

Final January 2013

Surface Water Field Sampling Manual - Appendix II

for water column chemistry, bacteria and flows



Photo Courtesy of Russ Gibson, Ohio EPA, DSW

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Surface Water Field Sampling Manual

Appendix II

Section A: Chlorophyll-a Sampling Procedure

Section B: Critical Cleaning Protocol for Orthophosphate Syringes

Section C: EA3 Station Module Manual

Appendix II – Section A

Procedure for Collection of Chlorophyll A

Subsection A1: Equipment List

1.a. Personal Protection

- Disposable latex gloves
- Waders

1.b. Collection

- buckets to hold at least 15 rocks
- quart cubitainers for water column sampling

1.c. Scraping

- Plastic or metal trays to collect scrapings
- Rulers (centimeter scale)
- 30 mL B-D syringes cut to make a pattern for tracing circles onto the rocks
- Pens for tracing
- Round brush tips for motorized tooth brushes glued onto pen tubes
- X-Acto knife set
- Rinsing bottles

1.d. Filtering

- Field filtration unit
- Whatman GF/C 47mm glass microfibre filters
- Tweezers
- Oxford macro-volume pipettor, 1-5 mL (plus bulb if auto-pipette not available)
- Pipette tips (lots)
- Plastic jar with lid
- Battery powered drink stirrer
- 100mL graduated cylinder
- Carboy of Nanopure for field blanks
- Carboy of distilled water for equipment cleaning
- MgCO₃

1.e. Sample Storage/Paperwork

- Aluminum Foil (plus scissors for cutting)
- Permanent Marker
- Zip-Lock bags
- Petri dishes with tape (if desired)
- Coolers with ice
- Clinometer
- Digital camera or artistic talent
- Clipboard or two
- Calculator
- Pens
- All pertinent paperwork (field sheets, sample submission forms, and clinometer form)

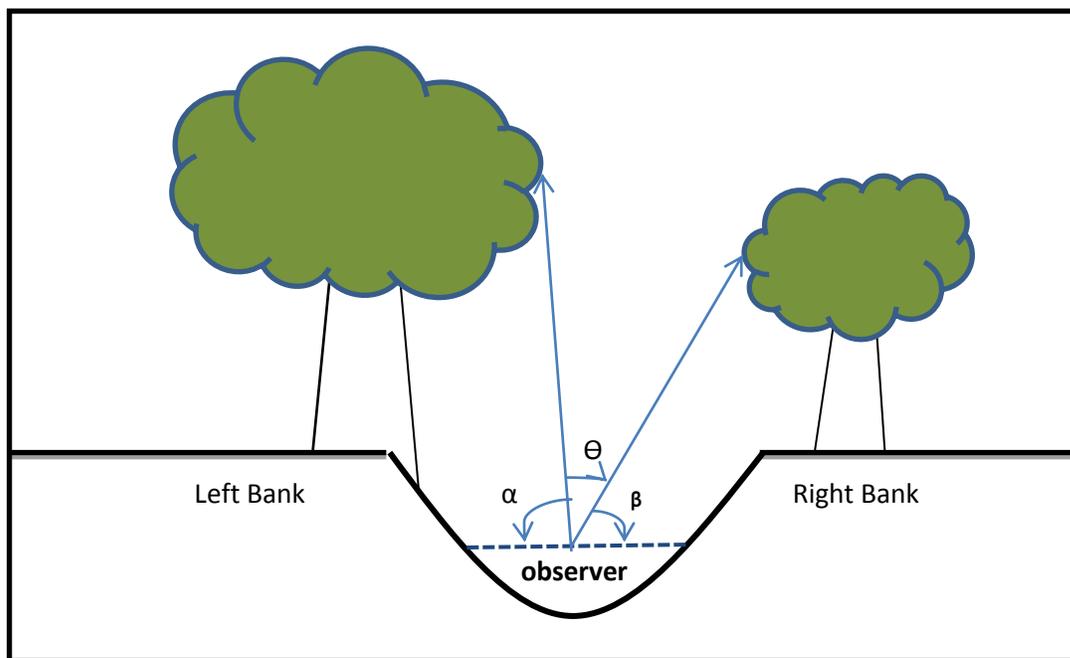
Subsection A2: Completing the Field Sheet

2.a. Clinometer Readings

- i) The purpose of these readings is to present a quantitative representation of the amount of cover provided by the riparian corridor surrounding the sample site. First, select three Chlorophyll A Sampling 2 portions of the reach being studied so that the data gathered will best represent this unique portion of the river. Focus on areas that, in your best professional judgment, portray areas of maximum, minimum, and average cover.
- ii) Standing in the middle of the river, use the clinometer to measure the angle formed by the plane of the water, the bank, and the point of maximum cover on either side of you. If no trees hang over the stream at your position, this angle will be zero whereas, if your position is completely shaded from the sun, this angle will be ninety degrees. These angles, one for each bank, are then recorded on the field sheet. Note that you will do this three times, one for each portion selected in part 1, and therefore record six angles.

Figure 1 below illustrates the geometry being employed by this procedure as well as what these observations tell us about the stream.

FIGURE 1. Method for quantifying cover. Angles alpha and beta represent the amount of cover provided by the riparian of the left and right banks respectively. Angle theta, calculated via the formula $\theta = 180 - (\alpha + \beta)$, then represents the amount of the stream that does not receive cover from the riparian.



2. b. The Rest

For the most part, the rest of the field sheet is fairly self-explanatory. Field personal should use best professional judgment when making such qualitative observations such as flow, turbidity, substrates, substrate origin, etc. If any such observations require a written explanation, do not hesitate to provide one. As for the stream drawing section of the worksheet, digital photographs of the reach being studied provide a more accurate and often easier means of recording the site.

Subsection A3: Preparation of Field Blanks

3.a. - Field Blank Requirements

Sample collection at each site should be supplemented by at least a water column and a periphyton field blank. If water chemistry samples are collected, additional blanks may be required.

3.b. - Equipment Cleaning

Care must be taken that all required equipment is properly cleaned prior to the preparation of field blanks and collection of samples. If possible, soap (non-phosphate) and tap water should be used on all equipment followed by a distilled water rinse. In the field, where such cleaning is impossible, a generous distilled water rinse will suffice and must be done between each site.

3.c. - Water Column Field Blank

- i) Pour Nanopure water into the cleaned container that will be used to collect river water for filtration. Cap the container, if the lid will be used in the sample collection, and shake.
- ii) Assemble the filtration unit. Note that gloves and tweezers **MUST** be used whenever samples or filters are being handled to prevent contamination.
- iii) Measure out 100 mL of the Nanopure water and run it through the filter.
- iv) Carefully fold the filter in half and wrap it in aluminum foil. Label the foil with a number 8 and place the blank into the container that will hold the water column samples. Finally, put the blank on ice in the cooler.

3.d. - Rock Scraping Field Blank

- i) Pour Nanopure water into one of the trays that will be used to collect the rock scrapings.
- ii) All instruments that will be used in the collection of the periphyton samples, such as knives, brushes, and stirrers, must contact this Nanopure water so that the equipment blank will accurately reflect any contamination from these devices.
- iii) Assemble the filtration unit. Note that gloves and tweezers **MUST** be used whenever samples or filters are being handled to prevent contamination.
- iv) Use the pipette to collect 5 mL of the Nanopure water in the tray. Run this sample through the filter. Note that each pipette tip can only be used with the preparation of one blank or one sample.
- v) Carefully fold the filter in half and wrap it in aluminum foil. Label the foil with a number 4 and place the blank into the container that will hold the water column samples. Finally, put the blank on ice in the cooler.

Subsection A4: Preparation of Water Column Samples

4.a. - Collection of the Sample

The sample collector must first wade out to a representative portion of the stream or river being studied. Gloves should be worn and water should be collected upstream of the collector to prevent any contamination. Allow any disturbed sediment to settle prior to the collection of the sample to ensure that the water collected is indeed representative of the stretch.

4.b. - Filtering the Sample

- i) Gloves must be worn during all parts of this procedure. Do not use the same pair of gloves as those used to acquire the sample in the river.
- ii) Measure out 100 mL of the collected water and filter. Always use gloves and a pair of tweezers when handling the filters.
- iii) Carefully fold the filter in half and wrap it in aluminum foil.
- iv) Repeat the above two procedures twice so that three filters are prepared.
- v) Label the wrapped samples 5, 6, and 7 and package them in the same container as the water column field blank, number 8. Put this container back into the cooler.

Subsection A5: Scraping the Rocks

5.a. - Collecting the Rocks

When collecting the rocks, the collector's primary focus must lie on achieving a solid representation of the river or stream at that site. A diversity of rocks should be collected so that every aspect of the site is represented. Note that a minimum of 15 rocks is required per site. Avoid focusing on one area but rather see to it that the entire site is covered. The actual collection procedure is little more than wading to a given portion of the site, reaching down, and randomly selecting a rock to be sampled.

5.b. - Scraping the Rocks

- i) When deciding what area on the rock to scrape, bear in mind that the goal is to acquire a representative sample of the algal growth on the rock wherever such growth is possible. As such, avoid regions where the rock was buried and regions where the growth is extreme.
- ii) Perhaps the most important aspect of the whole procedure is making sure that the area scraped is known. Therefore, the collector should begin his work by inscribing a circular boundary onto the surface of the rock. Care must be taken to make sure that any material removed from the rock by the process is collected into the pan.
- iii) If large plant fibers are present within the sample site, remove these first. Use best professional judgment to decide which portions of the algae belong within the sample area and which are outside the boundary. Large fibers should be diced up within the pan as much as possible.
- iv) Use a knife (flat edge knife best at this phase) and brush to remove material from the area being sampled. All such material should be collected in the pan used to prepare the blank. A squirt bottle filled with distilled water is often useful here, especially with the brushes.
- v) Use care when washing the cleaned area with the squirt bottle to avoid contaminating the sample with material outside the boundary. If the surrounding surface is covered with loose sediment, such a rinse may prove impossible.
- vi) Use best professional judgment to determine when a given rock has been sufficiently cleaned.
- vii) Measure and record the diameter of the area scraped. If this region ends up sprawling outside of the original bounds, make several "diameter" measurements and average.

5.c. - Filtering the Sample

- i) Transfer all material collected in the pan into a plastic jar. Use the spray bottle to make sure that nothing is left behind.

- ii) Use an electric stirrer to thoroughly mix the sample and prevent sediment from settling to the bottom.
- iii) Wearing gloves, use the pipette to acquire a 5 mL aliquant of the sample. Continue to stir the sample while using the pipette.
- iv) Filter the aliquot, carefully fold the filter in half, and wrap it in aluminum foil. Always use gloves and tweezers when handling the filters.
- v) Repeat the above two steps twice so that a total of three filters are collected. Label the wrapped samples 1, 2, and 3 and place them in the same container as the sample blank labeled 4. Return this container to the cooler.
- vi) Measure the total volume of scrapings collected and record. Remember to take into account the 15 mL of filtered sample.

Subsection A6: Sample Storage, Labeling, and the Lab

6.a. - Sample Storage

The wrapped filters should be kept on ice as much as possible prior to their release to the lab. The water column filters and the rock scraping filters should be stored as two distinct groups as described above. The container used to hold them could be anything from a petri dish to a zip-lock bag as long as it is, or can be made, water proof. If petri dishes are used, they should be taped shut around the side and placed in a zip-lock bag while being transported in the cooler.

Periphyton Sample for Chlorophyll_a Field Sheet																										
STORET Station: _____		Date: _____		Time: _____		Name: _____																				
RiverCode: _____		RM: _____		Location: _____																						
Lat _____		Long _____																								
Composite		Number of Rocks		Total Area Scraped:		cm ³																				
Diameter of Individual Scrape		Area of Individual Scrape																								
1		1		<table border="1"> <thead> <tr> <th colspan="2">Diameter to Area Conversion</th> </tr> <tr> <th>Diameter (cm)</th> <th>Area (cm²)</th> </tr> </thead> <tbody> <tr> <td>1.6</td> <td>2.011</td> </tr> <tr> <td>1.7</td> <td>2.27</td> </tr> <tr> <td>1.8</td> <td>2.545</td> </tr> <tr> <td>1.9</td> <td>2.835</td> </tr> <tr> <td>2.0</td> <td>3.142</td> </tr> <tr> <td>2.1</td> <td>3.464</td> </tr> <tr> <td>2.2</td> <td>3.801</td> </tr> <tr> <td>2.3</td> <td>4.155</td> </tr> </tbody> </table>			Diameter to Area Conversion		Diameter (cm)	Area (cm ²)	1.6	2.011	1.7	2.27	1.8	2.545	1.9	2.835	2.0	3.142	2.1	3.464	2.2	3.801	2.3	4.155
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10		10																								
11		11																								
12		12																								
13		13																								
14		14		Total Sample Volume = _____ ml																						
15		15																								
16		16	Sample No. _____	Volume = _____	ml	Filter 1																				
17		17	Sample No. _____	Volume = _____	ml	Filter 2																				
18		18	Sample No. _____	Volume = _____	ml	Filter 3																				
19		19																								
20		20	Field Blank No. _____	Volume = _____	ml																					
21		21																								
22		22																								
23		23																								
24		24																								
25		25																								
		Total																								
Flow	None	Low	Normal	Elevated	High																					
Turbidity	Clear	Low	Moderate*	High*																						
*explain																										
Sky	Overcast	Cloudy	Partly Cloudy	Mostly Clear	Clear																					
Canopy	Open	Mostly Open	Partly Closed	Closed																						
Riparian	None	Narrow L R	Moderate L R	Wide L R																						

Appendix II - Section B

Critical Cleaning Procedure For Orthophosphate Sampling Syringes*

Critical cleaning procedure for ortho-P syringes:

1. Fill a warm water bath with enough water to cover a batch of syringes.
2. Add “Liqui-Nox” (or other **non-Phosphorous** detergent) per directions on package.
3. Pull plungers out of syringes and add both to bath.
4. Use small brush to scrub out the inside of all syringes, 5-10 sec apiece. Suck up detergent solution with syringes and squirt out.
5. Rinse once with DI water (or out-of-date nanopure) to remove detergent.
6. Rinse inside of syringes 1x thoroughly with squirt bottle of 10% HCl.
7. Triple rinse with DI.
8. Lay on clean drying rack and cover with clean paper towels until dry.
9. After about one day place the clean, dried syringes in labeled Ziploc gallon bags.

Clean and re-use up to a maximum of **three** times.

***DO NOT USE THIS PROCEDURE WHEN DOING LOW-LEVEL ORTHO-PHOSPHORUS TESTING – ONLY NEW, CLEAN SYRINGES SHALL BE USED FOR LOW LEVEL TESTING.**

Appendix II - Section C

EA3 Station Module Manual

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OVERVIEW OF “STATIONS” in EA3

Stations describe sampling locations. Sometimes stations represent sampling at a single location, while other times two or more nearby sampling locations are linked together to form a station. Stations are displayed in EA3 on 2 types of screens, one containing basic station information referred to as the “main” station screen, and one “detail” screen for each sampling point linked together in the station.

One screen required for each station is the “main” screen. The upper portion shows basic station information:

View Station

My Applications: Home, Sites, Projects, Fish, Bugs, Assessment

EA3: List, Search, New, Edit, Help

Station F01S17 Status: Complete
 Last updated by: SIM201 on 06/03/2005 at 06:50:36 PM

Name: CUYAHOGA R @ FULLER PARK UPST KENT WWTP
Type: River/Stream **Established:** 10/23/1972

Stream Code: 19-001-000 **Basin:** Cuyahoga River
Ecoregion: Erie/Ontario Lake Hills & Plains **Water Depth:** Unknown
Reference Site: No **ZID Relation:** Does not apply

Aquatic Life Use: Warmwater Habitat **Recreational Use:** None
Antidegradation Use: General High-Quality Water

Agricultural Use: Unknown **Industrial Use:** Unknown **Public Water Supply:** Unknown
Cold Water: No **Seasonal Salmonid:** Unknown **State Resource Water:** Unknown

Attachment: <none>

Point of Record:

Name	Latitude/Longitude	HUC	River Mile	County
<none>	41° 8' 57.84" N, 81° 22' 3.0" W	04110002 030 010	54.32	Portage

Other Sampling Points:

Name	Type	#	Latitude/Longitude	River Mile	County
<none>	Sampling	1	41° 8' 56.04" N, 81° 22' 6.96" W	54.2	unknown
<none>	Sampling	2	41° 8' 57.84" N, 81° 22' 3.0" W	54.3	unknown
<none>	Sampling	3	41° 9' 0.0" N, 81° 21' 56.88" W	54.4	unknown

Near the bottom of this screen, note in the red circle the hyperlinks to the “detail” screens for all sampling points linked to this station. Every station must have one detail screen for its “Point of Record” sampling point. Detail screens for “Other Sampling Points” are optional and exist only if additional sampling has occurred nearby and is

to be considered part of the same station. All sampling points that have ever been sampled for chemistry, bugs, fish, sediment, tissue, and QHEI are listed, though at first we'll be entering data into EA3 for results from only our bugs, fish, and chemistry sampling. To see the detail screen for the Point of Record or one of the Other Sampling Points, click on the associated "<none>" in the Name column at the left.

Here's an example of the detail screen for a Point of Record – this is the other screen required for each station:

View Location

My Applications | Home | **Sites** | Projects | Fish | Bugs | Assessment

Station | List | Search | Help

Unnamed Location for Station F01S17
Last updated by SIM201 on 06/03/2005 at 06:50:36 PM

Type: Point of Record

Latitude/Longitude
Degrees: 41° 8' 57.84" N, 81° 22' 3.0" W **Determined:** unknown
Decimal: 41.1494, -81.3675
HUC-14: 04110002 030 010
River Mile: 54.32 **Drainage Area:** 293.0 sq. mi.
Hydrologic River Mile: 1187.93 054.32
Lacustuary Position: Above lacustuary
Primary County: Portage **Great Lake Location?:** No
Secondary County: none
Geopositioning
Datum: North American Datum 1927 **Method:** Interpolation-Map
Scale: 1:24000

Ohio EPA
Powered by ITS Programming

Note in the red circle near the top that this screen displays the Point of Record for station F01S17.

This screen displays the lat/long and river mile for this particular sampling location (RM 54.32), but also contains a couple of fields that really describe the station in general rather than this point in specific, such as HUC-14 and County. HUC-14 and County are listed only once for each station, but are recorded and displayed here on the Point of Record screen instead of the "main" station screen.

Here's an example of the detail screen for an "Other Sampling Point." These are optional and will not occur for every station:

View Location

My Applications | Home | **Sites** | Projects | Fish | Bugs | Assessment

Station | List | Search | Help

Unnamed Location for Station F01S17 Sequence #1

Last updated by SIM201 on 06/03/2005 at 06:51:20 PM

Type: Sampling

Latitude/Longitude

Degrees: 41° 8' 56.04" N, 81° 22' 6.96" W **Determined:** unknown

Decimal: 41.1489, -81.3686

HUC: unknown

River Mile: 54.2 **Drainage Area:** 293.0 sq. mi.

Hydrologic River Mile: 1187.93 054.20

Lacustuary Position: Above lacustuary

Primary County: unknown **Great Lake Location?:** No

Secondary County: none

Geopositioning

Datum: North American Datum 1927 **Method:** Interpolation-Map

Scale: 1:24000

Note in red near the top that this screen displays a Sampling point for station F01S17, and that it is "Sequence #1." This means it is Sampling point #1 for F01S17. There can be up to 99 sampling points for a single station. We could have chosen to use the Name field to distinguish between these sampling points, such as "Bug Location for F01S17" or "Chemistry Location for F01S17". But because we can store any type(s) of results at a sampling point (including a mixture of sampling types, sometimes from various years), we've chosen not to name them. So they are all called "Unnamed Location" and are distinguished only by their Sequence number and, more importantly to us, by their River Mile. By the way, while not actually displayed on any of these screens, the Point of Record is always assigned Sequence #0 – you will see this in some of the station lists and utilize it as a search criterion in station queries.

Since HUC and County are displayed on the Point of Record screen only, you'll see they display here as "unknown."

DO I REALLY NEED A NEW STATION?

Creating new stations completely and correctly is very important – it will affect all subsequent data users in many ways. But one of the most important hurdles to cross first is to decide if you really need a new station at all.

Because of the relational database structure in which we are storing our station information, creating one new station prompts the addition of bits of information to many fields in many linked tables. Deleting a station is therefore also not a simple matter – records must be deleted back out of many tables carefully without orphaning any of the other related pieces. Furthermore, after results for biology or chemistry are added to a station, the station cannot be deleted without orphaning the results. These many complex linkages of data enable valuable flexibility and versatility in utilizing the data, but they also constitute a wealth of supporting evidence for one primary rule regarding station creation:

THOU SHALT NOT CREATE DUPLICATE STATIONS!

No one in DSW can delete a duplicate station. Only a DBA in ITS can delete a station, and then only *if* no results are attached to it, *and* an official request is made to follow a very specific procedure (which, it so happens, is not even developed yet)... So, here are some tips for ways to search for existing stations for each of your sampling locations BEFORE you attempt to create a new station.

Using the Search capabilities of EA3

Site Search

Home Sites Projects Fish Bugs Assessment

My Applications: EA3, Motor Pool, My Settings, TAS, TREES

Other Links: Ohio EPA, 1A@W, Log Out

Ohio EPA
Powered by ITS Programming

Search for Stations Within Organization "Division of Surface water"

ID

Name

Type

Basin

Stream Code Tributary Code

River Mile Range:
Minimum Maximum

HUC-8 HUC-11/14

County

Drainage Area

Hydrologic River Mile

Click **Help** for instructions on defining search criteria.

The above screen shows the various fields provided on EA3's station Search tab. You can specify criteria to narrow your search for stations in EA3 by using any of these fields, singly or in combination. As the yellow box suggests, you can click HELP to get more information about defining your search criteria. Keep in mind that you can make your search as specific or general as you desire – it may take a little practice to become efficient.

For example, at one extreme you could hit the Submit button at the bottom without entering any criteria at all and the query will return a list of ALL existing stations.

The screenshot shows the 'Sites' web application interface. At the top right, the word 'Sites' is displayed in a green box. Below this is a navigation menu with tabs for 'Home', 'Sites', 'Projects', 'Fish', 'Bugs', and 'Assessment'. The 'Sites' tab is currently selected. Below the navigation menu, there are links for 'List', 'Search', 'New', and 'Help'. The main heading is 'Stations Matching Current Search Criteria'. Below this heading, there are navigation controls: 'Page 1 of 126' on the left, 'Stations 1-20 of 2506' in the center, and a set of four arrows (left, left, right, right) on the right. Below the navigation controls is a table with the following columns: 'ID', 'Name', 'Stream Code', 'River Mile', 'Drainage Area', and a small icon. The table contains four rows of data:

<u>ID</u>	<u>Name</u>	<u>Stream Code</u> ▼	<u>River Mile</u>	<u>Drainage Area</u>	
J02S15	HOCKING R @ STIMSON AVE AT ATHENS	01-001-000	33.03	942.0	
601530	HOCKING R @ CR 31 NR ENTERPRISE	01-001-000	73.37	459.0	
601550	HOCKING R @ RR ADJ WILSONS LN, 1ST RT 33 BRIDGE DST LANCSTR.	01-001-000	87.35	66.0	
600770	SCIOTO R DST CHILLICOTHE @ HIGBY BRIDGE	02-001-000	56.17	5131.0	

The above screen shot is from the Test database, which contains only 2506 stations. There are many more stations in EA3-Production now. But this gives you an idea of the most general search possible. You can use the left and right arrows just above and to the right of the results to page through the results when they won't fit on one screen, such as in this case when they would fill 126 screens.

Note that you can change the sorting of the search results by clicking on any of the column headings that are bolded and underlined like a hyperlink – ID, Name, or Stream Code. The downward arrow in the Stream Code column header indicates that the stations are currently sorted by Stream Code. (Sorting by Stream Code triggers an automatic secondary sort by ascending River Mile.) If you want to view or edit a station, click on its bolded and underlined ID in the left column:

Stations Matching Current Search Criteria

Page 1 of 126 Stations 1-20 of 2506

ID	Name	Stream Code ▼	River Mile	Drainage Area
J02S15	HOCKING R @ STIMSON AVE AT ATHENS	01-001-000	33.03	942.0
601530	HOCKING R @ CR 31 NR ENTERPRISE	01-001-000	73.37	459.0
601550	HOCKING R @ RR ADJ WILSONS LN, 1ST RT 33 BRIDGE DST LANCTR.	01-001-000	87.35	66.0
600770	SCIOTO R DST CHILLICOTHE @ HIGBY BRIDGE	02-001-000	56.17	5131.0

Other Links
Ohio EPA
1A@V
Log Out
OhioEPA
Powered by ITS Programming

Search for Stations Within Organization "Division of Surface water"

ID	<input type="text"/>	Click Help for instructions on defining search criteria.
Name	<input type="text"/>	
Type	<Any> <input type="button" value="v"/>	
Basin	19 - Cuyahoga River <input type="button" value="v"/>	
Stream Code	<input type="text" value="001"/>	Tributary Code <input type="text" value="000"/>
River Mile Range:		
Minimum	<input type="text"/>	Maximum <input type="text" value="1.0"/>

You can use any combination of fields on the search screen to narrow or widen your search – just be careful you don't enter conflicting information. It is particularly easy to ask for conflicting searches when changing from one search to the next – be sure to delete previous search criteria. For example, a search for "Maumee *" in the name field while you still have "19" selected in the basin field will yield no results – be sure to change the "19" back to "<Any>" in the Basin drop-down list first.

Search for a station in an Access station lists

The EA3 Search function can be a quick way to find an existing station, especially if you know the river code and river mile or other easily identifiable criteria. But it is much more thorough to go further if you fail to find a station in EA3, especially on an unnamed tributary or a lesser known stream. A more thorough search would be to use one of the EA3 station lists sent out periodically. These are currently arranged in 2 different orders, and other sorting options would be easy to provide. They are read-only Access tables, such as this:

stn list by basin_stream code and rm : Table						
BAS	STR	TRIBU	RIVER_MILE	IDENTIFICATION	SEQU	NAME
02	500	000	85.2	200434	0	PAINT CREEK UPST. ST. RT. 734
02	500	000	88.5	V10W19	1	PAINT CK @ HIDY RD NE OF JEFFERSON
02	500	000	88.57	V10W19	0	PAINT CK @ HIDY RD NE OF JEFFERSON
02	500	000	88.6	V10W19	2	PAINT CK @ HIDY RD NE OF JEFFERSON
02	500	000	96	V10W18	1	PAINT CK @ SR 323 N OF JEFFERSONVILLE
02	500	000	96.03	V10W18	0	PAINT CK @ SR 323 N OF JEFFERSONVILLE
02	500	001	1.3	V10K11	0	TAYLOR RUN @ POTTS HILL RD
02	500	002	0.1	V10K28	0	TRIB TO PAINT CK (31.26) @ NR BAINBRIDGE
02	500	003	3.07	V10K45	0	PLUM RUN @ BEAVER RD
02	500	005	2.6	300136	0	PONE CREEK S OF WASHINGTON C.H., UPST. ST. RT. 41
02	510	000	2.28	300047	0	N FK PAINT CK @ POKE HOLLOW RD
02	510	000	3.8	V10K01	1	N FK PAINT CK @ US RT 50
02	510	000	3.9	V10K01	0	N FK PAINT CK @ US RT 50
02	510	000	4	V10K30	0	PLEASANT VALLEY REG SEWER DISTRICT OUTFALL TO N FK PAINT CK
02	510	000	10.5	V10S18	0	N FK PAINT CK @ MUSSELMAN HILL RD DST FRANKFORT
02	510	000	14.1	V10K23	0	N FK PAINT CK DST FRANKFORT WWTP
02	510	000	14.26	V10S19	0	FRANKFORT WWTP OUTFALL TO N FK PAINT CK
02	510	000	14.34	V10S20	0	N FK PAINT CK @ WESTFALL RD UPST FRANKFORT
02	510	000	17.5	V10S01	0	N FK PAINT CK @ DEXTER RD
02	510	000	17.6	V10S01	1	N FK PAINT CK @ DEXTER RD
02	510	000	20.06	V10S44	0	N FK PAINT CK ADJ PLANO RD NW OF FRANKFORT

This shows a portion of the list that is ordered by River Code and River Mile. Note the Sequence # column – this shows a mixture of single digits, mostly zeroes. The records with a zero in the Sequence # column represent the Point of Record. This is the “main” location for the station, but all locations linked to a particular Station ID are considered part of the station and can be used for sampling. (Note that at this time CyberIntern will show the RM for the Point of Record only, though choosing a station ID and its specific location is a possible improvement slated for the future.)

In looking at the locations represented above for station ID V10W19, you’ll see sampling has occurred in the past at RM 88.50, 88.57, and 88.60. If you want to sample at or between any of these points, V10W19 is the station to use. In fact, if you want to sample just upstream of 88.60 or just downstream of 88.50, and you believe no other impacts occur to the stream between your location and V10W19’s RM range, you could use V10W19. You would simply add an additional sampling point to represent your location. (See “Editing a station – Adding Sampling Locations.”) In rural areas, the river mile range representing a station can often be much larger than in urban areas. Usually it’s a judgment call based on factors such as other tributaries nearby which could alter the stream quality and/or significantly affect the Drainage Area, or any discharges (point or non-point) that could alter the water quality.

However, if you want to sample Paint Creek at RM 92 or 93, according to this list you are out of luck – you’ll have to create a new station.

One other list you can use is ordered by the “Hydrological River Mile.” Since this river mile lists all the confluences of the streams below a certain point in the stream network, you can see where tributaries are “nested” along a mainstem. Though this has been used in the past mostly by the Modelers, it has the advantage of showing if any tributaries are present in a certain reach. This can be particularly helpful if you don’t know the name or river code of a smaller trib, or if it’s unnamed. For example:

1158.63 050.59 002.00	200621	0	ROCK CREEK DST. LAKE ROAMING ROCK @ RR
1158.63 050.59 002.72	G01W04	0	ROAMING SHORES WWTP OUTFALL TO ROCK CK ON SPILLWAY DST DA
1158.63 050.59 002.73	G01W03	0	LAKE ROAMING ROCK DST DAM ON SPILLWAY TO ROCK CK, UPST WW
1158.63 050.59 009.61 005.16	G01P04	0	LEBANON CK DST NEW LYME LANDFILL
1158.63 050.59 009.61 006.12	G01P03	0	LEBANON CK @ HUNTER RD AT NEW LYME LANDFILL
1158.63 050.59 009.68	G01W02	0	ROCK CK @ DODGEVILLE RD UPST RESERVOIR
1158.63 050.59 012.86 000.15 002.60	G01P02	0	TRIB TO ROCK CK TRIB (12.86/0.15) @ WINDSOR RD ENE OF ORWELL
1158.63 050.59 012.86 000.15 003.11	G01P01	0	TRIB TO ROCK CK TRIB (12.86/0.15) ENE ORWELL

The last 2 stations listed above are on a trib to a trib to Rock Ck. If you don’t know its River Code but you know it’s upstream of Lebanon Ck, this list can help you see if any tribs are represented in that reach.

In conclusion, there are many ways to search for stations, each with its own pros and cons. It’s important to take all precautions possible to be sure a station doesn’t already exist before you create one. In fact, consider it a time-savings to find an existing station – you’ve saved yourself the time and effort of creating a new one. If all fails, however, and you find you have indeed created a duplicate station by mistake, let me know ASAP so, if possible, we can mark it “inactive” before it gets used for any results. Then we have the best chance of being able to delete it.

REQUIRED FIELDS TO CREATE A NEW STATION

Gather this information (especially lat/long) for each sampling point before you log in – EA3 has a “time-out” period so if you leave the application unused for too long you will have to log in again and will lose the station you had started. I think the time-out is approximately 15-30 minutes.

- 1) **Station Name** – 60 characters free text, usually stream name and road crossing, or facility name and receiving stream.
- 2) **Station Type** – drop-down list.
- 3) **Stream Code** – composed of the old “River Code” (basin + stream code), plus a relatively new 3-digit Tributary code. You should fill in the **Basin Code** from the drop-down list. You should fill in the Stream and Trib codes **ONLY** if Dennis has provided them on a recent study plan, or if you know them very certainly from another station in EA3. Otherwise please leave them blank for Dennis or me to populate later. These codes frequently get changed or rearranged during the station upload and merger process, so do NOT rely on any historical listings.
- 4) **Ecoregion** – drop-down list.
- 5) **Latitude** and **Longitude**, including metadata such as the **Datum**, determination **Method**, and **Scale**.
- 6) **HUC code** – at least HUC-8, preferably also HUC-12 or HUC-14.
- 7) **River Mile**.
- 8) **County** (including both county names if station is on a county line).

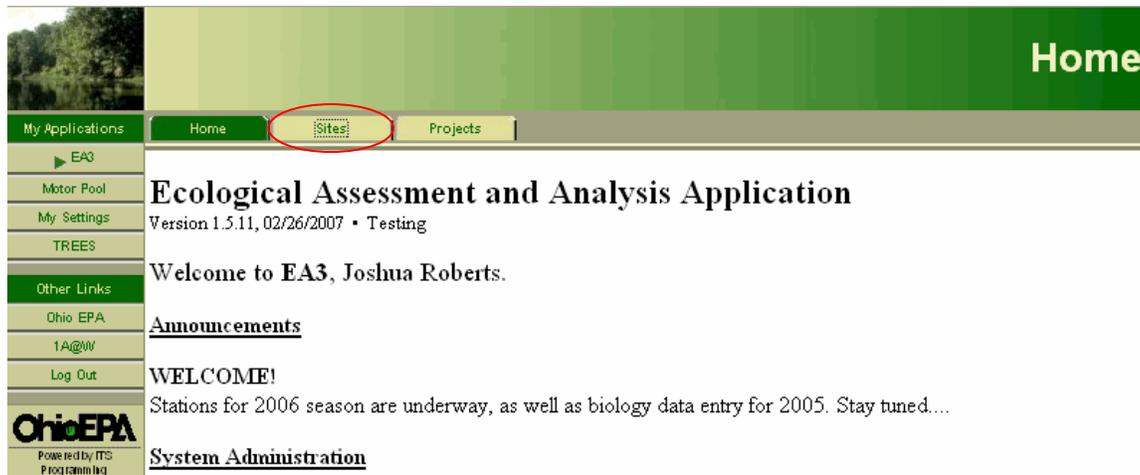
CREATING A NEW STATION, BRIEF OUTLINE OF STEPS

- 1) Sign in, select Sites tab at top of screen.
- 2) Select New tab from top of screen.
- 3) Be sure screen is entitled “Creating Station” – for a while during development and even after deployment, a pesky bug in the application caused it to misdirect itself occasionally. This would cause the station information to be added or edited incorrectly. If you ever see a malfunction of any sort in the application, notify ITS immediately with a description (as detailed as possible) of the malfunction, the time it occurred, and a screen capture to document the problem if possible.
- 4) Scroll to bottom of screen and click on “None” next to “Point of Record” to create the Point of Record first. The Point of Record must be created before any information can be added to the main station screen.
 - A. Be sure screen is entitled “Creating Point Of Record for New Station.”
 - B. Skip “Name” field.
 - C. Choose format you prefer for lat/long entry – “Degrees/Minutes/Seconds” or “Decimal Degrees.”
 - D. Enter lat and long. If using Decimal Degrees, enter at least 4 decimal places.
 - E. Choose HUC-8 from drop-down list. Also choose HUC-11/HUC-14 if possible.
 - F. Enter River Mile.
 - G. Enter Drainage Area if supplied on plan of study – otherwise, leave blank.
 - H. Leave Hydrologic River Mile blank.
 - I. Choose Primary County from drop-down list. Choose Secondary County if station is on the county line (for example, if sample is from the bridge on “County Line Road”).
 - J. Choose Geopositioning – Datum from drop-down list. Usually this will be either NAD83 or WGS84 for new coordinates. All historical lat/longs from paper topos are NAD27.
 - K. Choose Geopositioning – Method from drop-down list.
 - i) “GPS Code (Pseudo Range) Differential” for WAAS-enabled GPS units.
 - ii) “GPS Code (Pseudo Range) Standard Position (SA Off)” for GPS units without WAAS or with WAAS not functioning.
 - iii) “GPS – Unspecified” if you do not know if the unit was WAAS-enabled.
 - iv) “Interpolation – Map” for any mapping software.
 - L. Enter Scale for any lat/longs whose method is “Interpolation – Map.” Leave Scale blank for GPS methods.
 - M. Click on Submit button to create the Point of Reference.
- 5) Now you can fill in the main station screen.
 - A. Be sure screen is entitled “Creating Station.”
 - B. Enter station name, 60 characters free text (avoid slashes, double quotes, and pipe characters “|”). Examples: “Dry Run @ Green River Rd”, or “Whoville WWTP outfall to Crumpit River.”
 - C. Choose Station Type from drop-down list.
 - D. Choose Basin Code from drop-down list.
 - E. Enter Stream and Trib codes (3 numeric characters each) if you know them certainly; otherwise leave them blank.
 - F. Choose Ecoregion from drop-down list.
 - G. If the site is within a mixing zone, select Within ZID. Otherwise leave the default “Does not apply.”
 - H. Choose any stream Use Designations of which you are certain from their drop-down lists; otherwise do not change defaults.
 - I. Do not use Attachment section – it currently does not work.

- J. Click on Submit button to create the new station.
- 6) New station ID is assigned and displayed – it will be a 6-digit numeric string beginning with a “3”.
- 7) If you need to Edit a station or add more Sampling Locations, click on the Edit tab at the top.
 - A. To Edit a station, simply navigate to and edit fields desired. REMEMBER, however, just as when you create a new station, you should first make changes to the Point of Record or Other Sampling Points detail screens and click Submit before editing the fields on the main station screen. Then click Submit at the bottom of the main station page to finalize the Edit.
 - B. To add another Sampling Location to a station, scroll to the bottom of the screen and click on [New Sampling Point](#).
 - i) Be sure screen is entitled “Creating Sampling Point for 3XXXXX.”
 - ii) Enter lat/long, River Mile, Drainage Area if known, and lat/long metadata (Datum, Method, and Scale) as per instruction 4 in adding the Point of Record above.
 - iii) Click on Submit button on sampling point screen to create new sampling point.
 - iv) Click on Submit button on main station screen to complete the station edit.

CREATING A NEW STATION – ALL THE GORY DETAILS

1. Sign in as usual to EA3 and select the “Sites” tab.



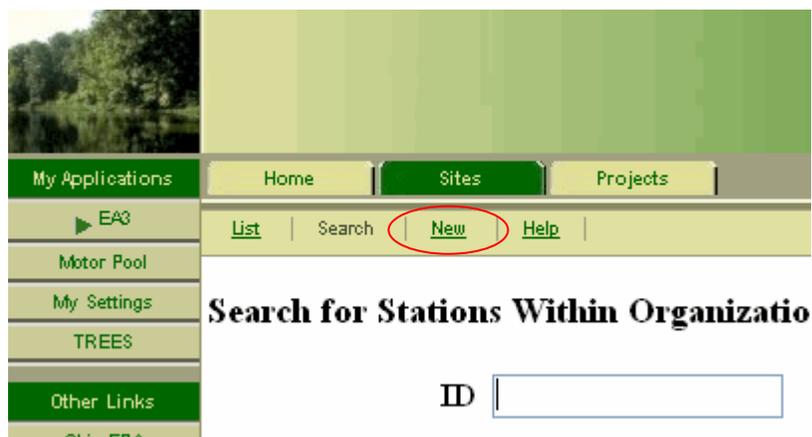
Click [here](#) to use system administrator functions.

Navigation

- Click one of the menu buttons above to use a particular function of EA3.
- Click on an application name on the left to use a different application.
- Click the **Back** button to return to the page from which you came.

This application is restricted to authorized users.

2. Select 'New' from the navigation choices at the top of the screen.



3. Check screen header: "Creating Station" should appear at the top of the screen. This is the "main" station screen.

The screenshot shows a web application interface for creating a station. At the top, there is a navigation bar with 'Home', 'Sites', and 'Projects' tabs. Below this is a secondary navigation bar with 'List', 'Search', 'New', and 'Help' links. The main content area is titled 'Creating Station', which is circled in red. The form contains the following fields: 'Name' (text input), 'Type' (dropdown menu set to 'River/Stream'), 'Established' (date picker set to 'Mar 5, 2007'), 'Status' (dropdown menu set to 'Active'), and 'Description' (text area). The Ohio EPA logo is located in the bottom left corner.

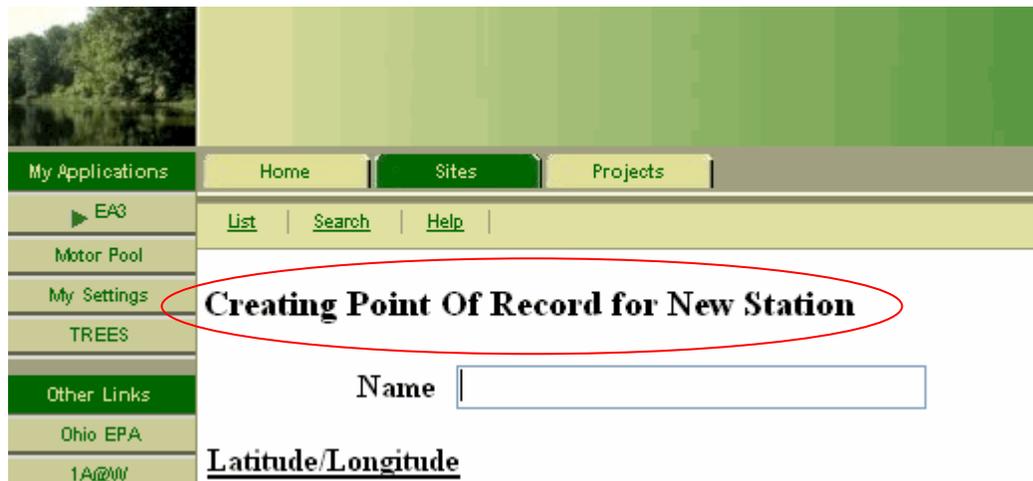
Creating Point of Record

IMPORTANT NOTE: You must create the Point of Record for a new station before filling in any other fields. No information you add on the first screen will be saved if the Point of Record does not already exist. You'll probably have to learn this the hard way (like I did), but don't say I didn't warn you...

4. To create the Point of Record, click the blue 'None' hyperlink at the bottom of the main station screen.

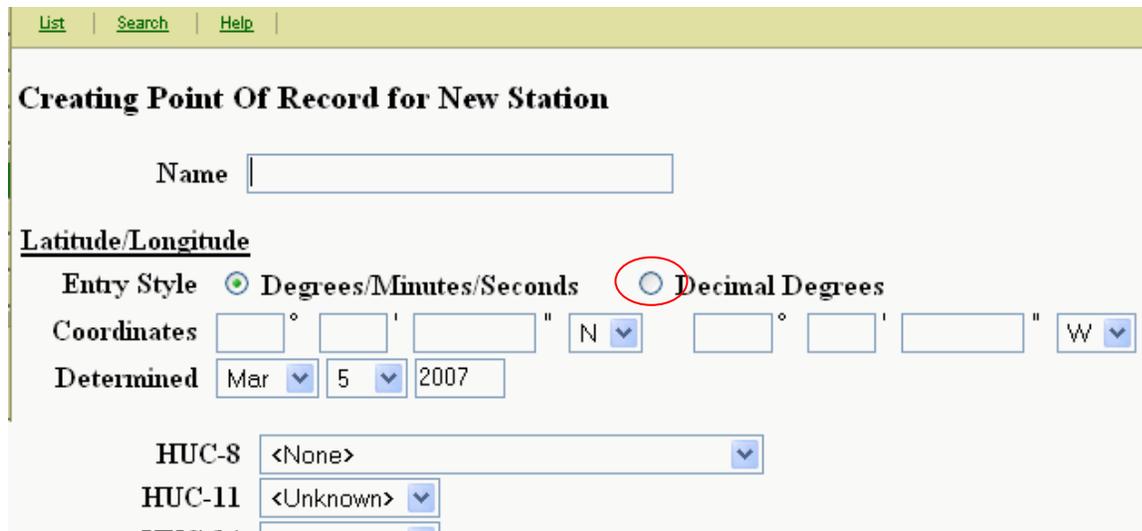
The screenshot shows an 'Attachment' form. It includes a 'Currently' field with the value '<none>'. Below this are fields for 'File' (with a 'Browse...' button), 'Title', and 'Type' (dropdown menu set to '<Unknown>'). At the bottom, there is a 'Point of Record' field containing the blue hyperlink 'None', which is circled in red. Below the form are three buttons: 'Submit', 'Reset', and 'Cancel'.

4A. Check screen header again, it should now read “Creating Point of Record for New Station” at the top of the screen.



4B. Points of Record do not have a name, so skip to the Latitude/Longitude field.

4C. Select the format in which you prefer to enter lat/long by clicking on either Degrees/Minutes/Seconds or Decimal Degrees. The entry boxes for the Coordinates will change to match the format you choose.



4D. Enter the latitude and longitude, using at least 4 decimal places if entering Decimal Degrees. You do not need to enter the negative sign before the longitude.

Creating Point Of Record for New Station

Name

Latitude/Longitude

Entry Style **Degrees/Minutes/Seconds** **Decimal Degrees**

Coordinate

Determined

Subsequent detail screens will default to lat/long format of the previous entry.

4E. Blue downward arrows at the right end of a field indicate that a drop-down menu of choices is provided for that field.

HUC-8

HUC-11

HUC-14

Select the HUC-8 for your station from the drop-down list.

HUC-8

HUC-11

HUC-14

You'll notice the screen "blinks" (refreshes) briefly about a second after you choose HUC-8. This happens because the application populates the HUC-11 drop-down list based on the specific HUC-8 you chose. There is no drop-down list for HUC-11 until a HUC-8 is chosen, and likewise no list for HUC-14 until a HUC-11 is chosen. The HUC codes must be chosen sequentially – HUC-8, then HUC-11, finally HUC-14.

4J-K-L.

J. Choose the correct “Geopositioning – Datum” from drop-down list. For recent calculations this will usually be either NAD83 or WGS84. NAD27 is the default for all historical stations whose lat/long have not been rechecked since the original determination 5 or more years ago from paper USGS topos.

K. Choose the correct “Geopositioning – Method” from drop-down list. Our most common choices are:

- i) “GPS Code (Pseudo Range) Differential” for WAAS-enabled GPS units.
- ii) “GPS Code (Pseudo Range) Standard Position (SA Off)” for GPS units without WAAS or with WAAS not functioning.
- iii) “GPS – Unspecified” if you do not know if unit was WAAS-enabled.
- iv) “Interpolation – Map” for any mapping software on a PC or the Internet.

L. Enter Scale for any lat/longs determined by “Interpolation – Map.” Leave Scale blank for GPS methods.

The image shows a web form titled "Geopositioning". It contains three input fields: "Datum" with a dropdown menu showing "North American Datum 1927", "Method" with a dropdown menu showing "Interpolation-Map", and "Scale" with a text input field containing "1:24000". Below these fields are three buttons: "Submit", "Reset", and "Cancel". Red circles are drawn around the "Datum" and "Method" labels, the "Submit" button, and the "Scale" input field.

4M. Click on the Submit button at the bottom of the screen to complete the Point of Record and return to the main station screen.

Filling in main station screen

5. NOW! Finally you can populate the first screen.

5A. Recheck the screen header; it should say "Creating Station."

The screenshot shows a web interface for creating a station. The page title is "Creating Station", which is circled in red. The navigation menu includes "Home", "Sites", and "Projects". The "Sites" menu is expanded, showing "List", "Search", "New", and "Help". The "New" option is selected. The form fields are: "Name" (circled in red), "Type" (set to "River/Stream"), "Established" (set to "Mar 8, 2007"), and "Description". The Ohio EPA logo is in the bottom left corner.

5B. Enter the station name. This field will hold up to 60 characters of text. To simplify searches and retrievals in the future, avoid using double-quotes or pipe characters "|." We usually structure this field by listing the stream name first followed by the sampling location or landmark for river/stream sites. We list the facility name followed by receiving stream for effluent samples. Some examples:

Ambient station examples:

FOURMILE CK @ LANES MILL RD DST OXFORD WWTP
SALT LICK CK @ SECOND US RT 35 BRIDGE DST JACKSON
MILL CK @ MILL CK RD (AKA CALPIN RD)
SWAN CK @ US RT 25 (DETROIT AVE) AT TOLEDO
TRIB TO JAMISON CK (0.09) @ SR 42, 1 MI E OF ASHLAND

Effluent station examples:

JEFFERSON WOODS WWTP EFFLUENT TO SYCAMORE CK

CSC INDUSTRIES INC 002 OUTFALL TO MAHONING R

PEACEFUL ACRES MHP WWTP 001 OUTFALL TO BLUE CK VIA SEWER

STORM SEWER TO PAW PAW CK W OF NAT'L FRUIT/VEG IN BALTIMORE

5C. Choose Station Type from drop-down list. Our most commonly used Types are:

River/Stream

Facility – Industrial

Facility – Municipal Sewage (POTW)

We have used other types also, such as Channelized stream, Canal, Storm sewer and Waste sewer.

5D. Select the Basin code from the drop-down list.

5E. Enter the Stream and Tributary codes if Dennis has assigned them, or you know them certainly from EA3 from another station on the same stream. Otherwise, leave them blank for Dennis to fill in later. Do not use historical sources for Stream or Trib codes – these can change during the basin merge-and-upload process.

Stream Code

Basin	09 - Southeast Ohio River Tributaries	Stream	000	Tributary	000
Ecoregion	Eastern Corn Belt Plains				
ZID Relation	Does not apply	Water Depth		Feet	

5F. Select Ecoregion from the drop down list.

5G. ZID Relation - If the site is in a mixing zone, select “Within ZID” from the drop-down. In these cases, also be sure “mix zone” is stated in the station name so it will be clear to everyone who uses the data. If the station is not in a mixing zone, do not change the default entry for ZID Relation – “Does not apply.”

Note – we are generally not using Water Depth for stream stations. It may come in handy for Lake stations.... or maybe not. We are also able to store water depth at the sample level instead of station level, and that may allow us more flexibility. Look for further discussion about this in the future.

5H. Choose any stream Use Designations of which you are certain from their drop-down lists. Otherwise, do not change the defaults.

Aquatic Life Use	<input type="text" value="Warmwater Habitat"/>	<input type="button" value="v"/>		
Antidegradation Use	<input type="text" value="General High-Quality Water"/>	<input type="button" value="v"/>		
Recreational Use	<input type="text" value="None"/>	<input type="button" value="v"/>		
Agricultural Use	<input type="text" value="Unknown"/>	<input type="button" value="v"/>	Industrial Use	<input type="text" value="Unknown"/>
Public Water Supply	<input type="text" value="Unknown"/>	<input type="button" value="v"/>	Cold Water	<input type="text" value="No"/>
State Resource Water	<input type="text" value="Unknown"/>	<input type="button" value="v"/>	Seasonal Salmonid	<input type="text" value="Unknown"/>

5I. Do not use the attachment section – it does not work yet.

Attachment
 Currently <none>

File

Title

Type

5J. If you are finished with this station, click on the Submit button at the bottom of the main page to complete the new station.

Attachment
 Currently <none>

File

Title

Type

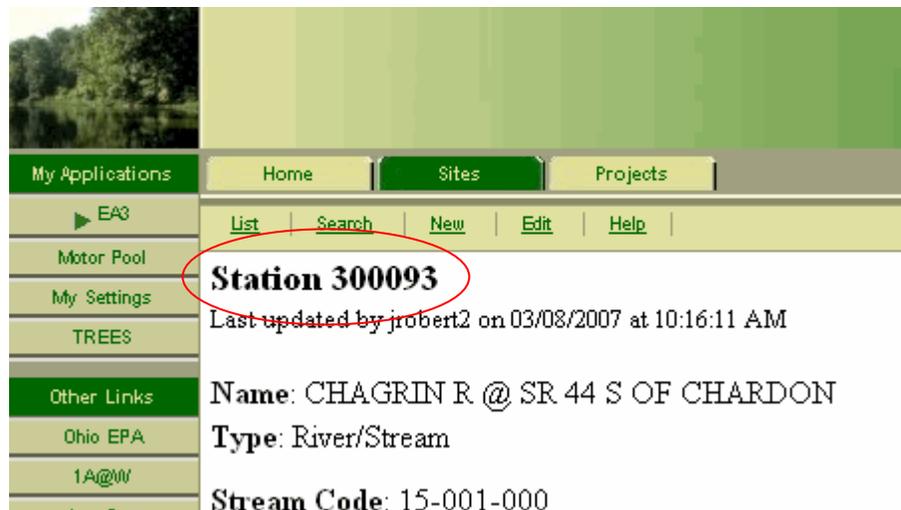
Point of Record:

Name	Lat/Long	HUC	River Mile	County
<none>	39° 27' 16.92" N, 84° 5' 53.16" W	05090202	47.5	Warren

Other Sampling Points: None. [New Sampling Point](#)

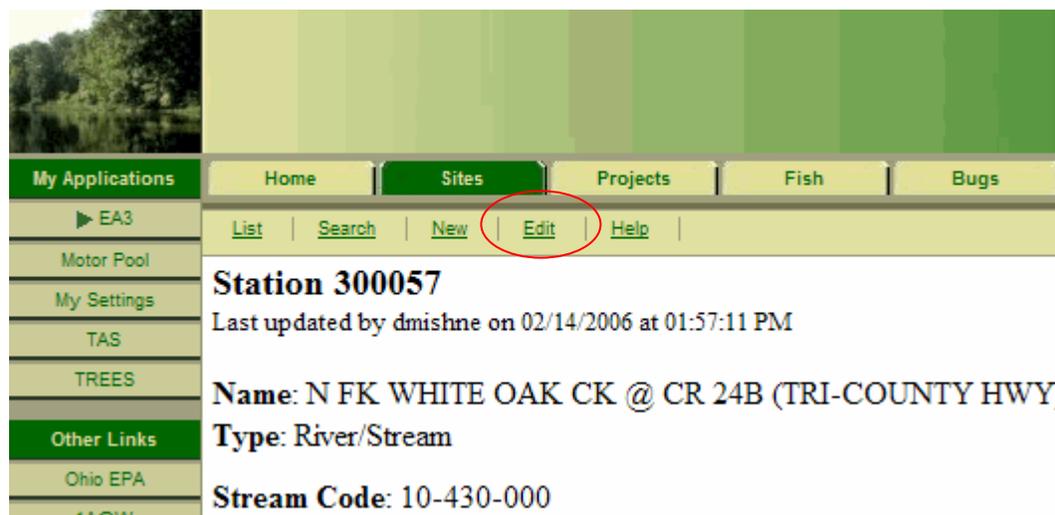
New station ID

6. The station will now have an auto-assigned ID which will be displayed on the final station screen. The ID will be a 6-digit numeric string beginning with a “3.”



Editing a station

7. If you need to edit a station or add additional Sampling Points, select the “Edit” tab at the top of the screen.



Editing fields

7A. To Edit a station, simply navigate to and edit fields as desired. BUT REMEMBER – the same rule applies to station edits as when a new station is created: you should make changes to the Point of Record or Other Sampling Points detail screens first. Click Submit to complete the detail screen edit before editing fields on the main station screen. Then click Submit at the bottom of the main station screen (even if you made changes to detail screens only and none to the main station screen) to finalize the station Edit.

Adding Sampling Locations

7B. To add another Sampling Location to a station, select the Edit tab, and then scroll to the bottom of the main screen and click on [New Sampling Point](#).

Attachment

Currently <none>

File

Title

Type

Point of Record:

Name	Lat/Long	HUC	River Mile	County
<none>	39° 27' 16.92" N, 84° 5' 53.16" W	05090202	47.5	Warren

Other Sampling Points: None. [New Sampling Point](#)

Be sure the next screen is entitled "Creating Sampling Point for 3XXXXX." Enter lat/long, River Mile, Drainage Area if known, and lat/long metadata (Datum, Method, and Scale) as per instruction 4 above (adding the Point of Record). Click the Submit button at the bottom of the sampling point screen to create the new sampling point. And then don't forget to click the Submit button at the bottom of the main station screen to complete the station edit.