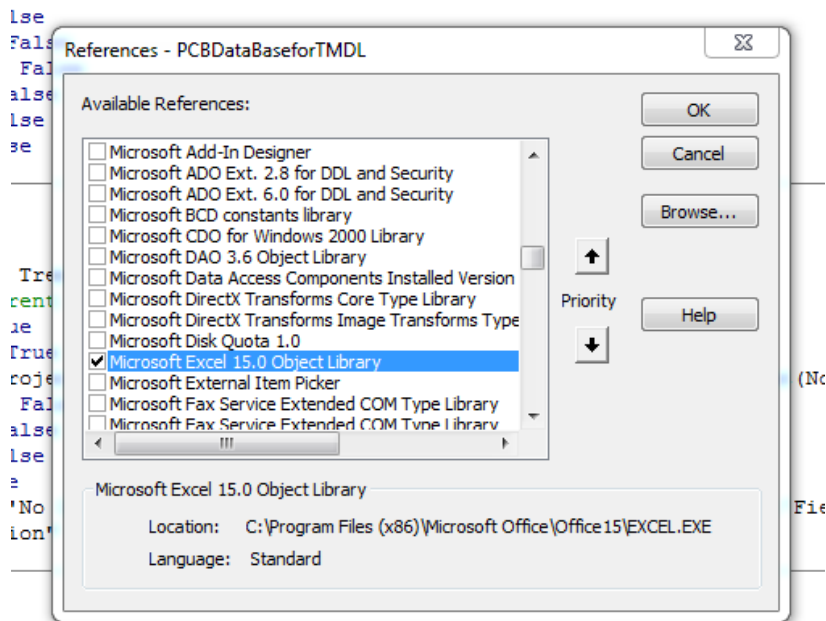

Figure 38. Reference screen in debugging process for compile error.

Important last step: Make sure to save the database changes by clicking the save icon on the main tool bar.

Notes about database modifications to CAS Numbers

The CAS number is used as a unique Parameter ID to track data by parameter. However, this created problems in the database for reporting:

- total decachloro biphenyl
- TOTAL (TEQ ND=0) and TOTAL (TEQ ND=1/2 DL)
- Congener-specific TEQ ND=0 and congener-specific TEQ ND=1/2 DL results

The specific problems and solution for each of these cases were as follows:

Total decachloro biphenyl was not included in the parameters being tracked by the database; however, it has the same CAS number as 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (congener 209), which is included. This resulted in a "duplicate result" error when uploading data that had results reported under both parameters. Only one result would be uploaded, not allowing a duplicate result to be saved under the same CAS number. Since congener 209 is the only decachloro biphenyl, the results under both parameters were ultimately the same in analytical data. Therefore, the problem was resolved by saving the results only under the congener, not the homolog group, in the database. NOTE: reports will show both, as that is how the template was developed, but the internal data (e.g. on the main page) will show the result only under congener 209.

TOTAL (TEQ ND=0) and TOTAL (TEQ ND=1/2 DL) do not have CAS numbers and were not included in the parameters being tracked by the database. This resulted in not saving this data to the database. This was resolved by adding TOTAL (TEQ ND=0) and TOTAL (TEQ ND=1/2 DL) to the database parameters list under pseudo CAS numbers: 00000-00-1 and 00000-00-2 respectively.

Congener-specific TEQ ND=0 and TEQ ND=1/2 DL were not included in the parameters being tracked by the database; however, results were reported for these in analytical data under the same CAS number as the associated congener. This resulted in a "duplicate result" error when uploading data. Unlike the decachloro biphenyl problem, the database was reading three different results for the congeners affected, and the concentration being saved for the congener in the database was not always the accurate result. This was resolved by adding a number to the end of the CAS number for congener-specific TEQ ND=0 and TEQ ND=1/2 DL results: -1 and -2 respectively to match the end of the made-up CAS numbers for TOTAL (TEQ ND=0) and TOTAL (TEQ ND=1/2 DL). For example: the CAS number for 2,3,3',4,4'-PeCB (congener 105) is 32598-14-4; therefore, the CAS number for 2,3,3',4,4'-PeCB (TEQ ND=0) became 32598-14-4-1 and 2,3,3',4,4'-PeCB (TEQ ND=1/2 DL) became 32598-14-4-2.