Instructions on how to use the WVDEP/DNR Scientific Collection Permit Database for Stream Benthic Macroinvertebrates and Fish Version 4.1.1

Contents Overview

NOTE: It is recommended to purchase a manual (*e.g.*, Access for Dummies) in order to learn of and take full advantage of the shortcuts and functionality of MS Access databases.

Disclaimer: The WVDEP/DNR Scientific Collection Permit Database is housed in an older Access format (2000 format .mdb) so that users of older versions of Office can utilize the database. However, the database has only been tested in Office 2010, 2007, and 2003; issues in older versions of Office will not be supported (*e.g.*, Office 2000, Office XP). In addition, this database is not supported in any open-source version of Office (*e.g.*, OpenOffice).

Updates to Version 4.1.1

- Fixed a bug (found by user) that would not display the WVSCI score information after pressing button.

Updates to Version 4.1

- The database calculates WVSCI in two ways:
  1) After the entry of a benthic taxa list, the user can switch to the WVSCI screen and see the metrics and scores calculated. This data is not stored permanently in the database as it is generated solely from queries pulling the data from that one sample only. This is referred to as an "On-the-fly" calculation. On-the-fly calculation of the WVSCI within the form has not been changed.
  2) During the export of data (All or by Project) from the database to excel spreadsheets, a macro erases all old WVSCI collapsed taxa lists, metrics, and scores and replaces them with new, updated versions that are stored in tables. Some users were experiencing extreme delays in the export of data (All and by Project) due to a large volume of benthic data in the database. The older versions (4.03 and before) of the database calculated the WVSCI for all samples in the database thru one set of queries that collapsed the taxa to family, calculated the WVSCI metrics and scores, and then stored the data in a set of tables for export. The new version (4.1) collapses the taxa list to family and saves the collapsed taxa data into a table (BENTHIC_FAMILY_WVSCI) first, and then, in turn, uses this table as a basis for the WVSCI calculation queries that will populate the WVSCI metrics and scores in a table for export.
- The narrative score for a WVSCI of 60.6 to 68 has now been changed to read as "Impaired-Gray Zone" to reflect the updated impairment thresholds utilized since the 2012 Integrated Report/303d list.

Updates to Version 4.03

- On close, the database will compact and repair. If multiple users are accessing a network copy of the database, then the compact and repair will occur when the last user exits the database. This should help keep databases containing larger datasets running as smoothly and quickly as possible.
- **Latitude and Longitude Degrees Minutes Seconds** (DMS) are now required for every station.
- A "No Fish" option has been added to the FISH_TAXA_CODE list for those streams where Fish are absent/not detected during a sampling event and has been color highlighted red when populated.
- Color coded highlights have been added to the **WVSCI** and **RBP Scores** & **Narrative Categories** based on Impairment or Threshold status respectively.
- Color coded highlights have been added for when a Taxa **Count** or Parameter **Value** has been left blank in the Benthic, Fish, and WQ tables.
- Color coded highlights have been added to help identify which Benthic Taxa records will and will not be included in the IBI calculation based on the **Sample Methodology** (*i.e.*, 200-Count Subsample) and **Exclude IBI?** designations.

- The calculation time for the WVSCI in the data entry forms should be shorter in databases with large datasets.
- The WVSCI Narrative Category for the Gray Zone no longer refers to any implied impairment status (*i.e.*, Gray Zone-Unimpaired).
- The ANCODE_LOOKUP, BENTHIC_TAXA_CODE, COUNTY_LOOKUP, FISH_TAXA_CODE, and WATER_QUALITY_PARAMETER_LOOKUP tables have been updated with recent additions by the WVDEP Watershed Branch.
- The data export process has an additional export Excel file for Organizations to help facilitate submission of data for WVDEP DMR Permit requirements.

I. Copy the Database and accompanying files

Copy the database to either:

A local desktop hard drive location

For example C:\DEP DNR SCP DB

Or:

A Network Server

For example Q:\DEP DNR SCP DB

A network server is ideal as many users can access it from any connected desktop (or laptop if wireless is available) and network servers are more likely to have a regular backup schedule.

II. Choose a Database Version Upgrade Strategy

There are two strategies for upgrading to the latest version of the WVDEP/DNR Scientific Collection Permit Database for Stream Benthic Macroinvertebrates and Fish.

Start fresh each year

To use a new version or copy of the database for each DNR Collection permit year (*i.e.*, one copy of the database holds all data from the 2011 DNR Collection Year).

Add existing data from previous version of database to the new version of the database

To house all data (*i.e.*, multiple DNR Collection Years in one database) in one database by migrating the data to the new version as they are issued. This is the recommended strategy as it will prevent inconsistencies in Station Naming and will reduce reentering Station Info for sites that are visited over multiple years. **Note: This migration is only possible with 4.x to 4.x or higher versions.**

How to migrate data from an old version (4.x) to a new version (4.x or higher)

1) Place a blank copy of the "new" version and a copy of the "original" or old version (the one with data) of the database in one location (*e.g.*, C:\DEP DNR SCP DB Transfer or Q:\DEP DNR SCP DB Transfer). **Note: Starting with version 4.03, An-Code and Latitude and Longitude in Degrees Minutes Seconds are required**

fields. Therefore, you will need to make sure that they are populated in the "original" version before attempting transfer.

2) Copy the *Transfer from 4.x to 4.x.mdb* tool provided in the zip file (downloaded from the WV DEP website or provided with the DNR Scientific Collection Permit packet) to the same folder as above.

3) Open the *Transfer from 4.x to 4.x.mdb* tool (picture below). Follow the instructions given in Orange in the tool.

Step 1:
- Press the Link Data button.
- Select all of the tables that start with the word "New".
- Make sure the "Always prompt for new location option is checked." at the bottom of the window.
- Press the OK button in the upper right.
- A window will appear for selecting the location of the New Database Version.
- Navigate to that location and select the new database by double clicking on it.
- A window will appear that says "All selected linked tables were successfully refreshed."

Step 2:
- Select all of the tables that start with the word "Original".
- Press the OK button in the upper right.

- A box will appear for selecting the location of the Original Database Version.
- Navigate to that location and select the new database by double clicking on it.
- A window will appear that says "All selected linked tables were successfully refreshed."
- Press the Close button.

Step 3:
- Press the Transfer Data button.
- The transfer of data will begin immediately followed by a table that will open showing the Original vs. New records for each of the 16 data tables.
- If this table does not open, press the Transfer Data button above again.
- Check the table for record count inconsistencies.

Step 4:
- Archive the "Original" database in a safe place and move the "New" database to the desired location.
- Close this tool.

III.   Open the Database and setup trusted locations if needed

Note: Trusted Locations is a MS Access setting and not a database setting. Each user will have to go thru these steps individually on their respective PCs/Login accounts.

Open the Database. A Main Menu tab should pop up on the screen.

Office 2010 Users

If you are using Office 2010, you may get a **Security Warning** bar that pops up on the top of the screen if you did not put the database on your C drive (see example below).
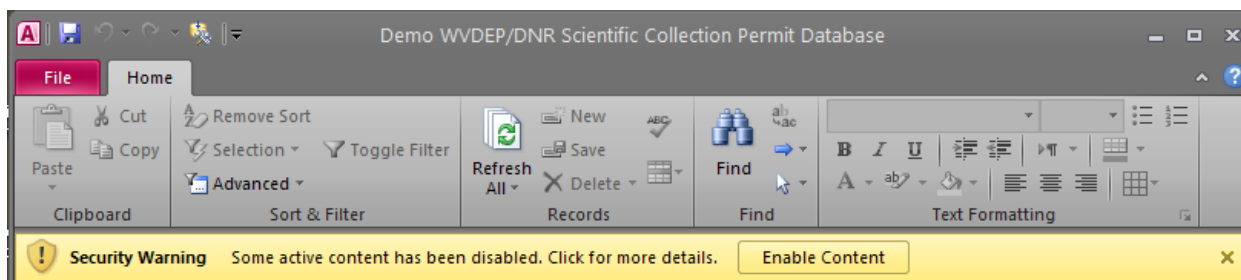
If this occurs, you will need to do one of the following:

1) Click **Enable Content**. This should permanently make the file a trusted file for that user logged into that particular computer.

2) If this does not work (as evidenced by the reappearance of the warning message above for the same user on the same PC) then:

   A. Click the **File Tab** in the upper left corner of the menu bar.

   B. The **File Tab Menu** will open. Select **Privacy Options**.
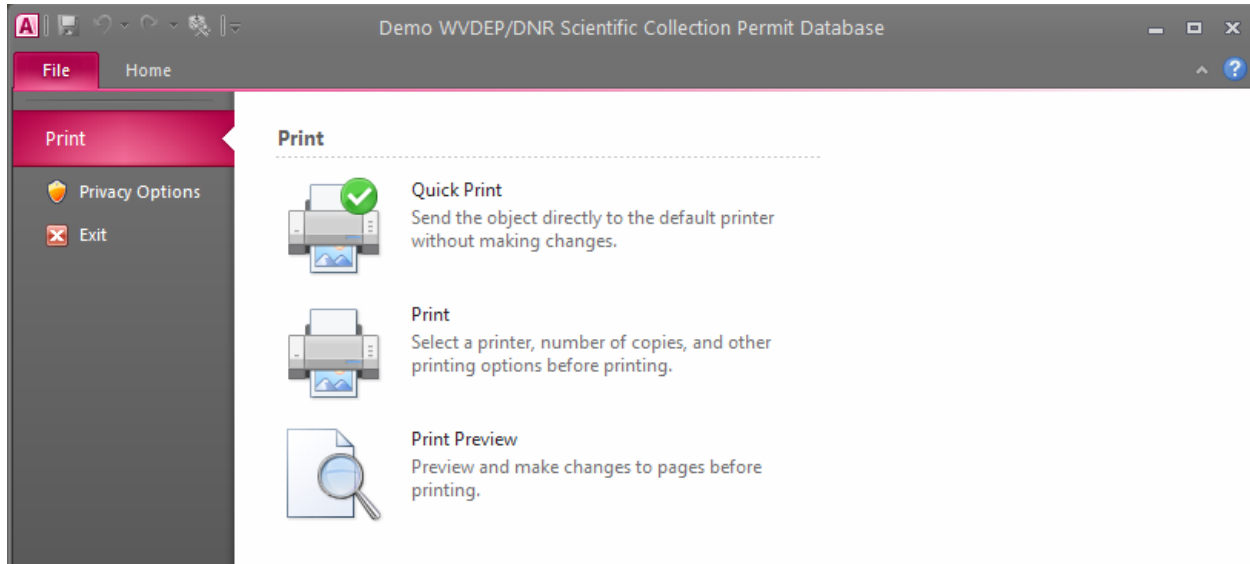
C. A window called Access Options will pop-up. Select **Trust Center** on the left.

Access Options

| General |
| Current Database |
| Datasheet |
| Object Designers |
| Proofing |
| Language |
| Client Settings |
| Customize Ribbon |
| Quick Access Toolbar |
| Add-ins |
| Trust Center |

General options for working with Access.

User Interface options

☑ Enable Live Preview ⓘ
☑ Always use ClearType
ScreenTip style: Show feature descriptions in ScreenTips ▾
       ☑ Show shortcut keys in ScreenTips
Color scheme: Black ▾

Creating databases

Default file format for Blank Database: Access 2007 ▾
Default database folder: C:\Documents and Settings\a129317\My Documents\   Browse...
New database sort order: General - Legacy ▾

Personalize your copy of Microsoft Office

User name: Michael J. Whitman
Initials: MJW

OK   Cancel

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D. The window will change to the **Trust Center** menu. Next select **Trust Center Settings** on the right.
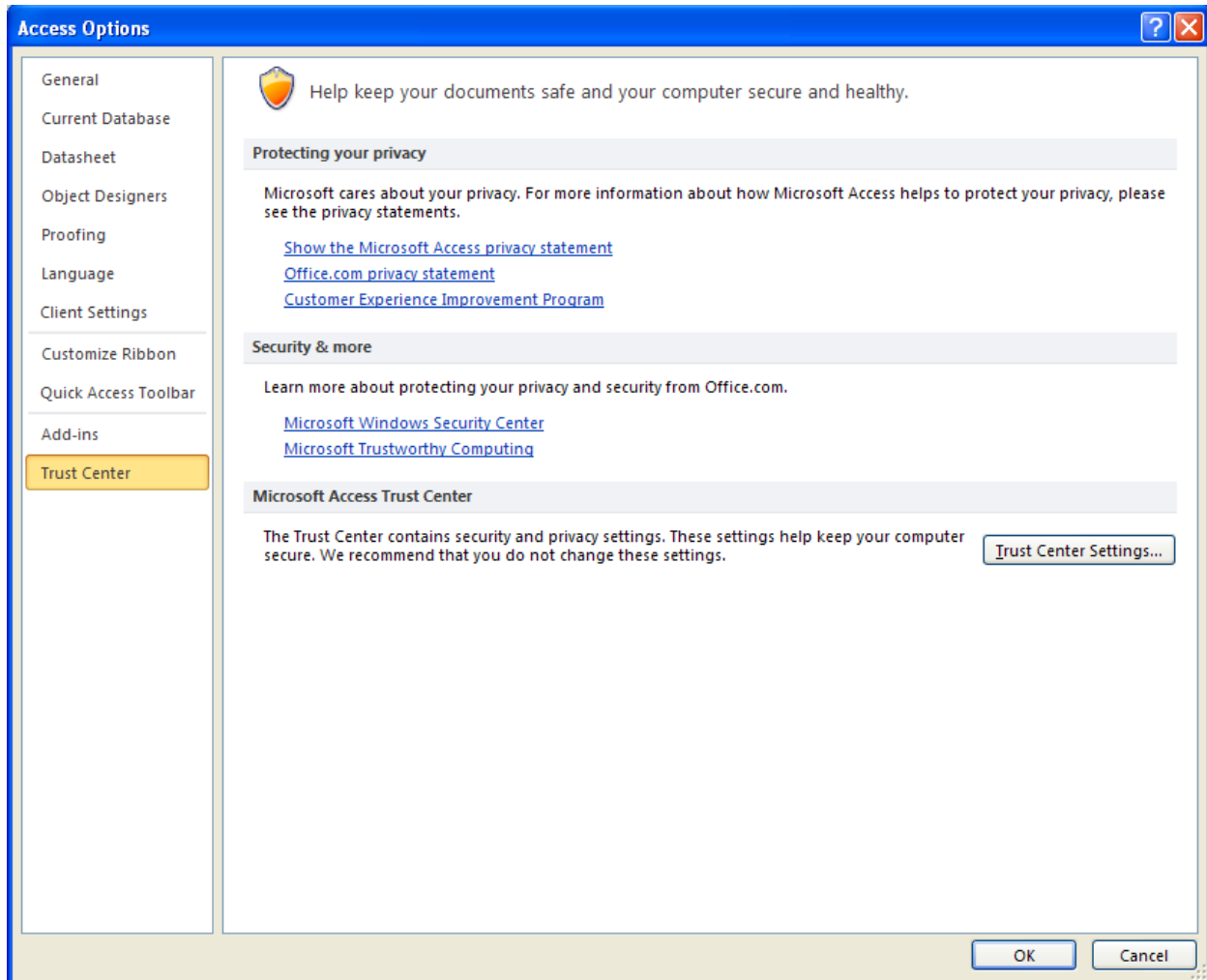
E. The **Trust Center** box will open. Select **Trusted Locations** from the left hand side.
The **Trusted Locations** panel will become visible. This is a user-specified listing of
locations that are considered safe for Macros to be used from. MS Office always
defaults the C Drive as a trusted location. **Check** the box at the bottom that says
"**Allow Trusted Locations on my network (not recommended)**" and then press the
Add new location… button.
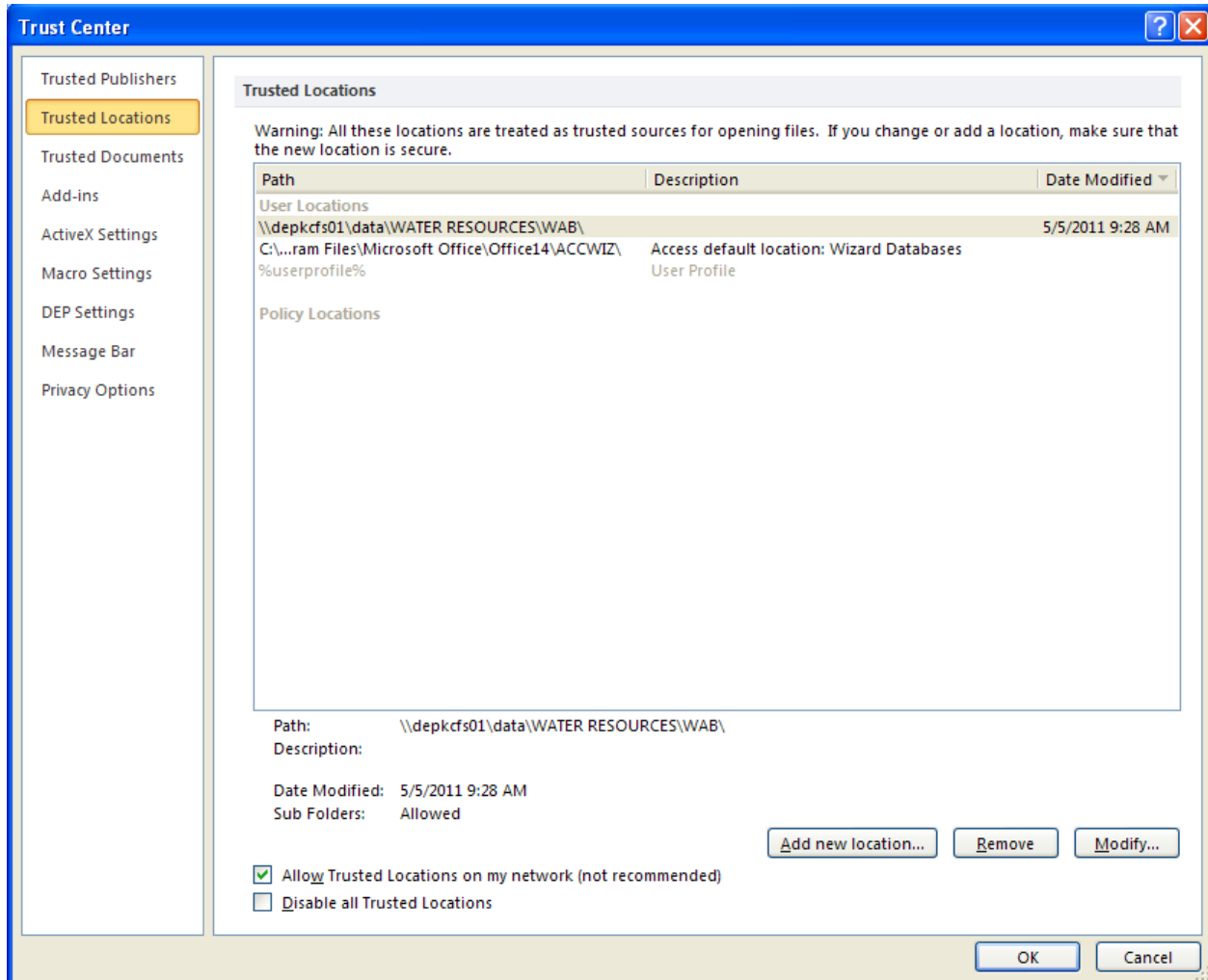
F. A box called **Microsoft Office Trusted Location** will open. From this box, press the **Browse…** button.
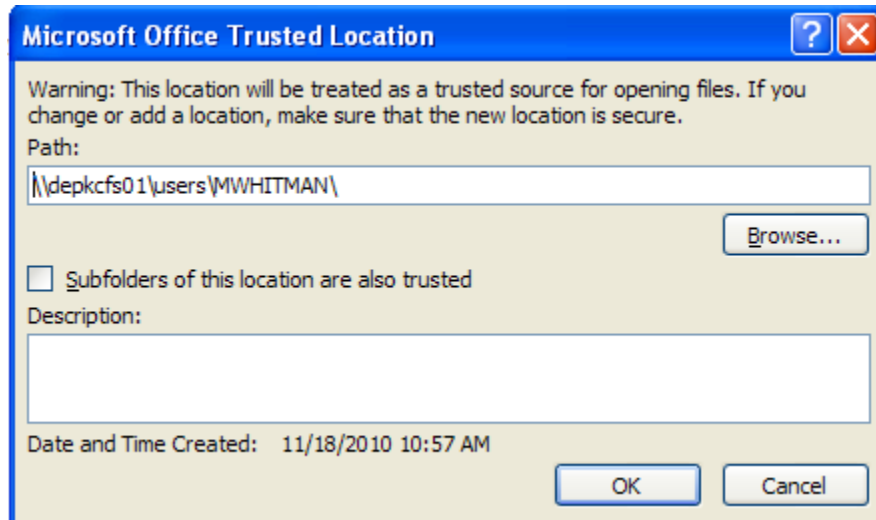
G. Locate the drive, folder, or subfolder where you have put the database and then select **OK**.
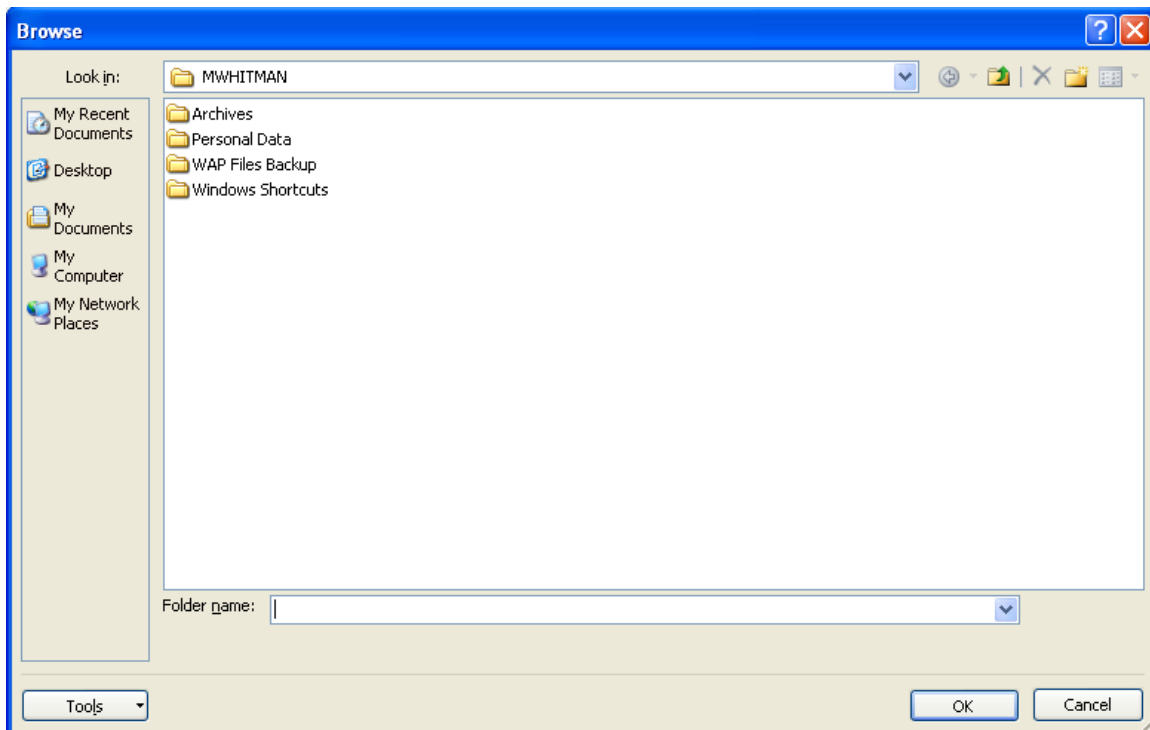
H. You will return to the **Microsoft Office Trusted Location** box. **Check** the box at the bottom that says "**Subfolders of this location are also trusted**" in the middle of the box (see above). If you wish, you may add a Description of the trusted location. Press **OK**.

I. You will return to the **Trust Center** box **Trusted Locations** panel. The trusted location you have just added should now appear in the list. Press **OK**.

J. You will now return to the **Access Options** pop-up window. Press **OK**.

K. The pop-up will close and you will still see the **Security Warning** just below the menu ribbon. Select **Enable Content**. The **Security Warning** bar at the top should now disappear. MS Access will save the settings for all future uses.

Remember: This is a MS Access setting and not a database setting. Each user will have to go thru these steps individually on their respective PCs/Login accounts.

Office 2007 Users

If you are using Office 2007, you may get a **Security Warning** bar that pops up on the top of the screen if you did not put the database on your C drive (see example below).

If this occurs, you will need to do the following:

A. Press the **Options…** button in the **Security Warning** bar.
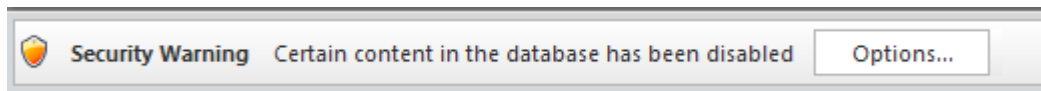
B. The **Microsoft Office Security Options** box will open. At the lower left, press the **Open the Trust Center** link.
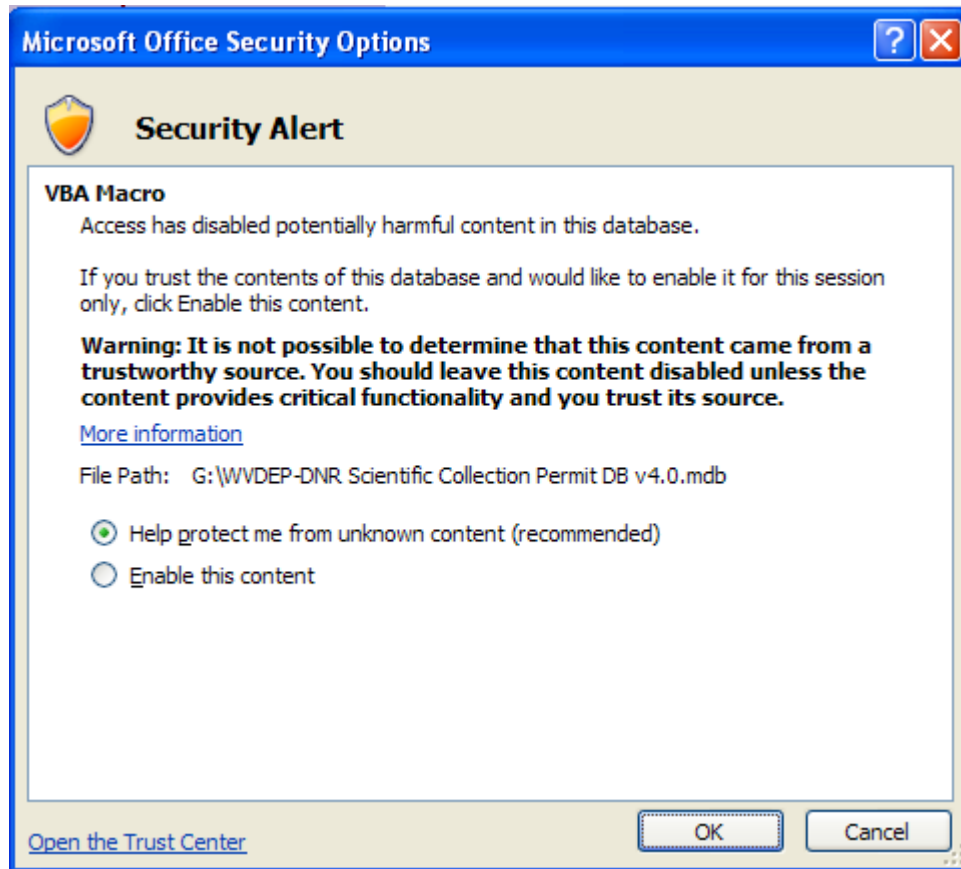
C. The **Trust Center** box will open. Select **Trusted Locations** from the left hand side.
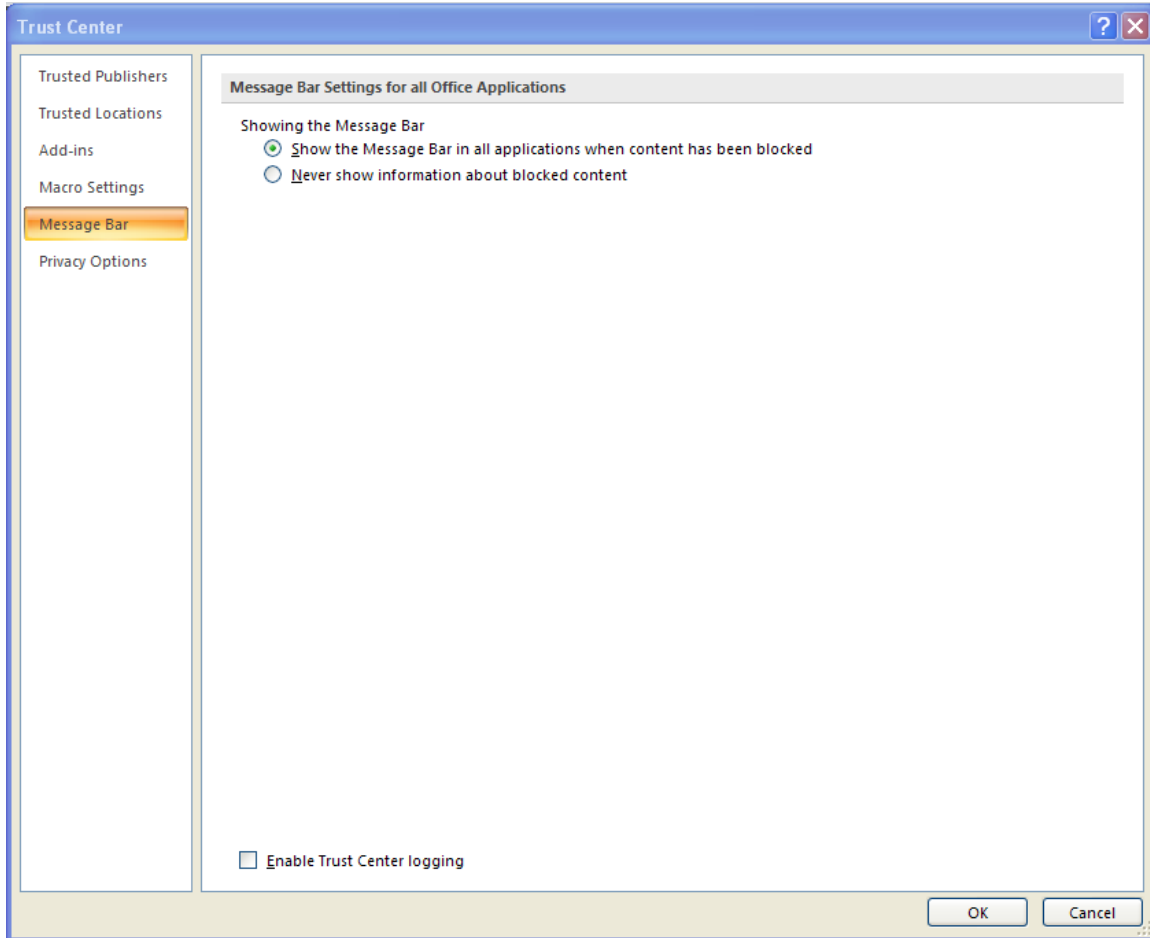
D. The **Trusted Locations** panel will become visible. This is a user-specified listing of locations that are considered safe for Macros to be used from. MS Office always defaults the C Drive as a trusted location. **Check** the box at the bottom that says "**Allow Trusted Locations on my network (not recommended)**" and then press the **Add new location…** button.
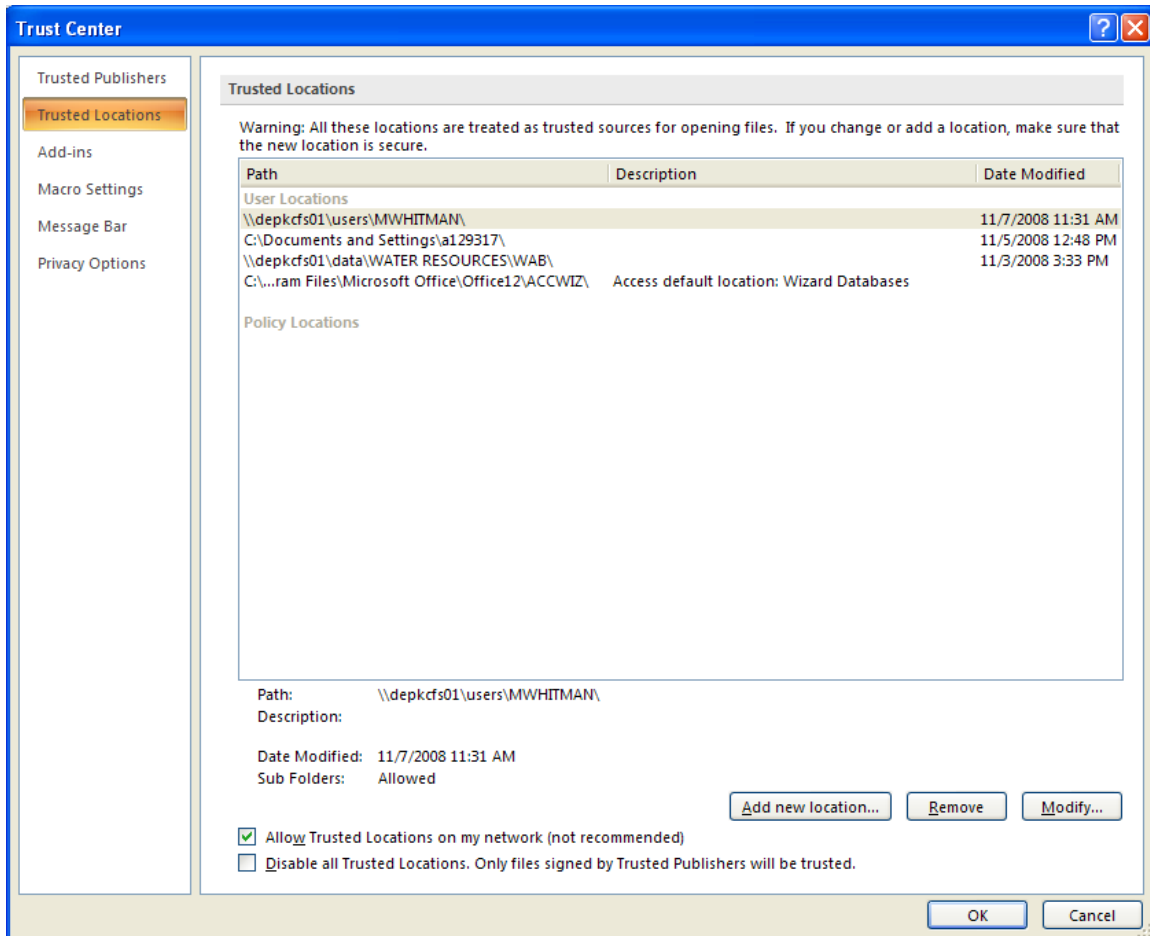
E. A box called **Microsoft Office Trusted Location** will open. From this box, press the **Browse…** button.
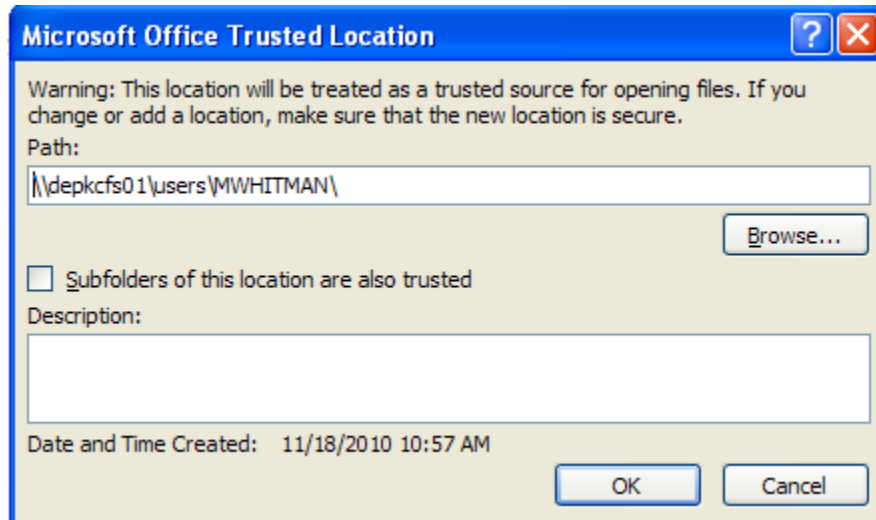
F. Locate the drive, folder, or subfolder where you have put the database and then select **OK**.
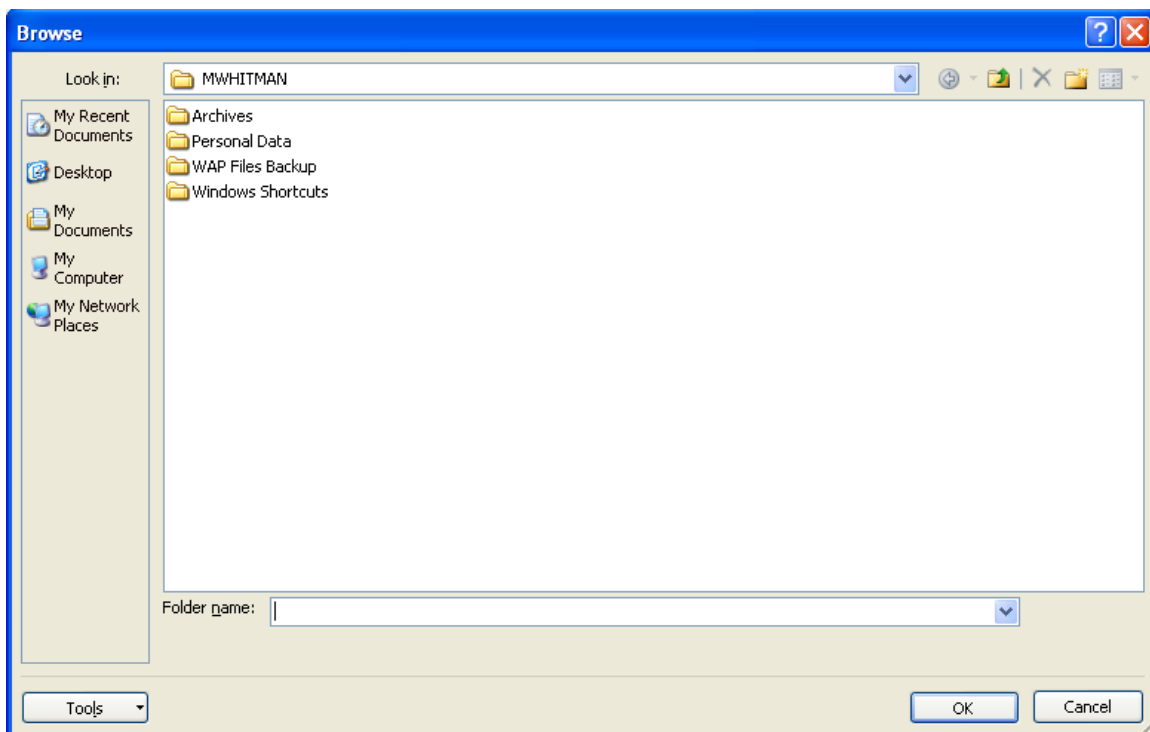
G. You will return to the **Microsoft Office Trusted Location** box. **Check** the box at the bottom that says "**Subfolders of this location are also trusted**" in the middle of the box (see above). If you wish, you may add a Description of the trusted location. Press **OK**.

H. You will return to the **Trust Center** box **Trusted Locations** panel.   The trusted location you have just added should now appear in the list. Press **OK**.

I. You will now return to the **Microsoft Office Security Options** box. **Select Enable this content** and then press **OK**.

J. The **Security Warning** bar at the top should now disappear. MS Access will save the settings for all future uses.

Remember: This is a MS Access setting and not a database setting. Each user will have to go thru these steps individually on their respective PCs/Login accounts.

Office 2003 Users

If you are using Office 2003, you may get the following warning message. This particular box can be eliminated by updating Windows and Office using the Windows Update or Microsoft Update websites.
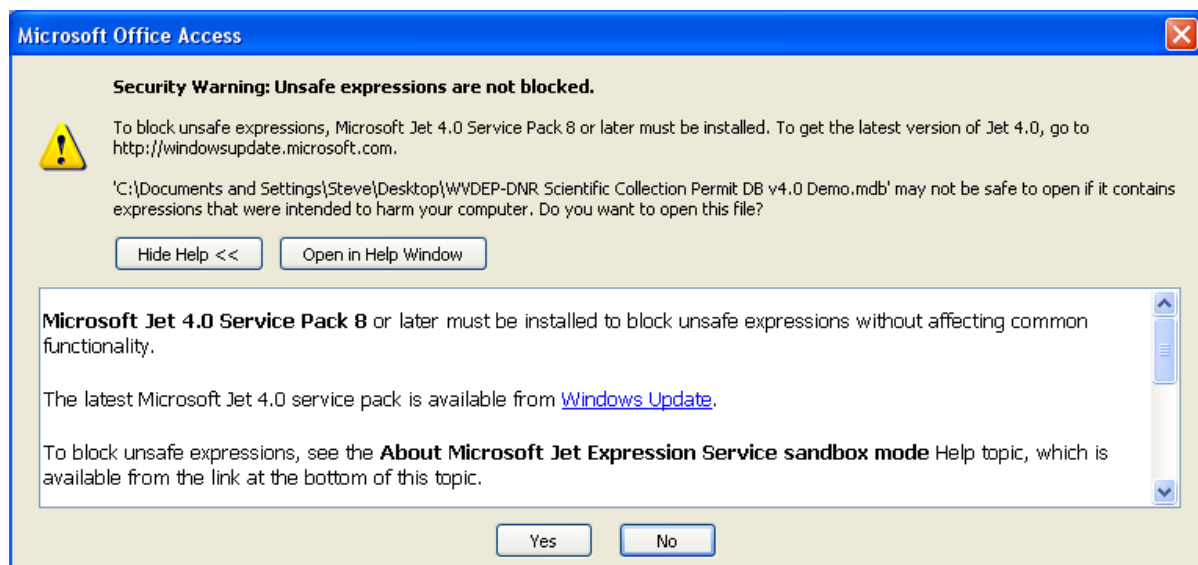
Press Yes and then the following box may appear.

Press Open.

While these warning boxes are cumbersome, they do not affect the function of the database.

Note: This is a MS Access setting and not a database setting. Each user will have to go thru these steps individually on their respective PCs/Login accounts.

IV.   Main Menu

The Main Menu consists of six command options:

1) Data Entry Form: The means by which data is put into the database.
2) Export All Data: The means by which to extract the entire database contents into multiple Excel spreadsheets.
3) Browse Projects: The means by which the project names can be browsed; for use in conjunction with the next Export Data by Project command.
4) Export Data by Project: The means by which one can extract all of the database contents related to a specific project into multiple Excel spreadsheets.
5) Organization Info: The means by which to uniquely identify your organization on all records submitted as part of the Scientific Collection Permit.
6) Exit Database: A quick shortcut to close the application

Also of note are numerous links to websites (*i.e.*, WVDEP & WVDNR), email addresses, and documents (*e.g.*, WVSCI, EPA RBP Manual, and WVDEP SOP).
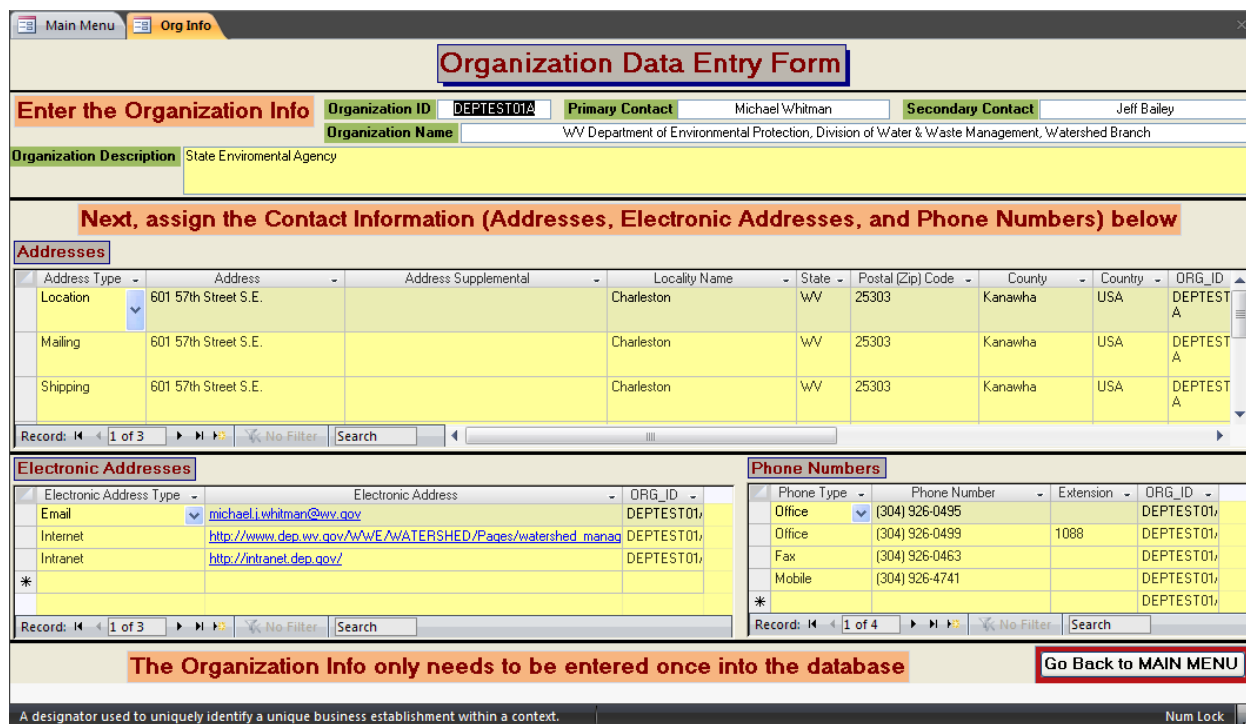
V.   Organization Info

When first using the database, it will be necessary to setup your organization's information into the database. From the *Main Menu*, select the Organization Info button.

To enter (one time only) your Organization Information
(Including Addresses, Electronic Addresses, and
Phone Numbers) select:

☐ Organization Info

A subform tab called *Org Info* will open.

Organization information includes:
1. Organization ID: unique number assigned to each organization; required
2. Organization Name; required
3. Primary and Secondary Contact Names; required
4. Organization Description; required
5. Addresses: including Location, Mailing, and Shipping; at least one required
6. Electronic Addresses: including Email, Internet, and Intranet; at least one required
7. Phone Numbers: including Office, Fax, and Mobile; at least one required

This step will occur only once when first using the database. The unique Organization ID will be stamped on all records entered into the database. This will allow all WVDNR Scientific

Collection Permit data to be housed in one master database while still allowing each organization's data to be uniquely identified.

Note that the WVDNR Scientific Collection Permit ID or number <u>does not</u> go into the Organization Info. This is because it is a number that is unique for each year of operation.

VI. Data Entry Form

Step 1.   Press the Data Entry Form button or text in the Main Menu.

To enter Station Information (Including Stream Name, Location, Coordinates, Watershed, County), Sample Data (Including Project, RBP Habitat, Benthic, Fish, and Water Quality Data) select:

☐ Data Entry Form

A subform tab called *Stations* will open.

A) Stations

Note the following button at the bottom of the screen:

Go Back to MAIN MENU

This button is present on all subforms in the database. It closes all subforms that are open and takes you back to the Main Menu when pressed.

Other similar buttons are present on all subforms in the database and allow for quick navigation between the various subforms Stations, Samples, Projects, and the data components (*i.e.*, Benthics, Fish, RBP Habitat, and Water Quality).

Also note the Record Selector at the bottom of the page that looks like this:

Record: I◄ ◄ 1 of 6 ► ►I ►* 	 ✖ Unfiltered Search

Based on how form or subform is sorted or filtered, this bar notifies you of how many records you have in a particular form, subform, or filtered subset of data. It is only present in the *Stations* and *Samples* subforms. In the screen capture of the Station subform on the previous page, note that there are 7 stations in the unfiltered database.

The *Stations* subform is where the location information about your station is entered. The subform has three parts or sections (listed from top to bottom):

1) The Search/Filtering Fields: these light blue fields at the top of the screen allow for easy navigation from Station to Station using the Find 🔍 Find ▾ , Sort ↕, and Filtering ⚡ Selection ▾ menu functions of Access.

2) The Data Entry Area: this area between the two black bars is where the location information is entered into the database

3) The Sample Preview Section: this area gives you a brief preview of any samples located at this station already entered into the database. **This box is only useful as an indicator of what is already entered in the database and is not a data entry area. Therefore it is shaded light blue as it cannot be modified; only viewed.**

Important Note: Throughout the database, if a field is shaded light blue, it cannot be modified from that control.

   Step 2.   Enter the Station Info

   a. **Add a New Station:**

   • Press the **Add New Station** button at the bottom of the screen to begin the data entry process.

   • Assigning a user-defined **unique** Station Code (25 characters) to the station. The Station Code can be anything as simple as a series of letters and numbers that represent a stream location (*e.g.*, PC-1 for Pigeon Creek Site 1; KC-1.3 for Knapp Creek at Mile Point 1.3 from the mouth; remember that these codes need to be unique for each station). The Station Code is to be used for multiple samples occurring on different dates or even the same date (*e.g.*, replicates or QA duplicates). *It is recommended that you make note of* this Station Code *on your original hardcopy data sheets for future reference.*

For DMR NPDES Permit uses (i.e, Biological Assessment Sites or BASs), the Station Code needs to be in a specific format of Permit # plus the BAS code assigned in the permit with no dashes, spaces or punctuation (e.g., WV3028593UBAS001).

- Next, fill in the associated Station Info metadata for the sample (*e.g.*, Stream Name, An-Code, Mile Point, County, Topo, *etc*.). Some of these fields are required (Highlighted in Green). Others are not required, but should be filled in (Highlighted in Gray Blue). Station Notes is for any additional information about the site (*e.g.*, specific driving/hiking directions). **Note: Starting with version 4.03, Latitude and Longitude in Degrees Minutes Seconds are required fields.**
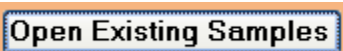
b. Or Modify an Existing Station:

- Use the search fields at the top of the data entry form or the Navigation buttons [Go to Previous Station] or [Go to Next Station] at the bottom of the screen to navigate to the appropriate Station. Make sure to match the location information to the correct Station for the given Sample.

Notes about Stations:

➢ **You cannot proceed to adding Sample Info until the Station Info (including the Station Code) is created or populated first.**
If the Stream Name and/or An-Code is not available in the lookup list, then assign an appropriate descriptive Stream Name and the An-Code of the nearest receiving stream. For example use UNT of Dies Creek and WVKC-45-H (the An-Code for Dies Creek). Should a Stream Name and/or An-Code need to be added, please contact the WVDEP Watershed Branch with the organism that needs to be amended to the ANCode Lookup list and instruction on how to update the database will be provided.
➢ **Many streams are used as physiological boundaries for Counties. Because of this, several County combinations (*e.g.*, Fayette/Raleigh, WV) are provided in the lookup list for County. It is also worthwhile to make a note about this under Station Notes. If a combination is not present, then just select one of the counties.**
➢ **If you modify the Station Code at a later date; the changes will be carried out throughout the database. However, you should avoid doing this so that the Station Code will be consistent throughout the years as the data is submitted to WVDNR.**

Step 3.   Enter the Sample Info

Press the [Open New Sample] button to add a new Sample to the Station or press the [Open Existing Samples] button to view, browse, or modify Existing Samples. A subform tab called *Samples* will open.

B) Samples

Note in the screen capture above that the Record Selector shows that there are four samples at this station.

This subform is where the information concerning a Sampling Event (a sampling event is usually defined as a unique chronological visit to a station) is entered. The subform has three parts or sections (listed from top to bottom):

1) The Station Info Fields: unlike the Stations subform, the blue fields at the top of the screen only allow for quick reference/reminder of some of the Station Information. It is not meant to be filtered, sorted, or modified in any way.

2) The Data Entry Area: this area between the two black bars is where the Date, Time, Survey Type, and Sample Notes are entered into the database.

3) The Project Assignment Section: this yellow shaded area gives you the ability to assign a sampling event to one or more projects. Projects are user-defined and can be anything from a client ID, Permit ID, or court cases ID. It is here where the WVDNR Scientific Collection Permit ID should be assigned on a sample by sample basis. Aside this, filling out the information in this area is not required as it is only useful by the user to help organize the data. However, if you wish to take full advantage of the built in queries to export data by Project, then you will want to populate and update this information frequently. *Note in the screen capture above that the Record Selector for the Project Assignments (yellow shaded area) shows that there are four projects assigned to this sample.*

a. **Add a New Sample:**

Press the [Add New Sample] button at the bottom of the screen and begin Data Entry for the Sampling Event at that particular Station by entering the following:

- Sample Date: MM/DD/YYYY or MM/DD/YY
- Sample Time: in Military Time)
- Survey Type: *e.g.*, Fish, Benthic, RBP, WQ, or any combination thereof, *etc*). The Survey Type is a user defined field that will populate a lookup box as you enter more data.
  - **Important Note:** If you have two or more samples taken at the same station on the same date/time, then each of these samples will need to be entered into the database separately. The Survey Type field can be instrumental in quickly identifying the differences between such samples. For example, QA/QC duplicate samples can be tagged with something like Dup 1 or Dup 2 to differentiate between the samples. Another example would be where multiple benthic samples were taken using different methodology where Benthic-MACS, Benthic-Kick, Benthic-Surber could be used to distinguish the samples.
- Sample Notes: *e.g.*, Notes about weather conditions during collection). The Sample Notes field would be a good location to make notes about if the sample is a replicate or QA duplicate, alternate sample IDs, *etc*.
- Once you begin to enter this data a **unique** Sample ID number will be generated for the sample. This Sample ID is a number that distinguishes the sample event from all other sample events (regardless of Station Code) and may not be reused. *It is recommended that you make note of this Sample ID on your original hardcopy data sheets for future reference.*

b. **Or Modify an Existing Sample:**

Use the Navigation buttons [Go to Previous Sample] or [Go to Next Sample] at the bottom of the screen to navigate to the appropriate Sample. Make sure to check the Station location information at the top to the correct Sample.

c. **Or go back to the Stations subform:**

Use the [Go Back to Stations] button to close the *Samples* subform and return to the *Stations* subform in order to navigate to a new Station.

Step 4.   Assign Projects to the Sample

Select which Projects you wish to assign to the Sample in the Yellow Shaded Area. You can only select from the drop down list in <u>Project Name</u>.

This drop down list will add new projects as you populate them into the database.

a. Add a New Project:

Press the [Create a New Project] button at the top of the Projects portion of the screen.

b. Or Modify an Existing Project:

Press the [Browse Projects] button at the top of the Projects portion of the screen to view existing projects.

In either case, a pop-up window called ***Projects*** will open.

C) Projects

This subform window is where the information concerning a Project is entered. The subform has two parts or sections (listed from top to bottom):

1) The Data Entry Area: this area between at the top where specific info about the project is entered into the database.

2) The Sample Preview Section: this area gives you a brief preview of any samples in the database assigned to a particular project. **This box is only useful as an indicator of what is already entered in the database and is not a data entry area. Therefore it is shaded light blue as it cannot be modified; only viewed.** *Note in the screen capture above that the Record Selector for the Sample Assignments (blue shaded area) shows that there are five samples assigned to this project.*

Step 5.   Enter Project Info

Begin Data Entry for the Project (either **New** or **Existing**) by entering the following:

- Project Name: must be unique, 50 characters or less, and cannot be repeated in the database. *It is recommended that you make note of this Project Name on your original hardcopy data sheets for future reference.* ***DMR NPDES Permit and DNR Scientific Collection Permit requirements must be followed by using the appropriate DMR NPDES Permit # (e.g., WV3028593) and DNR Scientific Collection Permit ID (e.g., 2012.08) as Project Names and assigning the appropriate Projects to those samples.***

- Project Description: *e.g.*, detailed information about the project, motivation for sampling, components, *etc*.

- Project Methods: *e.g.*, a user defined field that could be a protocol ID, biological assemblage, water quality suite, *etc*.

- Sample Frequency: *e.g.*, Daily, Weekly, Monthly, Quarterly, Seasonally, Yearly, *etc*.

- Project Dates: *e.g.*, a date range that could be a day, month, year, range of dates, *etc*.

- To navigate between existing projects or to a new project, use the following buttons at the bottom of the pop-up window:

Go to Previous Project **or** Go to Next Project **or** Create a New Project
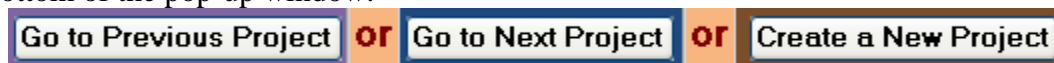
Press the Go Back to Samples button to return to the *Samples* subform and close the *Projects* pop-up window. Enter any new projects to the sample as needed (see Step 4 above).

D) Data Components (*i.e.*, Benthics, Fish, RBP Habitat, and Water Quality)

Near the bottom of the *Samples* subform tab are four buttons:

Go to Benthic Macroinvertebrate   Go to Fish   Go to RBP Habitat   Go to Water Quality

From this point on, you may select any of these and begin entry in any order. In many cases, you may only use a couple or one of them. These instructions will continue based on the order of buttons from left to right.

1) **Benthic Macroinvertebrates**

   Step 6.   Enter Benthic Macroinvertebrates Collection Information

   Press   the   button   to   begin   entering   benthic
   macroinvertebrate data.
   A subform tab called ***Benthic Collection and Comparability*** will open.

This subform is where the information concerning a Benthic Sample Collection and
Comparability is entered. The subform has three parts or sections (listed from top to bottom):
   1) The Benthic Collection Info: this area at the top is where specific info about the
      collection device and number of kicks and kick types is entered into the database.
   2) The Benthic Collection Comparability Info: this area in the middle is intended for one to
      evaluate the comparability of the sample as it applies to the IBI (*i.e.*, WVSCI). Several
      questions are displayed that should help in determining comparability.
   3) The Benthic Picking and Identification Info: this area is for keeping track of the
      information related to the processing of the benthic sample.
   o **Important Note:** If you have two or more benthic samples taken at the same station on
      the same date/time, then each of these samples will need to be entered into the database
      separately. The Survey Type field under **Samples** can be instrumental in quickly
      identifying the differences between such samples. For example, where multiple benthic
      samples were taken using different methodology, Benthic-MACS, Benthic-Kick,
      Benthic-Surber could be used to distinguish the samples in the Survey Type field.

Begin Data Entry for the Benthic Sample Collection and Comparability by entering the following (The fields are grouped by questions about the comparability of the sample that the user should consider):

Question 1: Was a suitable device used and an adequate area sampled?
- Benthic Collection Device: Kicknet or D-net. **Note: This is required for any DMR NPDES Permit activity!**
- # Riffle: The number of Riffles kicked for the benthic sample
- # Run: The number of Runs kicked for the benthic sample
- Enter Total # of Riffle/Run: The total number of Riffles & Runs kicked for the benthic sample (**Note that this value should automatically populate as you enter either the # Riffle, # Run, or both**).
- Total Area Sampled: The total area (in m^2) of substrate sampled. If using a Kicknet, this will be 0.25 m^2 x the Total # of Riffle/Run. If using a D-net, this will be 0.1108 m^2 x the Total # of Riffle/Run. This value is necessary in order to calculate the Organisms per cm^2 & m^2 on the *WVSCI* subform later on. The target for a comparable sample is 1.0 m^2.

Question 2: Are the kick velocity regimes, area, and depths adequate to get a comparable sample? : A series of questions that must be answered in order to determine if the sample is truly comparable for WVSCI calculation.
- Was benthic sample comparable with respect to riffle/run depth and velocity?
- Is there evidence that the stream channel was scoured by recent flooding or high flows?
- Is it possible that sample areas were dry or partially dry for an extended period before sample was taken?
- Is there evidence that the stream is "wet-weather" and flowing only in response to recent rainfall?

Question 3: Did the benthic collector have any major concerns about the comparability of the sample?
- Benthic Comparability Notes: Notes taken by the field crew during collection about the benthic sample's comparability.

Question 4: Was the sample collected in the April 15-October 15 index period?
- Date Collected: This field is shaded blue, which means it is not a data entry field. The information is derived from the date field on the *Sample* subform.

Additional Fields that will be useful for sample tracking and calculation of an Estimate of Benthic Density:
- Benthic Lab Sample ID: Alternate ID used by the benthic identification lab (if applicable)
- Benthic Identification Level: The taxonomic resolution used to identify the sample (*e.g.*, Family, Genus, Genus minus Chironomidae, *etc.*)
- # of grids Picked: The # of grids picked during sub sampling; this value is necessary in order to calculate the Organisms per cm^2 & m^2 on the *WVSCI* subform later on. **Note: This is required for any DMR NPDES Permit activity!**
-

- Total # of grids: The total # of grids used during sub sampling; this value is necessary in order to calculate the Organisms per cm^2 & m^2 on the **WVSCI** subform later on. **Note: This is required for any DMR NPDES Permit activity!**
- # organisms picked: The # of organisms picked during sub sampling

Notes about Benthic Sample Collection and Comparability:
➢ **Data must be entered in the *Benthic Sample Collection and Comparability* subform before any data can be entered in either of the *Benthic Final ID* subforms.**
➢ **The data entered here is important in determining the comparability and applicability of the sample relative to the WVSCI.**

How WVDEP Watershed Branch Determines Benthic Comparability

The information found in the ***Benthic Sample Collection and Comparability*** subform generally is not crucial for the actual calculation of the WVSCI. The WVSCI does not use any data in these fields and will calculate regardless of what is entered here. However, this is area is critical for the storage of important information often used when deciding whether a sample is comparable or not. WVDEP Watershed Branch takes great care during sample planning and on site before a benthic sample is taken to avoid situations where its comparability may be called into question. When it is decided in the field to go ahead with sampling, detailed notes from the sampler(s) is recorded concerning the methodology, kick depths, substrate scouring history, index period, and other factors. At some point before the benthic sample identifications are returned and entered into the database, WAB biologists will evaluate these field notes to determine whether to declare a sample as comparable or not. In the few cases where it is decided that the sample is not comparable, it will be tagged as such and the WVSCI thresholds will not be applicable. Currently, sampling outside of the index period (April to October) is the most common reason for a sample to be declared not comparable. The reason for this is that often program biologists will sample outside of the index period for special studies, surveys, or projects. In such cases, the WVSCI will still be calculated and used as a relative metric among samples (*i.e.*, the WVSCI thresholds for impairment are not considered, but rather performance relative to a control is evaluated and reported). In instances where the methodology was the reason for the sample to be declared not comparable, the WVSCI is still calculated, but only for the sake of curiosity or in the case of a special study (*e.g.*, studying the effects of a drought or flood on the benthic community's recovery time) and it is not used in any evaluations or decision processes (*e.g.*, 303d, 305b, *etc*.). **Therefore it is important to evaluate each sample for comparability (and equally so, the reasons why it is not comparable) since this will dictate the context to which the WVSCI score will be applied, if at all. For more information about Benthic Sample Comparability, consult the WVDEP Watershed Assessment SOP-Benthic Macroinvertebrate Procedures located at: http://www.dep.wv.gov/WWE/watershed/Pages/WBSOPs.aspx**

At the bottom of the ***Benthic Sample Collection and Comparability*** subform are four buttons:

| Enter Family Level Benthic IDs | Enter Genus Level Benthic IDs | View Benthic Life Histories | View WVSCI Score and Data |

Only the first two are used in data entry: The **Enter Family Level Benthic IDs** button is used when only the Family level or higher taxa have been identified as the dropdown list has been

limited to Family level or higher. The **Enter Genus Level Benthic IDs** button is used when the Genus level or higher taxa have been identified.

The remaining two **View Benthic Life Histories** **View WVSCI Score and Data** are used only to view data.

Benthic Life Histories displays some biological information (*i.e.*, Taxonomy, Tolerance Values, Habits, Functional Feeding Groups, *etc.*) about the organisms entered into the database. This information is being pulled directly from the Benthic_Taxa_Codes table (see below).

Use the **Go Back to Samples** or **Go Back to Stations** buttons to close the **Benthic Life Histories** subform and return to either the **Samples** or **Stations** subform respectively. Also, one can use the **Go back BENTHIC COLLECTION DATA ENTRY** button to return to the **Benthic Sample Collection and Comparability** subform.

Benthic WVSCI displays the calculated metrics and WVSCI score from the benthic sample. Both of these rely on a table maintained by WVDEP called Benthic_Taxa_Codes, which contains a list of all of the benthic macroinvertebrate organisms found thus far by WVDEP Watershed Branch and other agencies in the state and region at varying taxonomic levels (Phylum down to Subspecies) as well as data about Taxonomy, Tolerance Values, Habits, Functional Feeding Groups and other Life History information that may be used in metric calculations. See Step 8 below for more information about this subform.

Step 7.   Enter Benthic Macroinvertebrate Identifications

Press the either the **Enter Family Level Benthic IDs** or **Enter Genus Level Benthic IDs** button.

Either a subform window called ***Benthic Final ID (Family)***

or a subform window called ***Benthic Final ID (Genus)*** will open respectively.

These subforms are where the information concerning a Benthic IDs are entered. These subforms have only one part or section:

The Benthic Final IDs: this yellow shaded area is where specific info about the identity, count, comments, and life stage counts are entered into the database.

Begin Data Entry for the Benthic IDs by entering the following data as it was reported by the benthic laboratory:

- Final WVSCI Family: This field is locked and will not allow for data entry. Once the Benthic Final ID is populated, then the matching Family used in the WVSCI calculation (if applicable) will appear in this field.
- Final GLIMPSS Genus: This field is locked and will not allow for data entry. Once the Benthic Final ID is populated, then the matching Genus (if applicable) will appear in this field.
- Benthic Final ID: The final taxa identification of the individuals. Use Scientific Names Only. This field is a lookup field and will begin filling in as the taxon identification is typed in. Often just a few keystrokes will cue up the desired taxon. If you are trying to enter an artificial taxa (*e.g.*, Leuctridae/Capniidae) and it does not appear in the dropdown list, try reversing the order (*e.g.*, Capniidae/Leuctridae). ***This Field is required.***
  Should a taxa need to be added, please contact the WVDEP Watershed Branch with the organism that needs to be amended to the <u>Benthic Taxa Code</u> list and instruction on how to update the database will be provided.
  a) **Authority and Date are not included in the lookup list. The database also doesn't use the sp. or spp. designations.**

b) **Subgenus information (*e.g.*, Ablabesmyia (Ablabesmyia)) is available in some cases.**

c) **Artificial taxa have also been created for certain problem taxa (*e.g.*, Capniidae/Leuctridae), but it is recommended, if at all possible, to avoid the use of them.**

- Count: The number of the given taxa in the sample. Be sure that the count is the summation of all larvae, adults, and pupae that you wish to be used in the WVSCI score. Incidentally, pupae are often included in the calculation of the WVSCI score by WVDEP. *This Field is required. If no value is entered, the field will remain highlighted red.*

- Benthic Comments: Comments about the condition of the specimens (*e.g.*, Damaged, Immature, Identification tags, Missing heads, *etc*.)

- Sample Methodology: The sampling methodology used on the given taxon (*e.g.*, 200-Count Subsample vs. Whole Sample). Since the WVSCI is dependent on a 200-Count Subsample, only those entries designated as such will be used in the IBI calculation. Those not designated as 200-Count Subsample are allowed to be entered here, but will not be used in the WVSCI calculation. *This Field is required to count the organisms in the calculation of the IBI (e.g., WVSCI). If a value is entered, the field will be highlighted light green.*

- Vouchered: Were there specimens vouchered from this taxa that are no longer kept with the remainder of the sample? **Note: If one or a few, but not all individuals of a given taxa vouchered, enter the taxa twice and indicate in the count the number of specimens vouchered and the number not vouchered.**

- Larvae: The number of larvae of the given taxa in the sample. Not required, but a useful note.

- Adult: The number of adults of the given taxa in the sample. Not required, but a useful note.

- Pupae: The number of pupae of the given taxa in the sample. Not required, but a useful note.

- Exclude IBI?: This box must be checked as yes if the specimens are to be excluded from the WVSCI calculation (*e.g.*, because they are not from the 200-count subsample, terrestrial, *etc*.). *This Field is required, but auto populates as a "No". If "Yes" is entered, the field will be highlighted red because the record will not be used in the WVSCI calculation.*

Notes about Benthic Final ID Data:
- ➢ **Remember that the Benthic Final ID, Count, Sample Methodology, and Exclude IBI? fields are all required in order to calculate a WVSCI score.**
- ➢ **The Larvae, Adults, & Pupae fields may be used to keep track of the distinct life stages of a taxon found in a sample (*e.g.*, Elmidae, Psephenidae, *etc*.); these fields are not used in the calculation, so be sure that the Count field contains the correct summation of these fields if necessary!**
- ➢ **The order and size of the fields in this sub sheet can be modified by dragging and pulling columns, column boundaries, and row boundaries.**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the given ***Benthic***

Final ID subform and return to either the *Samples* or *Stations* subform respectively. Also, one can use the **Go back BENTHIC COLLECTION DATA ENTRY** button to return to the *Benthic Sample Collection and Comparability* subform.

> ### Step 8.   *View the WVSCI Score*

Press the **View WVSCI Score and Data**, from either the *Benthic Final ID (Famliy)* or *Benthic Final ID (Genus)* subform windows or from the *Benthic Sample Collection and Comparability* subform.
A subform window called *Benthic WVSCI* will open.

The *Benthic WVSCI* subform is for designed to view the final WVSCI score and component metrics as well as some estimates about the benthic density. This data can be calculated immediately after entering the data benthic identifications. The subform has three parts or sections (listed from left to right):
1) The WVSCI Family IDs and Counts: this is the area where the benthic identifications that were entered previously are collapsed into the appropriate WVSCI family. If a taxa was expected to appear in this list, check to see of one of the following things occurred:
    ✓ The taxa entered in the *Benthic Final ID (Family)* or *Benthic Final ID (Genus)* subforms is not a valid WVSCI taxa. This is apparent during the entry of the Benthic Identifications if the given taxon is entered and nothing appears in the Final WVSCI

Family field. See ***Step 7 Enter Benthic Macroinvertebrate Identifications*** above for examples of this.

Most taxa will be translated into a WVSCI family. Exceptions to this are in the following list:

Acari	Brachycera	Diptera	Malacostraca	Ostracoda
Acarina	Branchiopoda	Ephemeroptera	Megaloptera	Platyhelminthes
Anisoptera	Clitellata	Gastropoda	Mesogastropoda	Plecoptera
Arachnida	Coleoptera	Haplotaxida	Mollusca	Trichoptera
Architaenioglossa	Corbiculoidea	Hemiptera	Nematocera	Tubificina
Basommatophora	Crustacea	Lebertioidea	Odonata	Veneroida
	Cyphoderus	Lepidoptera	Odontella	Zygoptera

✓ The benthic final identification entry was not flagged as being a part of the 200-count subsample under the **Sample Methodology** field in the *Benthic Final ID (Family)* or *Benthic Final ID (Genus)* subforms.

✓ The benthic final identification entry was flagged to be excluded from the IBI. This may the case if the taxon was a terrestrial organism and it was reported anyway.

✓ The Benthic Count was not entered in the *Benthic Final ID (Family)* or *Benthic Final ID (Genus)* subforms and the WVSCI Count is highlighted red (see above).

2) The WVSCI Metrics & Scores: this area displays the six WVSCI metrics scores in both their raw and standardized forms (separated by the Best Standard Value or BSV for the metric). The standardized metrics are averaged into the final WVSCI score and an appropriate WVSCI Narrative Category is displayed (*i.e.*, Unimpaired, Gray Zone, Impaired). Also, the WVSCI score is color coded according to impairment status (Green= Unimpaired, Gray=Gray Zone, Red=Impaired) and the WVSCI Narrative Category is color coded (Dark Green=Unimpaired=Very Good, Light Green=Unimpaired=Good, Gray=Gray Zone, Yellow=Impaired-Slightly, Orange=Impaired-Moderately, Red=Impaired-Severely).

3) The Benthic Density: if the correct information is entered in previous steps (*i.e.*, # of grids picked, total # of grids, total area sampled) this area will estimate the total number of organisms per square meter kicked.

Notes about Benthic WVSCI Data:

➢ **Remember that the Benthic Final ID, Count, Sample Methodology, and Exclude IBI? fields in the *Benthic Final ID* subforms are all required in order to calculate a WVSCI score. If these are not all populated correctly, then the WVSCI score given will be inaccurate.**

➢ **All of these scores are calculated based on what is entered in the *Benthic Final ID* subforms. If you need to change this information, then use the** [Enter Family Level Benthic IDs] **or** [Enter Genus Level Benthic IDs] **buttons to close the *Benthic WVSCI* subform and reopen those subforms.**

➢ **If the *Benthic WVSCI* subform opens up with no data visible (*i.e.*, the green boxes are totally blank, then it means that you did not enter your benthic identifications in the *Benthic Final ID* subforms yet.**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the ***Benthic WVSCI*** subform and return to either the ***Samples*** or ***Stations*** subform respectively; use the

 button to return to the ***Benthic Sample Collection and Comparability*** subform; or use one of these buttons to move on to a different data class.

2) **Fish**

   Step 9.   Enter Fish Collection Information

Press the button to begin entering fish data.
A subform tab called ***Fish Collection and Comparability*** will open.

This subform is where the information concerning a Fish Sample Collection and Comparability is entered. The subform has three parts or sections (listed from top to bottom):

1) The Fish Collection Info: this area at the top is where specific info about the collection device, total shock time, number of netters, *etc*., is entered into the database.
2) The Fish Collection Comparability Info: this area in the middle is intended for one to evaluate the comparability of the sample as it applies to an IBI. Several questions are displayed that should help in determining comparability. ***Note that while WV currently does not have an IBI for fish developed, the collection protocols have been specified and should be adhered.***

Begin Data Entry for the Fish Sample Collection and Comparability by entering the following (The fields are grouped by questions about the comparability of the sample that the user should consider):

Question 1: Was a suitable device used and an adequate area sampled?
▪ Fish Collection Device: Backpack Shocker, Parallel Wires, Boat Shocker-Motorized, Boat Shocker-Floating, Floating Barge

- ▪ Total Shock Time (Seconds): The total number of seconds that electricity was applied to the stream during the sampling event
- ▪ Total Fishing Time (Minutes): The total number of minutes from start to finish (including walking between transects, *etc*.) that the fish sampling event occurred
- ▪ # Fish Netters: The total number of fish netters on site
- ▪ # Fish Shockers: The total number of fish shockers on site
- ▪ Voltage (v) : The voltage applied to the stream by the electroshockers
- ▪ Fish Reach Length (m): The total reach length sampled for fish (including inter-transect areas)
- ▪ Fish Lab Sample ID: Alternate ID used by the fish identification lab (if applicable)

Question 2: Did the fish collectors have any major concerns about the IBI comparability of the sample?: A series of questions that must be answered in order to determine if the sample is truly comparable for fish IBI calculation.
- ▪ Fish Comparability Notes: Notes taken by the field crew during collection about the fish sample's comparability. ***Indicate here any deviations from the standard collection protocols.***

Question 3: Is this date outside of the recommended IBI index period?
- ▪ Date Collected: Already populated earlier during Sample ID assignment
- ▪ Fish Season: The collection season in which the fish was collected.
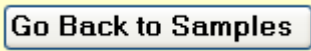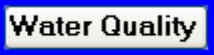
Question 4: Is the watershed size within the recommended IBI index size?
- ▪ *Note this question currently does not have any data entry fields associated with it. This may change in the future once an IBI is established.*

Notes about Fish Sample Collection and Comparability:
- ➢ **Data must be entered in the *Fish Sample Collection and Comparability* subform before any data can be entered in either of the *Fish Final ID* subform.**
- ➢ **The data entered here is important in determining the comparability and applicability of the sample relative to IBIs.**
- ➢ **Even though WV does not have a fish IBI, the above questions are still important for documenting if the data may be comparable to the standardized permit collection methodology. When an IBI is finally developed, this information will eventually be important to help determine which samples should be considered comparable.**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the *Fish Final ID* subform and return to either the *Samples* or *Stations* subform respectively. Also, one can use one of these buttons [Benthic Macroinvertebrate] [RBP Habitat] [Water Quality] to move on to a different data class.

Step 10.   Enter Fish Identifications

Press the **Enter Fish Final Identifications** button.
A subform window called *Fish Final ID* will open.

Common Name	Scientific Name	Count	Voucher	Max Fish Length (mm)	Min Fish Length (mm)	Min Fish W
Bigeye Chub (Synonym=Notropis amblops)	Notropis amblops	3				
Creek Chub	Semotilus atromaculatus	52	49			
Brook Trout	Salvelinus fontinalis					
Rock Bass	Ambloplites rupestris	6				
Saugeye Hybrid (Sander canadensis x S.vitreus)	Sander canadensis x S.vitreus					

Sample ID 5 — Enter Fish Final ID by Common Name or Scientific Name — **ORG ID** DEPTEST01A

IMPORTANT: You must enter the Fish Collection Info before entering the Fish Identifications Below!

Record: 3 of 5 — No Filter — Search

Then move on to other data types Benthic Macroinvertebrate RBP Habitat Water Quality **or** Go back to FISH DATA ENTRY FORM

or Go Back to Samples   **or** Go Back to Stations   **or** Go Back to MAIN MENU

These subforms are where the information concerning a Fish IDs are entered. These subforms have only one part or section:

The Fish Final IDs: this yellow shaded area is where specific info about the identity, count, comments, and weights and length are entered into the database.

Begin Data Entry for the Fish IDs by entering the following data as it was reported by the benthic laboratory:

- Common Name: The final taxa identification of the individuals. Use Common Names only. This Field is required.
- Scientific Name: This field will auto populate upon entry of the Common Name as a secondary check.
  Should a taxa need to be added, please contact the WVDEP Watershed Branch with the organism that needs to be amended to the Fish Taxa Code list and instruction on how to update the database will be provided.
  - **Authority and Date are not included in the lookup list. The database also doesn't use the sp. or spp. designations.**
  - **Hybrid information (*e.g.*, Saugeye (Sander Canadensis x S. vitreus) are available in some cases.**
  - **Synonyms are provided for select scientific names. If it is a synonym, then the paired common name will indicate as such (*e.g.*, Bigeye Chub (Synonym=Notropis amblops)).**

- **Count**: The number of the given taxa in the sample. ***This Field is required. If no value is entered, the field will remain highlighted red.***
- **Vouchered**: The number of specimens vouchered from this taxa that are no longer kept with the remainder of the sample.
- **Min Fish Weight (g)**: The minimum weight of the group of fish in grams.
- **Max Fish Weight (g)**: The maximum weight of the group of fish in grams.
- **Min Fish Length (cm)**: The minimum length of the group of fish in centimeters.
- **Max Fish Length (cm)**: The maximum length of the group of fish in centimeters.
- **Ind Weight (g)**: The weight in g of the individual fish in grams. Not required, but a useful note.
- **Ind Length (cm)**: The length in cm of the individual fish in grams. Not required, but a useful note.
- **DELT?**: Where there any Deformities, Erosions, Lesions, or Tumors on the fish specimen.
- **DELT Intensity**: Were the DELTs Slight, Moderate, or Heavy.
- **DELT Notes**: Notes about the DELTs observed on the individual. This would also be a good place to note any other abnormalities beyond DELTs (*e.g.*, EMAP Abnormality Codes).
- **Fish Comments**: Comments about the condition of the specimens (*e.g.*, Damaged, Immature, Sex, # Released, *etc.*).
- **Exclude IBI**: This box must be checked as yes if the specimens are to be excluded from the fish IBI calculation. This Field is required.

If no fish are collected at the site (*i.e.*, an absence of fish), then enter No Fish under the Common or Scientific Name and leave the count blank (see below). Note: This is available in version 4.03 and newer versions only.

Notes about Fish Final ID Data:
> ➢ **The order and size of the fields in this sub sheet can be modified by dragging and pulling columns, column boundaries, and row boundaries.**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the *Fish Final ID* subform and return to either the *Samples* or *Stations* subform respectively; use the [Go back to FISH DATA ENTRY FORM] button to return to the *Fish Sample Collection and Comparability* subform; or use one of these buttons [Benthic Macroinvertebrate] [RBP Habitat] [Water Quality] to move on to a different data class.

3) RBP Habitat

Step 11.   Enter RBP Habitat Information

Press the [RBP Habitat] button to begin entering RBP Habitat data.
A subform tab called *RBP Habitat* will open.

This subform is where the information concerning the RBP Habitat parameters are entered. The subform has only one part or section:

RBP Habitat Data: designed to enter the EPA Rapid Bioassessment Protocol Visual-Based Habitat Assessment Parameters recorded during the sampling event. This consists of ten

unique habitat variables scored on a 20 point scale. Three of these are evaluated on a per bank basis with 10 points maximum per bank. Ten variables are totaled for a Total RBP Score (200 points maximum) and translated into a narrative category. All total fields are calculated based on the already entered information.
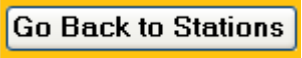
Begin Data Entry for the RBP Habitat as it was recorded by the field crews for the following parameters:

- Epifaunal Substrate/Available Fish Cover
- Embeddedness/Pool Substrate
- Velocity Depth/Pool Variability
- Channel Alteration
- Sediment Deposition
- Riffle Frequency/Channel Sinuosity
- Channel Flow Status
- Left Bank Stability
- Right Bank Stability
- Total Bank Stability*
- Left Bank Vegetative Protection
- Right Bank Vegetative Protection
- Total Bank Vegetative Protection*
- Left Bank Undisturbed Vegetative Zone
- Right Bank Undisturbed Vegetative Zone
- Total Undisturbed Vegetative Zone*
- Total RBP Score*
- RBP Narrative Score: This parameter will be calculated by the database automatically, but it needs to be populated by the user.
- RBP Habitat Notes: An area to record specific notes about the RBP parameters made by the field crews

* Fields that are calculated by the database and not entered.

Notes about RBP Habitat Data:
- ➤ **Total RBP Score or RBP Narrative Score will never be calculated without all 10 variables. When it is calculated, the Total RBP Score or RBP Narrative Score and will be color coded according to WVDEP Narrative ranges (Green=Optimal, =Sub-Optimal, Orange=Marginal, Red=Poor)**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the ***RBP Habitat*** subform and return to either the ***Samples*** or ***Stations*** subform respectively; or use one of these buttons [Go to Benthic Macroinvertebrate] [Go to Fish] [Go to Water Quality] to move on to a different data class.

4) **Water Quality**

    Step 12.   Enter Water Quality Information

Press the [Go to Water Quality] button to begin entering Water Quality data.
A subform tab called *Water Quality* will open.

This subform is where the information concerning the Water Quality parameters are entered. The subform has only one part or section:

    Water Quality Data: designed to enter any Water Chemistry or Physiochemical Parameters recorded during the sample event.   The list of parameters is maintained in the Water_Quality_Parameter_Lookup table and is pre-populated with a number of parameters already used by WVDEP. If a parameter should need to be added, contact WVDEP to add the parameter to the list.

    Should a parameter need to be added, please contact the WVDEP Watershed Branch with the parameter that needs to be amended to the Water_Quality_Parameter_Lookup table and instruction on how to update the database will be provided.
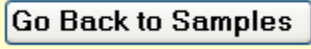
Enter the data as it was recorded in the field or reported by the laboratory. Fields provided are:
- Parameter: A   drop   down   list   based   on   Parameter   Name   in   the Water_Quality_Parameter_Lookup table. *This Field is required.*
- Non Detect: Indicates if the value was at or below the Non-Detection level. If the result is a non-detect, then the Value field should be left blank.

- Value: The numeric result. ***This Field is required. If no value is entered, the field will remain highlighted red.***
- Default Units: *Remember that the units reported by the lab may need to be converted to the default units for the given parameter as indicated in the Water_Quality_Parameter_Lookup table.*
- Water Quality Notes: Notes about irregularities that occurred during the parameter collection and analysis.
- Analysis Method: The methodology designation as determined by EPA or Standard Methods.
- MDL: The Minimum Detection Limit.
- Analysis Date: The date the analysis occurred which is important to determine if the holding time for the parameter was violated.
- Analysis Time: The time the analysis occurred which is important to determine if the holding time for the parameter was violated.
- Lab: The Laboratory that conducted the Analysis.

Notes about Water Quality Data:
- ➢ **The order and size of the fields in this sub sheet can be modified by dragging and pulling columns, column boundaries, and row boundaries.**
- ➢ **Flow (aka Stream Discharge or Q) can be documented as a water quality parameter in cfs.**

Use the [Go Back to Samples] or [Go Back to Stations] buttons to close the ***Water Quality*** subform and return to either the ***Samples*** or ***Stations*** subform respectively; or use one of these buttons [Go to Benthic Macroinvertebrate] [Go to Fish] [Go to RBP Habitat] to move on to a different data class.

> ### Step 13.   QA/QC of the database
>
> After all of this information has been entered, the data should be proofed by a different person than the one who did the data entry. Any entries in the taxonomic identification fields (Benthic Final ID or Common Name in the case of Fish) should be carefully evaluated by a seasoned biologist familiar with the subtle differences in taxa names (*e.g.*, *Thienemanniella* vs. *Thienemannimyia* vs. *Thienemannia*). In the rare instance where the taxon in question is not found in the lookup and confirmed to be accurate by an expert, please notify WVDEP Watershed Branch so that the master taxa lists (Benthic or Fish) can be updated and the newer versions returned. This should be extremely rare (especially if the target identification is at the Family level for benthics) since WVDEP Watershed Branch has already extensively sampled the entire state. Additional scrutiny should be applied to the Water Quality data to make sure that the correct parameter is being documented.
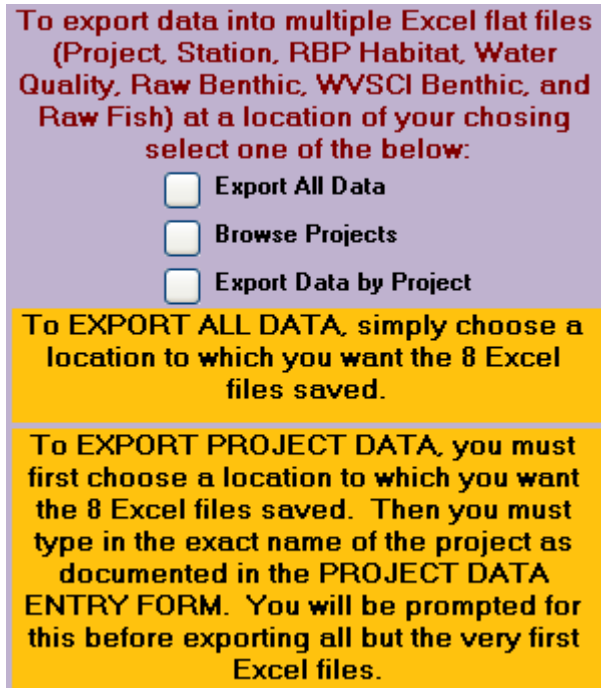
VII.   Export Data from Database into Excel files

The database is already equipped with queries and macros designed to export either all of the data or data by project into a series of seven Excel files.

A) Export All Data

Step 1.   Select from the Main Menu Export All Data

To export data into multiple Excel flat files (Project, Station, RBP Habitat, Water Quality, Raw Benthic, WVSCI Benthic, and Raw Fish) at a location of your chosing select one of the below:

☐ Export All Data

☐ Browse Projects

☐ Export Data by Project

To EXPORT ALL DATA, simply choose a location to which you want the 8 Excel files saved.

To EXPORT PROJECT DATA, you must first choose a location to which you want the 8 Excel files saved. Then you must type in the exact name of the project as documented in the PROJECT DATA ENTRY FORM. You will be prompted for this before exporting all but the very first Excel files.

A new box will appear asking to where you wish to export the excel files.
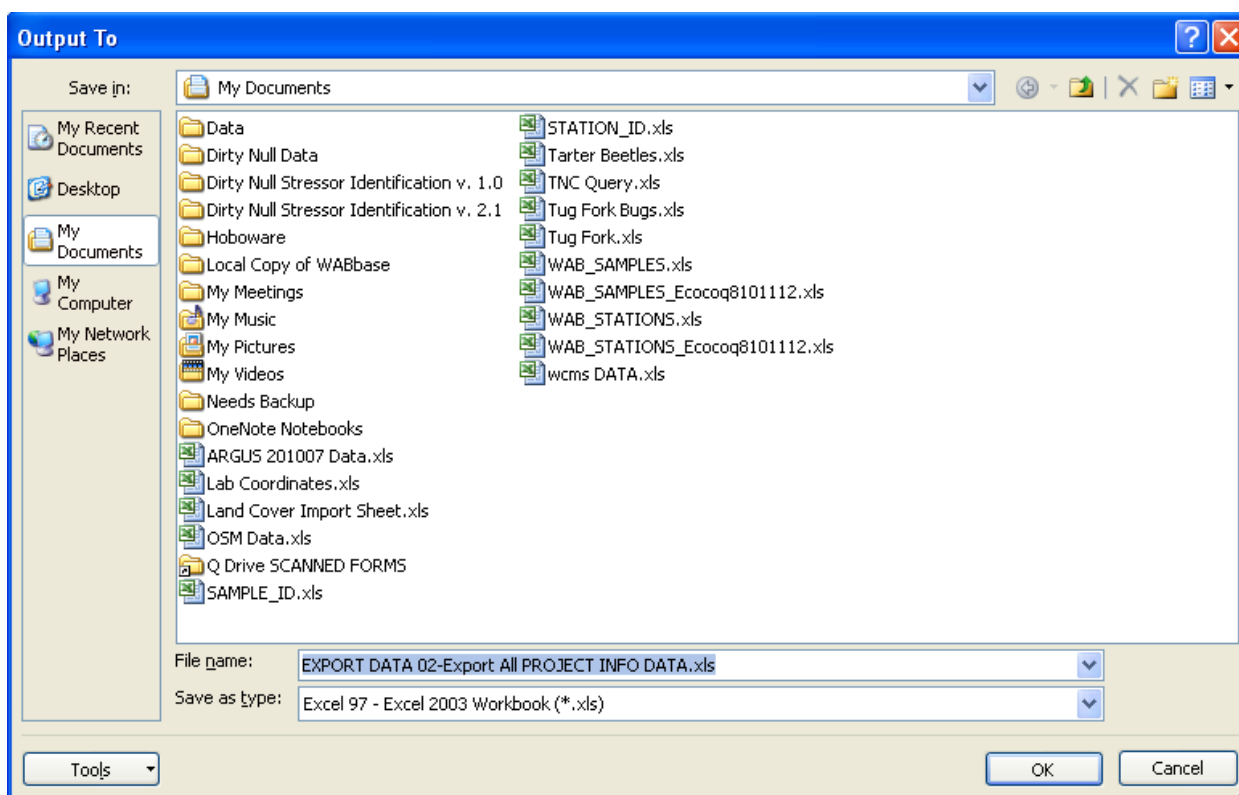
Step 2.   *Navigate to the appropriate location on your hard drive,*
Rename the file if you wish, and then hit OK.
*Note that once the destination folder is selected during the first export, you
should not have to navigate to it again in subsequent dialog boxes.*

Step 3.   *Repeat for the next seven exports.*

Step 4.   *Bundle the 8 Excel files into a folder or zip file*
Name the folder or file with the date of export and any other desired
information.

B) Export Data by Project

Step 1.   Select from the Main Menu Browse Projects

The subform window called **Projects** will open.

To navigate between existing projects, use the **Go to Previous Project** or **Go to Next Project** buttons at the bottom of the pop-up window.

Step 2.   Write down the desired <u>Project Name</u>.

Step 3.   Select from the Main Menu Export Data by Project

To export data into multiple Excel flat files (Project, Station, RBP Habitat, Water Quality, Raw Benthic, WVSCI Benthic, and Raw Fish) at a location of your chosing select one of the below:

☐ Export All Data

☐ Browse Projects

☐ Export Data by Project

To EXPORT ALL DATA, simply choose a location to which you want the 8 Excel files saved.

To EXPORT PROJECT DATA, you must first choose a location to which you want the 8 Excel files saved. Then you must type in the exact name of the project as documented in the PROJECT DATA ENTRY FORM. You will be prompted for this before exporting all but the very first Excel files.

Step 4.   Navigate to the appropriate location on your hard drive
Rename the first file if you wish, and then hit OK.
Note: This first file contains your Organization info and is not dependent on the Project identity. Therefore, you will not yet be prompted to enter the Project Name.
Reminder: D<u>o not</u> rename the file when submitting the data to WVDEP for DMR Permit reporting purposes!

Step 5.   Repeat for the next file.
Note that once the destination folder is selected during the first export, you should not have to navigate to it again in subsequent dialog boxes.

The following dialog box will appear:
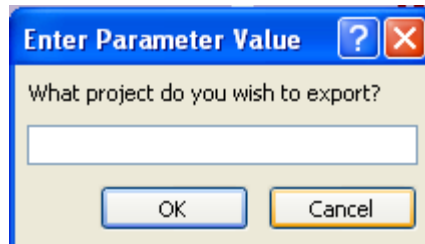
Step 6.   Enter in the Project Name

It must be exactly as it appeared in the Projects subform earlier

Step 7.   Press OK.

Step 8.   Repeat Steps 4-7 for the last six exports.

Step 9.   Bundle the 8 Excel files into a folder or zip file

Name the folder or file with the Organization ID and Project Name (e.g.,
Scientific Collection Permit ID or Permit ID) for submission to DNR or DEP.

VIII.   How Advanced Access Users can gain access to the Data Tables

Press and hold the Shift key while clicking on the link to open the Database. If a warning box pops up, keep the Shift key depressed as you click on the warning box to open the database.

When successful, the database will open looking something like the picture below with a list of the tables on the left and the Main Menu will not automatically open.
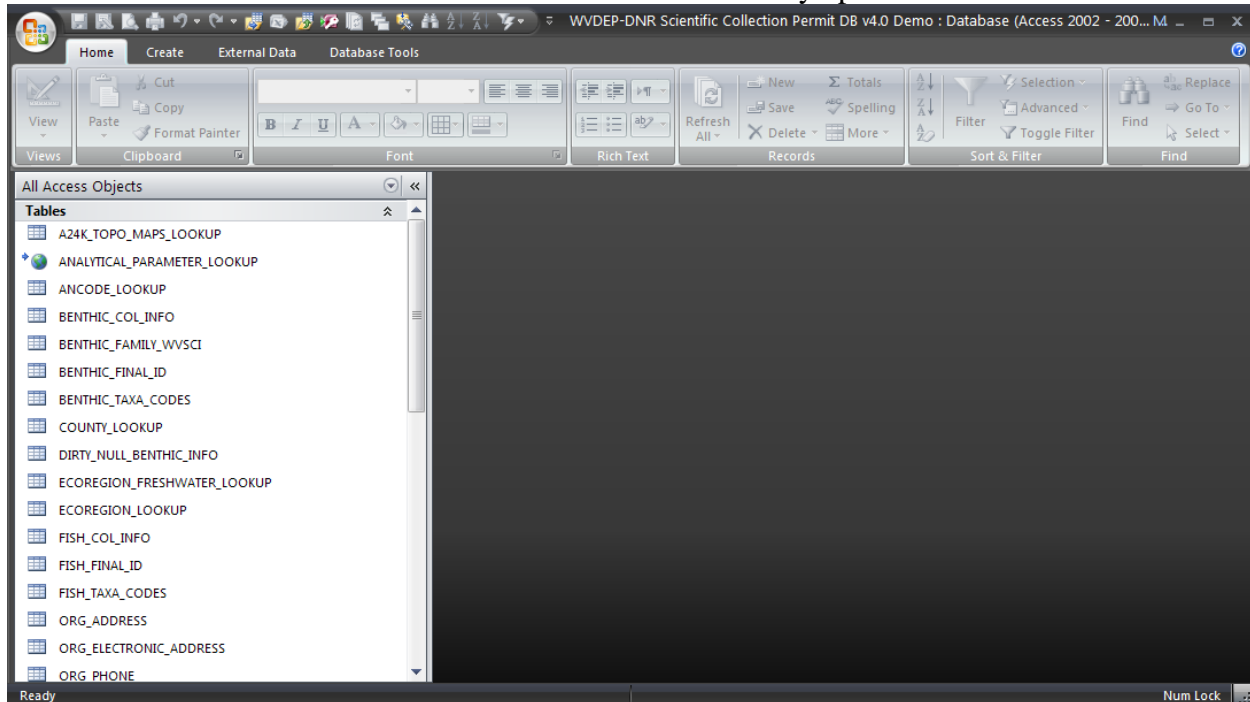
To return to the normal protected views, close the database and reopen without pressing the Shift key.

IX.   Basic Database Structure

Below is a diagram of the database structure including key fields that link tables and referential integrity relationships.

Relationships for WVDEP-DNR Scientific Collection Permit DB v4.0 Demo
Tuesday, January 04, 2011

ANCode_Lookup
ID
WAP_Stream_ID
8_digit Watershed name
Watershed Sort
Type
Master Code
Master Name
Length_Acres
date change
Notes
Local Name
Prev_RM
Other Comment
WAPbase?
Location Clue
Waterbody type
STORET_Primary_Type

STATION_INFO
Station_ID
Station_Code
ANCode
Mile_Point
Stream_Name
County
A24k_Topo_Name
Map_Location
HUC_2
HUC_4
HUC_6
Watershed
HUC_10
HUC_11
HUC_12
LEVEL_IV_ECOREGION
PHYSIOGRAPHIC_NAME
ECO_FW_NAME
POR_Lat_Deg
POR_Lat_Min
POR_Lat_Sec
POR_Lon_Deg
POR_Lon_Min
POR_Lon_Sec
POR_LON_DD
POR_LAT_DD
POR_Datum
POR_UTME
POR_UTMN
POR_UTM_ZONE
POR_Coordinate_Quality
Date_Added
Station_Notes
ORG_ID

PROJECT_INFO
Sample_ID
Project_Name
ORG_ID

Project_Lookup
Project_Name
Project_Description
Project_Methods

SAMPLE_INFO
Sample_ID
Station_ID
Sample_Date

FISH_COL_INFO
Sample_ID
Fish_Collection_Devic

FISH_FINAL_ID
Fish_Record_ID
Sample_ID
Fish_Final_ID
Fish_Count

Fish_Taxa_Codes
Alpha_Sort
Phylo_Sort
Taxa_Code
Common_Name
FINAL_WAB_ID

RBP_HABITAT
Sample_ID
EpifaunalSubstrate

BENTHIC_COL_INFO
Sample_ID
Benthic_Collection_Dev

BENTHIC_FINAL_ID
Benthic_Record_ID
Sample_ID
Sample_Methodology
Benthic_Final_ID
Benthic_Count

BENTHIC_TAXA_CODES
ALPHA_SORT
TAXA_CODE
FINAL_WAB_ID
FINAL_WVSCI_FAMILY

BENTHIC_FAMILY_WVSCI
Benthic_Family_Record_ID
Station_Code
Sample_ID

WVSCI
Station_Code
Sample_ID
Sample_Date

DIRTY_NULL_BENTHIC_INFO
TAXA_CODE
TAXA_CODE_LETTER

County_Lookup
State
County
County_State
Area

A24K_TOPO_MAPS_LOOKUP
TOPO_NAME
TOPO_STATE
TOPO_NAME_100K

ECOREGION_LOOKUP
ECOREGION_ID
LEVEL_III_ECOREGION
LEVEL_III_ECOREGION_DESC
LEVEL_IV_ECOREGION
LEVEL_IV_ECOREGION_DESC

PHYSIOGRAPHIC_LOOKUP
PHYSIOGRAPHIC_ID
PHYSIOGRAPHIC_NAME

ECOREGION_FRESHWATER_LOOKUP
ECO_FW_ID
ECO_FW_NAME
ECO_FW_CODE

WATER_QUALITY_DATA
WQ_Record_ID
Sample_ID
Non_Detect
Parameter
Value

Water_Quality_Parameter_Lookup
ID
Parameter
Fraction

ORG_ELECTRONIC_ADDRESS
ORGEA_ID
ELECTRONIC_ADDRESS
EATYPE
ORG_ID

WATERSHED_LOOKUP_2_DIGIT
HUC_2_ID
HUC_2
HUC_2_NAME

WATERSHED_LOOKUP_10_DIGIT
HUC_10_ID
HUC_10
HUC_10_NAME
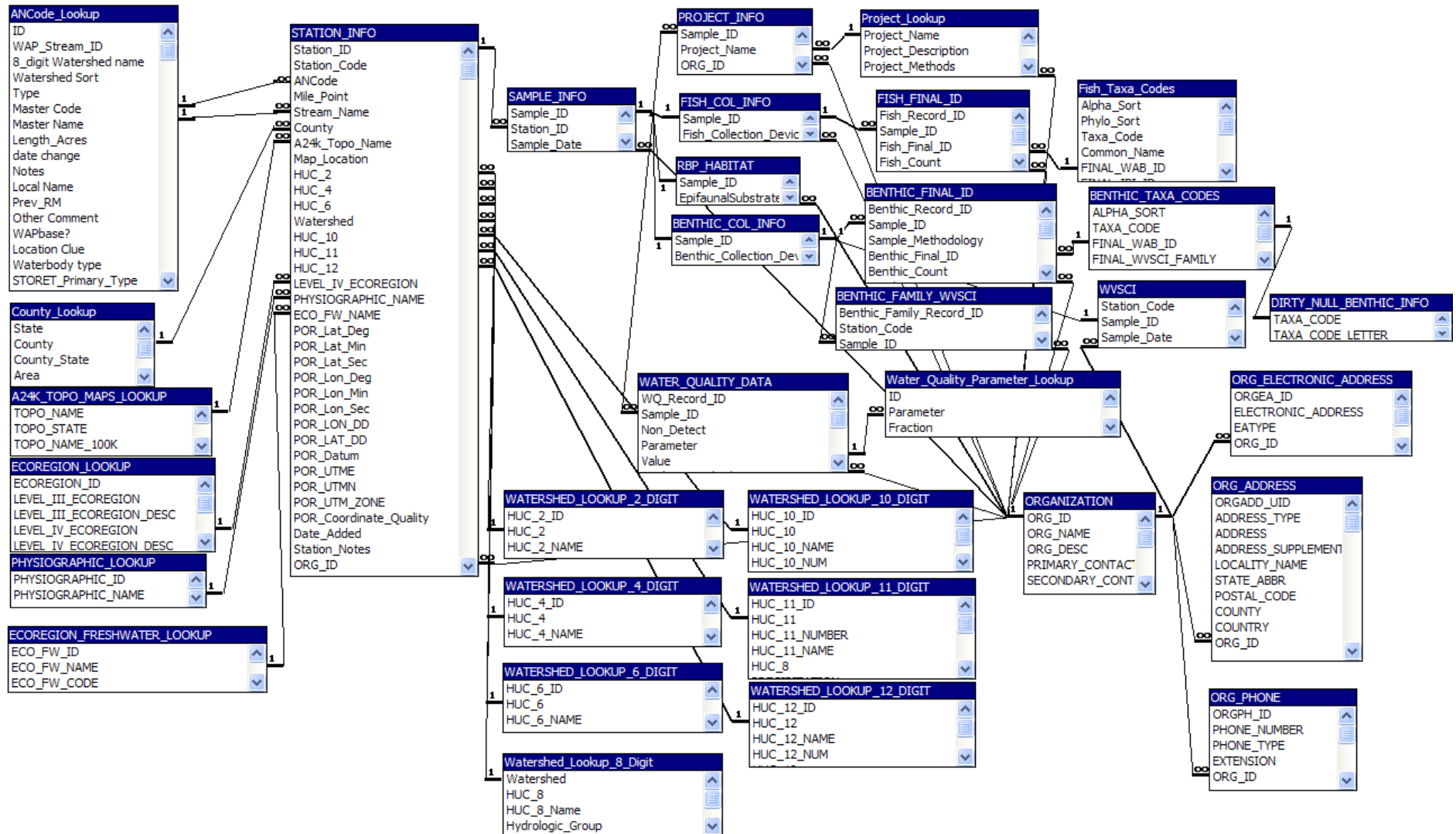HUC_10_NUM

ORGANIZATION
ORG_ID
ORG_NAME
ORG_DESC
PRIMARY_CONTACT
SECONDARY_CONT

ORG_ADDRESS
ORGADD_UID
ADDRESS_TYPE
ADDRESS
ADDRESS_SUPPLEMENT
LOCALITY_NAME
STATE_ABBR
POSTAL_CODE
COUNTY
COUNTRY
ORG_ID

WATERSHED_LOOKUP_4_DIGIT
HUC_4_ID
HUC_4
HUC_4_NAME

WATERSHED_LOOKUP_11_DIGIT
HUC_11_ID
HUC_11
HUC_11_NUMBER
HUC_11_NAME
HUC_8

WATERSHED_LOOKUP_6_DIGIT
HUC_6_ID
HUC_6
HUC_6_NAME

WATERSHED_LOOKUP_12_DIGIT
HUC_12_ID
HUC_12
HUC_12_NAME
HUC_12_NUM

ORG_PHONE
ORGPH_ID
PHONE_NUMBER
PHONE_TYPE
EXTENSION
ORG_ID

Watershed_Lookup_8_Digit
Watershed
HUC_8
HUC_8_Name
Hydrologic_Group

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X.   Database Support & Contact Info

DMR Permit Submission Requirement, General DB, and Narrative Water Quality Permit
Guidance Questions can be directed to:
Kevin D. Seagle
Environmental Resource Analyst
West Virginia Department of Environmental Protection
Division of Mining and Reclaimation-NPDES Permit Development
601 57th Street S.E.
Charleston, WV 25304-2345
Phone: (304) 926-0499 ext. 1512   Fax: (304) 926-0456
Email: kevin.d.seagle@wv.gov
Web Link:
http://www.dep.wv.gov/pio/Pages/Commentsonnarrativewaterqualitystandards.aspx

WVDEP WAB SOP and WVSCI Questions can be directed to:
Michael J. Whitman
Environmental Resource Analyst
West Virginia Department of Environmental Protection
Division of Water and Waste Management
Watershed Branch-Watershed Assessment Section
601 57th Street S.E.
Charleston, WV 25304-2345
Phone: (304) 926-0499 ext. 1088   Fax: (304) 926-0463
Email: Michael.J.Whitman@wv.gov
Web Link: http://www.dep.wv.gov/WWE/Pages/default.aspx

Scientific Collection Permit Questions can be directed to:
Barbara Sargent
West Virginia Division of Natural Resources
Wildlife Resources
Scientific Collecting Permit/Endangered Species Program
P.O. Box 67, Ward Road
Elkins, WV 26241
Phone: (304) 637-0245   Fax: (304) 637-0250
Email: barbara.d.sargent@wv.gov
Web Link: http://www.wvdnr.gov/wildlife/scollectpermit.shtm