Surface Water Field Sampling Manual - Appendix IV

Data Management

Photo Courtesy of Russ Gibson, Ohio EPA, DSW

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Surface Water Field Sampling Manual

Appendix IV

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APPENDIX IV – SECTION A. DATA MANAGEMENT

Subsection A1. Data Validation Guidelines for QC and Field Samples

For most DSW chemical water quality data, data validation is generally confined to evaluation of Blank results, Duplicate results, sample holding times, paired parameter results (defined below) and confirming that samples were properly preserved/prepared (including filtration, etc. - if indicated by the method). Standards for evaluation of analytical results of those QC sample types and general field samples are described below.

Data can be qualified using the standard qualifiers available as defined by DES (in their field handbook) such as “J” for an estimated concentration or “R” for rejected result as well as one additional qualifier, “Trend.” Some results may be too uncertain for some data uses but potentially useful for more general data trend applications.

Data qualifiers should be added by samplers to EA3 as part of their data review process. This will ensure the qualifier remains with the sample result. We want to be sure that valid conclusions can be made using our data for any current and future data uses.

Data Qualifiers
All sample results have some amount of uncertainty surrounding the quantification of analyte in a given sample. Data qualifiers are used to indicate that extra uncertainty is present surrounding a given result (e.g., “J” for estimated or “Trend” to indicate more uncertainty). The data qualifier “R”, Rejected, is used to indicate that too much uncertainty is present to consider the result quantitatively (for most data applications). “Trend” is a qualifier used by DSW to indicate when data is considered to have less quantitative significance but enough for assessing data trends.

Blanks – Blank contamination can result in qualification of other results that were in the same field batch as that blank. In some cases, these other results may still be useable and other times the sample results should not be considered valid, largely depending on the concentration in the sample vs. the concentration in the blank.

Laboratories often use a factor of three to differentiate a detected compound from background “noise” present in the system (analytical instrument, etc.). When a result exceeds three times the background noise, it is considered to be positively identified in the sample. We can consider blank contamination as extra “noise” in the system, since we don’t know the source of the contamination, and use this factor of three to help us assess our data. To do so, the sample concentration must be at least three times the blank concentration for us to be confident that analyte is truly present in the sample.
Sample Result | Interpretation
--- | ---
Blank > Sample | The result is “J” for system uncertainty
Sample ≤ 3x Blank | Reject sample results in this range as insufficiently different from blank results
3x Blank < Sample ≤ 5x Blank | Likely indication that the analyte is present but poor confidence in the numerical result - generally limit data use to data “trend” applications
< 5x Blank < Sample ≤ 10x Blank | Consider the sample result to be an estimated concentration (qualified “J”) but still suitable for most data uses
> 10x Blank | Do not qualify data (blank contamination does not significantly change the result within the uncertainty of the value reported)

Blank qualification examples:

<table>
<thead>
<tr>
<th>Blank Result</th>
<th>Detect. Level</th>
<th>Sample Result</th>
<th>Qualifier</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5</td>
<td>7</td>
<td>“R”</td>
<td>Result ≤ 3x Blank</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>16</td>
<td>“R”</td>
<td>Result ≤ 3x Blank</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>29</td>
<td>“Trend”</td>
<td>&lt; 3x Result ≤ 5x Blank</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>79</td>
<td>“J”</td>
<td>&lt; 5x Result ≤10x Blank</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>81</td>
<td>No qualifier</td>
<td>Result &gt; 10x Blank</td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>Non-detect</td>
<td>“J”</td>
<td>System uncertainty</td>
</tr>
</tbody>
</table>

Note: If Data Quality Objectives for a parameter are well above (>5x) blank contamination and field sample results use of only a “J” qualifier, instead of "Trend" or "R", may be warranted.

Field Duplicates – Laboratories analyze and evaluate duplicates for their own internal procedures but DSW staff collect field duplicates to evaluate variability regarding sampling precision for field QC. Duplicates must be submitted “blind” to the laboratory in order to properly assess precision. The duplicate sample results are compared using a statistic called Relative Percent Difference (RPD).

RPD - Relative Percent Difference: \[ % \text{Diff.} = \left| \frac{x_2 - x_1}{\frac{(x_1 + x_2)}{2}} \right| \times 100 \]

In the %RPD example below one sample result/ concentration is substituted in the equation for \( x_1 \) (6) and the other for \( x_2 \) (10 - it doesn’t matter which is which in this equation - but traditionally the duplicate will be \( x_2 \)).

Example RPD calculation:

\[ \frac{|(6-10)|}{|((6+10)/2)|} \times 100 = \frac{|-4|}{|8|} \times 100 = 0.5 \times 100, \text{ (positive since it’s an absolute value) } \]

RPD = 50%
We allow a higher %RPD at lower concentrations, since there is a greater percent uncertainty closer to the detection level, and allow a lower %RPD at higher concentrations, since analytical results should be more consistent at higher concentrations. To account for this varying acceptable %RPD, we assess our duplicate samples using a curved line.

By starting with three points based on the ratio of the sample concentration to the detection limit and the %RPD we are willing to accept, we can use Excel to generate the equation of a line. The three points used were:

1. (1, 1.0) – At the minimum detection limit, we are willing to accept approximately 100% RPD
2. (5, 0.5) – at 5x the detection limit (often near the RL), we are willing to accept approximately 50% RPD
3. (100, 0.2) – at 100x the detection limit, we are willing to accept approximately 20% RPD

The graph (taken from Excel, using the “Power” option from the “Trendline” function) shown below illustrates the curve of best fit for these three points. The resulting R² value confirms a good fit of our line to our points.

![Graph of acceptable RPD vs. sample/detection limit ratio]

Using “Trendline” in Excel we are able to generate an equation with a very good fit to these three points. With additional tweaking of the equation (adding 5% to each result,) we get a result that gives us almost exactly 100% RPD when the sample concentration equals the detection limit and puts us back up above 10% RPD for high concentration samples (see the table below).

The resulting final equation is:

\[ Y = [(0.9465x^{-0.344}) \times 100] + 5 \]
where \( x = \) Sample/DL ratio and \( y = \) acceptable %RPD

At first take, this approach might seem somewhat arbitrary, but we have to remember that all approaches have some arbitrary component and what we need is to be consistent and to define an approach that we are comfortable with. Using the above equation, we get acceptable %RPDs at the following levels:

**Determine Maximum Acceptable %RPD (based on sample concentration to DL ratio)**

<table>
<thead>
<tr>
<th>Sample* Conc./DL (x)</th>
<th>“Trendline” equation from Excel ( Y = (0.9465x^{0.344}) \times 100 )</th>
<th>( y' = [(0.9465x^{0.344}) \times 100] + 5 ) (add 5% to baseline eqn.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>94.65</td>
<td>99.65</td>
</tr>
<tr>
<td>2</td>
<td>74.57</td>
<td>79.57</td>
</tr>
<tr>
<td>5</td>
<td>54.41</td>
<td>59.41</td>
</tr>
<tr>
<td>10</td>
<td>42.87</td>
<td>47.87</td>
</tr>
<tr>
<td>50</td>
<td>24.64</td>
<td>29.64</td>
</tr>
<tr>
<td>100</td>
<td>20.41</td>
<td>24.41</td>
</tr>
<tr>
<td>200</td>
<td>15.30</td>
<td>20.30</td>
</tr>
<tr>
<td>1000</td>
<td>8.79</td>
<td>13.79</td>
</tr>
</tbody>
</table>

*Not the duplicate sample concentration. For sample results below the minimum detection limit (and the duplicate is above the MDL), use the MDL in the Duplicate Maximum %RPD calculations (otherwise there is insufficient latitude for variability at low concentrations).

This leaves us with a two-tiered system for duplicates. If our %RPD is below the values from our equation (i.e., below the curve), we accept both data points as valid. If the %RPD exceeds the %RPD from the equation, we don’t know which value to believe is correct, the sample or the duplicate value, so we must reject (“R” qualify) both data points. At that point, particularly if multiple duplicate pairs have been rejected, the sampler(s) should look into possible causes for the disagreement and work to minimize those causes for future sampling.

**Paired Parameters** – There are some parameter pairings that DES evaluates (using %RPD) in tandem, since they are related. We can make use of these assessments too. Some parameters are fractions or subsets of others, such as nitrate being part of nitrate/nitrite, so that the one parameter should, in theory, never have a higher concentration than the other parameter. Examples of paired parameters are below:

- **TOC \( \geq \) DOC**
- **Nitrate/Nitrite \( \geq \) Nitrate**
- **Total P \( \geq \) orthophosphate (or dissolved reactive phosphorus)**
- **Total Cr \( \geq \) Hexavalent Cr**
- **TKN \( \geq \) Ammonia**
- **BOD \( \geq \) Dissolved BOD (or other dissolved parameter pairings)**

It’s theoretically possible that the subset analyte could be 100% of the total (or larger) analyte, but any result where that compound exceeds the total (or larger compound) should be considered an estimated concentration (qualified...
with a “J”). Results that are quite close may be essentially the same number and valid for most data uses. Similar to how we evaluated duplicate samples above, we will use the same equation to determine the acceptable %RPD for “Paired Parameters” analytical results within the same sample.

For “Paired Parameters” with a %RPD less than the equation amount (using an average Detection Limit this time, since they may be different), we will simply acknowledge the difference with a “J” qualifier, leaving both data points as usable for most applications. However, when the %RPD exceeds the amount from the equation, we will generally not use the two data points and reject (qualify with an “R”) the results. In this situation we don’t know which result to believe and they are too different for us to be comfortable with the variability present. This all applies only when the subset parameter has a higher concentration than the expected larger/parent parameter. If the subset parameter has a lower concentration, then no evaluation/qualifiers are needed.

Example data for “Paired Parameters” assessed using the maximum %RPD equation:

\[ Y = [(0.9465x - 0.344) \times 100] + 5 \] (where x is the “parent” sample concentration/DL and Y is the max. %RPD).

<table>
<thead>
<tr>
<th>Subset parameter – example concentration</th>
<th>Parent (larger) parameter – example concentrations</th>
<th>Subset DL (DES webpage*)</th>
<th>Parent DL (DES webpage*)</th>
<th>Average DL</th>
<th>%RPD (Parent and Subset)</th>
<th>Max. Allowed %RPD (from the eqn.)</th>
<th>Data Qualifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cr \textsuperscript{6} – 3.6</td>
<td>Tot. Cr – 3.5</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>2.82</td>
<td>75.87</td>
<td>“J”</td>
</tr>
<tr>
<td>Cr \textsuperscript{6} – 7.5</td>
<td>Tot. Cr – 3.5</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>72.73</td>
<td>75.87</td>
<td>“J”</td>
</tr>
<tr>
<td>Cr \textsuperscript{6} – 7.8</td>
<td>Tot. Cr – 3.5</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>76.11</td>
<td>75.87</td>
<td>“R”</td>
</tr>
<tr>
<td>Cr \textsuperscript{6} – 24</td>
<td>Tot. Cr – 16</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>40.0</td>
<td>44.98</td>
<td>“J”</td>
</tr>
<tr>
<td>Cr \textsuperscript{6} – 26</td>
<td>Tot. Cr – 16</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>47.62</td>
<td>44.98</td>
<td>“R”</td>
</tr>
<tr>
<td>Cr \textsuperscript{6} – 16</td>
<td>Tot. Cr - 26</td>
<td>3.4 ug/L</td>
<td>0.28 ug/L</td>
<td>1.8 ug/L</td>
<td>47.62</td>
<td>38.06</td>
<td>None (par&gt;sub)</td>
</tr>
</tbody>
</table>

* Detections limits may change – make sure that you are using the MDL associated with your data from that day’s DES analysis. For results below the detection limit, the minimum detection limit in the Paired Parameter Maximum %RPD calculations.

**Sample Holding Time** – This is an important QC item that is easily checked on any data set. Generally, DES will note any holding time discrepancy but it’s still worth some discussion. With some parameters, like a total result for a metal, slightly exceeding the holding time may make little or no difference (and would likely result in only a “J” qualifier being added to the result in the reported concentration. But for other parameters missing the holding time would generally lead to complete rejection (“R”) of that data.
The amount of the holding time exceedance can be evaluated relative to the total holding time, shorter times lead to lower tolerance of exceedances (as a result of less stable analytes). It can also be situation dependent – in some cases a one-day exceedance for a 28 day holding time may be acceptable and other times, not so. Alternately a one-day exceedance for a metals sample would likely make no difference (but we’d likely “J” qualify it as an acknowledgement of the exceedance – and for most situations we will use “J” qualified data anyway).

**Subsection A2. Reserved for other Data Management Topics in the future.**
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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:

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:

![Detail Screen Example](image)

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:

![Sampling Point Screen](image)

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

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 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:
To reduce the search results to a smaller and more useful grouping, try adding other criteria. If you know the basin and stream code for your location, try adding them. For example, the Cuyahoga River mainstem is 19-001-000. If we select “19” from the Basin drop-down list on the search screen and enter “001” and “000” for the Stream and Tributary codes respectively, we will see the following results on the first page.
We can refine this further by adding a Minimum and/or Maximum River Mile Range on the search screen to get only the 4 stations listed above that are downstream of RM 1.0:

**Search for Stations Within Organization "Division of Surface water"

- **ID**
- **Name**
- **Type** <Any>
- **Basin** 19 - Cuyahoga River
- **Stream Code** 001
- **Tributary Code** 000
- **River Mile Range:**
  - **Minimum**
  - **Maximum** 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:
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 Sample Master® 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:

<table>
<thead>
<tr>
<th>Station</th>
<th>River Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1159.63 050.69 002.00</td>
<td>200421</td>
<td>0 ROCK CREEK DST. LAKE ROAMING ROCK @ RR</td>
</tr>
<tr>
<td>1159.63 050.69 002.72</td>
<td>001002</td>
<td>0 ROAMING SHORES WWTP OUTFALL TO ROCK Ck ON SPILLWAY DST DA</td>
</tr>
<tr>
<td>1159.63 050.69 002.73</td>
<td>001003</td>
<td>0 LAKE ROAMING ROCK DST DAM ON SPILLWAY TO ROCK Ck, UPST WW T</td>
</tr>
<tr>
<td>1159.63 050.69 008.61 006.16</td>
<td>001004</td>
<td>0 LEBANON Ck DST NEW LYM LANDFILL</td>
</tr>
<tr>
<td>1159.63 050.69 008.61 006.12</td>
<td>001005</td>
<td>0 LEBANON Ck @ HUNTER RD AT NEW LYM LANDFILL</td>
</tr>
<tr>
<td>1159.63 050.69 009.88</td>
<td>001006</td>
<td>0 ROCK Ck @ DODGSVILLE RD UPST RESERVOIR</td>
</tr>
<tr>
<td>1159.63 050.69 012.88 000.16 002.80</td>
<td>001007</td>
<td>0 TRIB TO ROCK Ck TRIB (12.8840.16) @ WINDSOR RD ENE OF ORWELL</td>
</tr>
<tr>
<td>1159.63 050.69 012.88 000.16 003.11</td>
<td>001008</td>
<td>0 TRIB TO ROCK Ck TRIB (12.8840.15) ENE ORWELL</td>
</tr>
</tbody>
</table>

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

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.

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.
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.

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.

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

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.
4F-G-H. Enter the River Mile. Enter the Drainage Area in square miles if provided by Dennis on a recent geometric site list – otherwise leave blank for Dennis to calculate later. Leave Hydrologic River Mile blank for Mary Ann to populate later.

4I Choose Primary County from the drop-down list. If station is on a county line (such as a sample from the bridge on County Line Rd), also choose a Secondary County from its drop-down. Note that Primary County displays the first county in the drop-down list (Adams) until you select a different county.

“In Great Lake” is used only for open-water Lake Erie (or other Great Lake) stations.
4J. 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.

4K. 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.
   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.

4L. Enter Scale for any lat/longs determined by “Interpolation – Map.” Leave Scale blank for GPS methods.

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.”

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
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.

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: Warmwater Habitat
Antidegradation Use: General High-Quality Water
Recreational Use: None
Agricultural Use: Unknown
Public Water Supply: Unknown
State Resource Water: Unknown
Industrial Use: Unknown
Cold Water: No
Seasonal Salmonid: Unknown

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

Attachment
Currently: <none>
File
Title
Type: <Unknown>

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.

Point of Record:
<table>
<thead>
<tr>
<th>Name</th>
<th>Lat/Long</th>
<th>HUC</th>
<th>River Mile</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;none&gt;</td>
<td>39° 27' 16.92&quot; N, 84° 5' 53.16&quot; W</td>
<td>05090202</td>
<td>47.5</td>
<td>Warren</td>
</tr>
</tbody>
</table>

Other Sampling Points: None. New Sampling Point
Submit  Reset  Cancel
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**.

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.
Subsection C1. Placeholder
APPENDIX IV – SECTION D. SAMPLE MASTER® INSTRUCTION MANUAL

Subsection D1. Log On

1. **Web address**: ohepa.atlab.com/vpn/index.html
2. **User Name**: first initial of first name + last name
3. **Password**: P@ssword123
4. **Click**: Log On

**First Visit**: On your first visit, click the + icon on the left side of the screen. Click on All Apps, then click on Sample Master®.
**Every visit:**

1. Click: Icon

2. **User Name:** first initial of first name + last name (lower case)

3. **Password:** first initial of first name + last name (upper case)

4. Click: Login

**Subsection D2. Create a Project Run**

1. Click: LIMS Maintenance

2. Click: Customers

3. Click: Select
1. Customer: Select DSW-XXXX from the list. (XXXX = district)

2. Click: Projects tab

1. Project ID: Double click in the white space.

2. Filter: Type in project code or other identifying information to filter site list.

3. Filter: Click the green filter button (or double press Enter on the keyboard)

4. Project ID: Select Project code for appropriate project.
1. **Project ID:** Rename Project ID as appropriate to identify your sampling project.

2. **Description:** (Optional) Add descriptive information as necessary.

   **Note:** Do NOT change the text in the column "Project Name"

3. **Project Sampling:** Select the Project Sampling tab.

4. **Station ID:** Double Click in the white space.

5. **Filter:** Type in STORET or other identifying information to filter site list.

6. **Filter:** Click the green filter button (or double press Enter on the keyboard).

7. **Station Code:** Select Station Code for appropriate sampling station.

   **Note:** Once a station has been used once, it should continue to appear in the Station ID drop-down list.
1. **Site Details**: Select the appropriate matrix, test/test group, method, and sample type for each site.

2. **Next Station**: repeat for each station, then selecting the site details. You may have to add a station twice if you need multiple individual parameters or test groups.

3. **Close**: Click close once all the sites are in the list.

**Note**: If you get stuck in an error loop, just press Esc on the keyboard. Then continue selecting the relevant items from the drop-down lists.

**Inland Lakes**: Enter the “Sample Type” for the bottom sample as “Composite” and the top sample as “Grab” at this step. The sample type will be corrected when the order is created. Otherwise, the system will not create tests for each parameter for both top and bottom.
Subsection D3. Create an Order

1. Click: Sample Tracking

2. Click: Sample Login

3. Click: Select

1. Click: New Order ID

2. Click: OK
1. Select: Select DSW-XXXX from the list. (XXXX = district)

2. Contact: Select your name.

3. Select: Select your project from the list.

4. Click: Samples>

1. Field Blank: (optional) Click Add Field Blank to add a Field Blank to the run. (Same for Equip Blank, Trip Blank, and MSD). Replicate and Duplicate should be added as sites using your district specific Blind Replicate and Blind Duplicate stations.

2. Tests: Choose a site then click Tests> to edit the samples for any given site.

Inland Lakes: Scroll right to find the “Sample Type” column. Change the bottom sample to “Grab” at this time. If you copy this order for later use, you will not need to do this step. If you produce an order from the project, you will need to correct the sample type again.

Note: Highlight a column and press “Ctrl-T” to copy the contents of the first cell down to the rest of the cells in the column.
Deleting/Canceling a Site

1. **Select sample:** Only the last sample can be removed deleted. All others can be canceled by using the Cancel Sample icon.

2. **Click icon:** Click to delete selected sample.

3. **Confirm:** Click yes to confirm.

Deleting/Canceling a Parameter

1. **Select sample:** Choose the sample you need to edit.

2. **Click Tests:** Click to expand list of tests for this site.
1. External bacteria documents: Click the drop-down arrow to create documents for bacteria samples submitted to external labs.

**Note:** On wider screens, the items in this drop-down may already be visible in the ribbon.

**Note:** For outside labs, the “test” must be “E Coli SUBCONTRACT”
Print/Export Forms & Labels

1. **Print Documents**: Click the drop-down arrow to create and print or publish Labels and Chain of Custody to PDF.

   **Note**: On wider screens, the items in this drop-down may already be visible in the ribbon.

2. **Print**: Click the icon to print, or open and print the PDF.

3. **Publish**: Click the icon to publish the Chain of Custody to PDF.
1. **Print Documents**: Click the drop-down arrow to create and publish Labels and Chain of Custody.

2. **Chain of Custody**: Click the icon to publish the Chain of Custody.

3. **Sample Labels**: Click the icon to publish the Sample Labels.

4. **Create Extra Sample Labels**: Click the icon to create extra labels.

5. **Field Template**: Click the icon to download the template for use when uploading field data (see pg 24). Note: add DSW_FIELD test group to your samples if you are using this table.

6. **Supp Field Template**: Click the icon to download the template for use when uploading supplemental field data (see pg 30). Note: add DSW_FLD_SUPP test group to your samples if you are using this table.

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**For Chain of Custody:**

1. **Chain of Custody**: Click the icon to publish the Chain of Custody.

2. **Date**: Choose if you want the date to print on the CoC or not. Click “Apply Format” to add the date, then “Close” to close the box.
3. Print: Click the icon to print, or open and print the PDF.

4. Publish: Click the icon to publish the Chain of Custody to PDF.

For Labels:

1. Sample Labels: Click the icon to publish the Labels.

2. Print: Click the icon to print, or open and print the PDF.

3. Publish: Click the icon to publish the Sample Labels to PDF.
For Extra Labels:

1. **Extra Labels:** Click the icon to Create Extra Sample Labels.

2. **Clear Table:** The table must be cleared before printing other runs, or the extra labels will continue to print for other orders.

3. **Site:** Choose the site(s).

4. **Count:** Specify quantity.

5. **Create:** Click to Create Labels. Repeat 5-7 to create labels for each site.

**Copying an Order**

1. **Select:** Select the old order you want to copy.

2. **Copy Order:** Choose “Copy Order to New OrderID” from the “More” menu.
Subsection D4. Uploading/Approving Field Data

1. Field Data Template: Open the field data template and paste your field data in the appropriate columns.

2. Click: Import Data from a File

3. Click: Select
1. Click: DSW Field Data

2. Click: Folder

3. File: Navigate to and select the field data file. Click OK.

4. Click: Import
1. Click: Yes

2. Click: Yes

3. Click: OK. Note the TASK name. It should appear in the next screen as the only option.

4. Task Name: Choose the Task Name from the drop down.

5. Delete Task from table: Choose Yes to delete the completed task from the table.
Validate and Approve Field Data

1. Click: Data Entry

2. Click: Result Entry

3. Click: Select

1. Search: Click the + for Order ID

2. Input Orders: Click the drop-down or type in the Order ID(s) to search.

3. Retrieve: Click retrieve.

4. Click: OK.
1. Validate List: Click the radio button for Results to Validate (field data).

2. Check Boxes: Click the + at the top of the column to check all the boxes below.

3. Validate: Click to validate results.

4. Approve List: Click the radio button for Results to Approve. Complete the same list of steps to Approve the field data (2 and 3 above).

Supplemental Data

1. Supplemental Template: Open the Supplemental template. Columns A, B, and C and Row 1 should be completed.

2. Supplemental Data: Complete Columns D-J as necessary.
1. **Supplemental Data Upload**: Should be completed along with the Field Data upload.

2. **Click**: DSW SUPP Field Data

3. **File select and upload**: Remaining process to select and upload the file mirrors the Field Data upload process.

Note: There is no validation or approval necessary for supplemental data.