	Assessment Information Management System Results Upload Template Instructions
	B-004-OWQ-WAP-TL-22-S-R1
	Standard Operating Procedure
	Office Water Quality
	Branch Watershed Assessment and Planning
	Section Technical and Logistical Services
	Last Revised November 14, 2022
	Revision Cycle 4 years
	Originally Effective April 30, 2016

Purpose

This standard operating procedure (SOP) provides instructions for collecting water quality data and uploading it into the Watershed Assessment and Planning Branch (WAPB) Assessment Information Management System (AIMS) using the AIMS_DataUploadTemplate_SamplesResults. The template is more commonly referred to as the AIMS Results Upload Template (ARUT). This SOP describes the "(required)" data columns of the ARUT, 2-Results sheet the customer must complete. External customers use the ARUT as a tool to enter and store their data for later upload into AIMS.
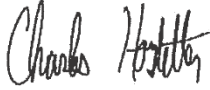
Scope

The secondary data coordinator (SDC) and other Indiana Department of Environmental Management (IDEM) WAPB staff assisting external customers submitting water quality data results use the ARUT. Staff are responsible for uploading these results into AIMS.

Authorizing Signatures

I approve and authorize this standard operating procedure:

_____   _11/3/2022_

Cynthia Jewell, SOP Implementer   Date

_____   _11/2/2022_

Charlie Hostetter, SOP Implementer   Date

_____   _11/2/2022_

Timothy Bowren, WAPB Quality Assurance Officer   Date
Technical and Logistical Services Section, Office of Water Quality
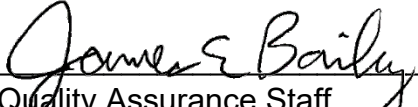

_____   _11/7/2022_

Caleb Rennaker, Chief, WAPB Quality Assurance Manager   Date
Technical and Logistical Services Section, Office of Water Quality

_____   _11/3/2022_

Kristen Arnold, Branch Chief
WAPB, Office of Water Quality

This standard operating procedure is consistent with agency requirements.

_____   _14 Nov 2022_

Quality Assurance Staff   Date
Indiana Department of Environmental Management

Table of Contents

1.0. Overview Flowchart

This overview flowchart displays where the ARUT fits into the overall process of storing external data in AIMS. Parts A and B in the flowchart provide the instructions for adding a project and sampling sites into AIMS. The completion of A and B must occur before staff is able to upload data results from the ARUT into AIMS. This SOP describes the process, circled in green, which deals with the components of the ARUT. This SOP emphasizes nonpoint source (NPS) data submittal, but also the use of the ARUT for other external data submittals.
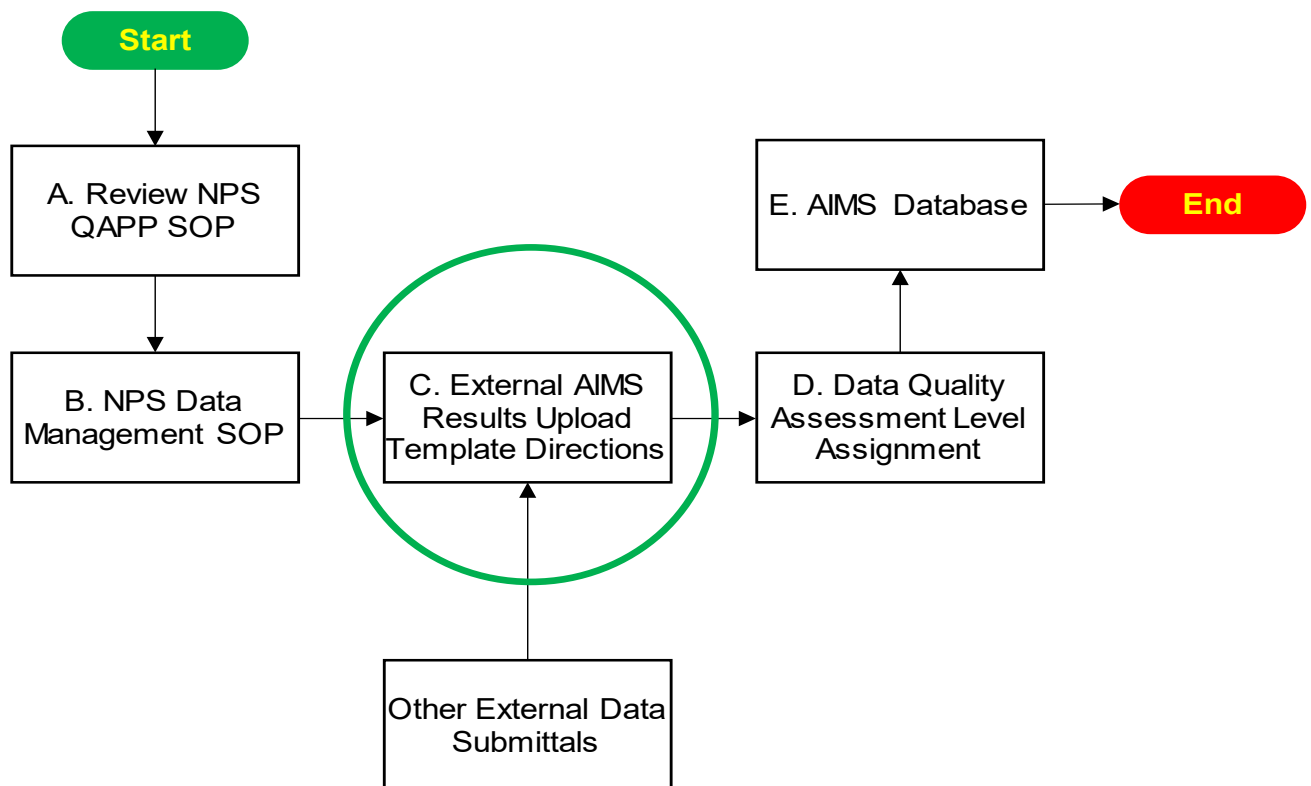
2.0. Procedural Steps

Step 1.   Technical and Logistical Services Section staff download the current version of the ARUT by signing onto AIMS and selecting the Upload Sample/Results Data link from the AIMS home page on the right side of the screen (Figure 1). After selecting the Upload Sample/Results Data link, select AIMS_DataUploadTemplate_SampleResults.xls from the list of templates on the Sample Data Upload page (Figure 2).

Figure 1 AIMS Home Page – Upload Sample/Results Data
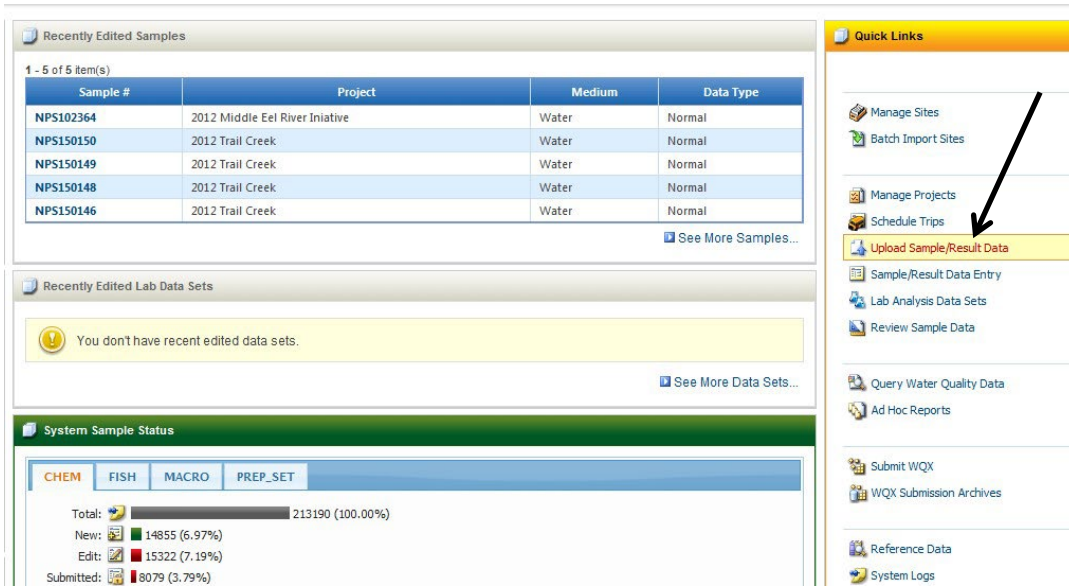
The Sample Data Upload Page displays the most up-to-date templates regarding the ARUT and Lakes data upload tool. (Figure 2).

Figure 2 AIMS Sample Data Upload Page
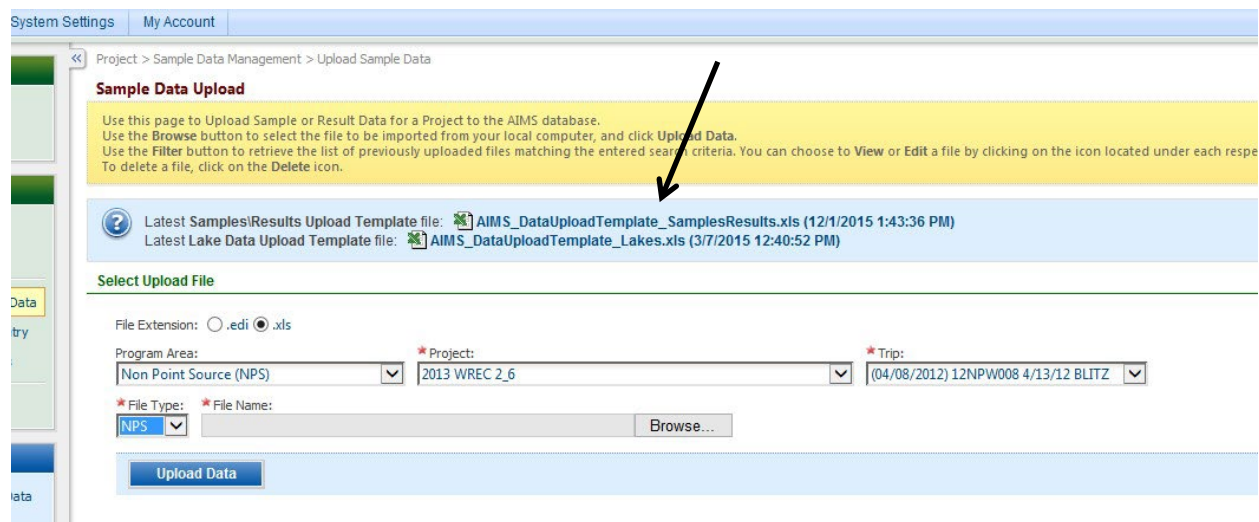
Step 2.   The Instructions sheet is the first tab in the ARUT.
Step 3.   Table 1 displays the NPS Project Information Table of the ARUT Instructions sheet. Table 2 is an example of how to adjust the table for other external customers outside of the NPS program.

Table 1 NPS Project Information Table

PROJECT INFO.	PLEASE FILL IN	EXAMPLE OF INFORMATION
Project Name		CLP 2000

PROJECT INFO.	PLEASE FILL IN	EXAMPLE OF INFORMATION
Grant Agreement		ARN 305-##-###
Contact Name		Betty Ratcliff
Contact Number		###-##-####
Email Address		bratclif@idem.in.gov

Table 2 External Customer Information Table

PROJECT INFO.	PLEASE FILL IN	EXAMPLE OF INFORMATION
Organization Name		CLP 2000
Contact Name		Betty Ratcliff
Contact Number		###-##-####
Email Address		bratclif@idem.in.gov

Step 4. The Instructions sheet also includes the Sites Information Table. The secondary data coordinator (SDC) will fill out the table according to the Nonpoint Source (NPS) Data Management SOP # S-002-OWQ-WAPTL-14-S-R1, Step 9. Figure 3 contains an example.

Figure 3 Sites Information Table (Example)

IDEM Site #	Latitude DD	Longitude DD	Stream Name and Short Description	Project Site # (Optional)
LMS-05-0002	38.33758	-85.79513	Burns Ditch, US 20	BD-1

Step 5. For Figure 3, the sampling sites Latitude DD and Longitude DD coordinates must be in decimal degrees. Do not include symbols for degrees, minutes, and seconds with the values.
An example of how decimal degrees should look for latitude is (38.33758) and for longitude is (-85.79513). Use of five decimal place numbers is typical.

Step 6. Convert degrees, minutes, and seconds to decimal degrees using equations A. and B.

A. Latitude DD = Degree + (Minute/60) + (Second/3600)
e.g., 38° 20' 15" converts to
38 + (20/60) + (15.300/3600) = 38.33758.

        B. Longitude DD = (-1)*(Degree + (Minute/60) + (Second/3600))

           e.g., 85° 47' 41" converts to

           (-1)*(85 + (47/60) + (41.298/3500)) = -85.79513.

Step 7.   When adding more rows in the Sites Information Table (Figure 3), insert the new rows in the middle of the table. Each IDEM Site # in the Sites Information Table then appears in the Column A drop-down list of the 2-Results sheet (the third tab) (Figure 4). Customers select from the drop-down list when entering data results.

Step 8.   The 2-Results sheet (Figure 4) contains water quality data results.

Figure 4 The Current ARUT 2-Results Sheet

Step 9.   Do not hide columns in the 2-Results sheet. Leave columns in the original order.

Step 10. Customers must fill out all columns tagged as "(required)" in notes for each column listed in Steps 12.-15. Determine "(required)" columns by hovering the pointer over a column header to display notes. Figure 5 displays a tagged column.

Figure 5 Note Identifying a "(required)" Column on the ARUT 2-Results Sheet

Step 11. For water chemistry, the required data columns necessary for a successful upload are Columns A, B, D, E, H, J or K, L, M, O, P, Q and R. For macroinvertebrates, the required data columns necessary for a successful upload are Columns A, B, D, E, H, AS, AT, AU, BA, and BB. For fish community, the required data columns necessary for a successful upload are Columns A, B, D, E, H, AC, and AD. Items A. through N. list each required column with the column title followed by the instructions for the column:

A. Column A (IDEM Site ID) requires the number assigned by AIMS during the site upload procedure in NPS Data Management SOP (S-002QWQ-WAP-TL-14-S-R1). Upon completion of filling out the Sites Information Table (Table 3), the drop-down list should provide the IDEM Site # for selection on the 2-Results sheet. A manual entry in this column of the IDEM Site ID will work fine.

B. Column B (Sample Date/Time) requires both the date and time. If the time is missing, the cell may assign zero time or midnight time.

C. Column D (Sample Type) contains a drop-down menu with five options:
  1. Normal, for sample results
  2. Duplicates
  3. Field Blank
  4. Equipment Blank
  5. Matrix Spikes, for additional quality control (QC) results.

D. Column E (Sample Media) from the drop-down menu, choose the appropriate media (e.g., Water, Macro, Fish_Community) for the sample. This selection lets AIMS format data for the Water Quality Portal correctly.

E. Column H (Lab/Field) from the drop-down menu, choose either Lab or Field dependent upon the protocol. For macro or fish community sample media use Field. Upon choosing the wrong selection and during upload in Step 16, an error message appears.

F. Column J (Protocol) or Column K (NPS Protocol) from the drop-down menu select the correct analytical method to obtain the concentration value. Make the selection in either column, but do not make the selection in both columns of the same row. If selections exist in both columns of the row, then delete one of the column entries.

G. Column L (Concentration) is the resulting concentration value. Enter the number based on the sensitivity of the method. (e.g., If the method or protocol has a sensitivity value of 0.01, then report

the concentration to the hundredths place. If the method or protocol list a sensitivity value of 1, then report the concentration value as a whole number. The QAO may adjust the concentration value to match the sensitivity using the Round function in Excel before uploading data results into AIMS. The only acceptable negative concentrations are for temperature protocols.

H. Column M (Units) choose one of the selections from the drop-down list (e.g., mg/L, cfu).

I. Column O (Detection Limit) and Column Q (Lab Report Limit) are either the minimum value the protocol suggests or the sensitivity limit, if the minimum value is negative. Temperature is one parameter using the sensitivity instead of the detection range. The NPS Protocol list has suggestions at the end of each description. Do not use ranges in the Column O (Detection Limit). Use the lower limit of the range unless the concentration value is above the upper limit, then use the upper limit value with a > flag.

J. Column P (Detection Limit Unit) and Column R (Lab Report Limit) select the appropriate value from the drop-down list.

K. Column AC (Fish Taxa) and Column BA (Macro Taxa) must correspond to a taxon in the appropriate taxa list in the "hidden" lookups tab on the ARUT. Misspelled taxa will generate an error message.

L. Column AD (Fish Count) and Column BB (Number of Individuals) must contain a numeric result.

M. Column AS (Macro Sample Type), Column AT (Macro Count Header), and Columns AU (Macro Sub-Sample) must have an entry selected from the drop-down list for each. Otherwise, the data may import but will not be viewable.

Step 12. Other columns not tagged as "(required)" are also useful and add information to assist in future data applications.

A. Column I (Parameter Category) choosing a parameter or protocol category from the drop-down list shortens both drop down lists for the Protocol and NPS Protocol columns. (Figure 5).

B. Column V (Lab Run Date/Time) when submitting QA/QC data, a customer must fill out the cell. When not submitting QA/QC data, a customer should fill out the cell. This is especially useful for protocols with short holding times such as *E.coli*.

C. Column N (QA Flags) flags identify results below and above the detection limit. To identify concentrations below the detection limit, replace the concentration value with -1 in the concentration column

and a < flag in Column N. To identify concentrations above the upper limit of a results range, add -2 in the concentration column and a > flag in Column N.

D. Column AE (Equipment) is for equipment used to catch fish. Select an item from drop-down menu when selecting fish community media.

E. Column BC (Notes (COMMENT_TEXT.RES_MACRO)) is for notes on Macroinvertebrate. Place results in the cell, when necessary.

Figure 6 The ARUT, 2-Results Sheet, Parameter Category Drop-down Menu.

F. Column N (QA Flags) identifies various QC issues, the For Reference-Flags sheet contains examples of qualifiers and flags. If using other flags and qualifiers substitute the current list with a customer list and description. Appendix A contains the ARUT For Reference-Flags sheet.

G. Column Z (Comment) fill out with explanations for applied qualifiers such as J estimated. Use the column to describe reasons for the estimated value. Be brief. Another example is if a quality control check such as pH standards do not meet the expected value, then insert flags or qualifiers such as Q into Column N (QA Flags). Add a short description such as "Standards outside limit". in Column Z. Sample rows with no results should not contain comments. Delete these rows.

Step 13. A completed ARUT could have several errors the SDC or QAO staff will need to correct before uploading the template into AIMS. Appendix B contains an example of the steps used in preparing the ARUT Template for AIMS upload.

Step 14.   Save the completed ARUT as an .xls file. Saving as an .xlsx or an .xlsm file will likely fail the upload process.

Step 15.   The QAO or SDC uploads the ARUT into AIMS. Figure 6 displays the Sample Data Upload page. Arrows point out a few of the areas requiring completion before uploading. Items A to I explain uploading results into AIMS.

A.   On the File extension line, select XLS.

B.   For Program Area, select NPS if for NPS data or external data.

C.   Under Program Area, select the project from the drop-down list such as 2013 WREC.

D.   Under Trip, select the trip number previously added to the project.

E.   On the next line under File Type, click NPS or Others from the drop-down list.

F.   Under File Name, use the Choose File button to select the file.

G.   Click on Upload Data.

H.   Wait about a minute. In Figure 6. the arrow points to the column Upload File Status, check to ensure a white check mark on a green circle appears. This indicates the file is ready to upload. Click on the tiny folder in the Import to Live column.

I.   If an X in a red circle appears, look at the error report column and review the items needing correction. After making the corrections, repeat Step 16 until the file is acceptable for Import to Live. Delete any file with errors because storage is unnecessary.

J.   After upload, the water chemistry results will be available to view by clicking the icon in the Edit column of the Uploaded File List in AIMS (Upload Sample/Result Data Figure 2)

Figure 7 AIMS Sample Data Upload Page
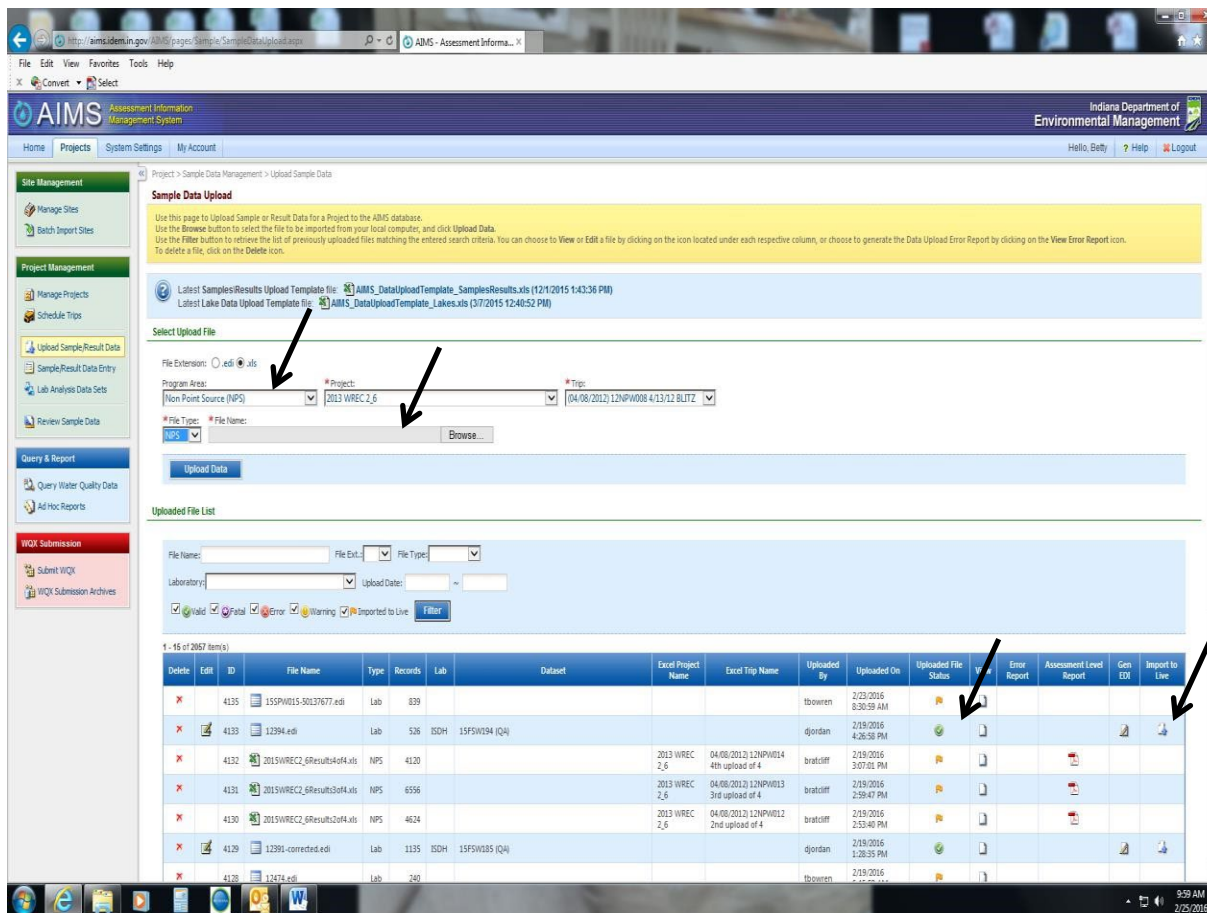
Step 16. Selecting Import to Live will bring up an ImportXML pop-up screen (Figure 7).
- A. Select either
    1. Append for the Import Method if the data is not already in AIMS.
    2. Replace if some or all the data are already in AIMS. If selecting Replace, prevent duplicates of the same data with different IDEM numbers in AIMS by requiring column AA (IDEM Sample Number).
- B. For Assessment Level, choose from the drop-down list.
    1. For NPS projects, select NPS #. Select appropriate number as determined by the QAO reviewing the data.
    2. For other external data select Assessment # choosing the appropriate number.
- C. Click OK.
- D. The data results are now available in AIMS.

Figure 8 Popup for Import Method and Assessment Level Selections
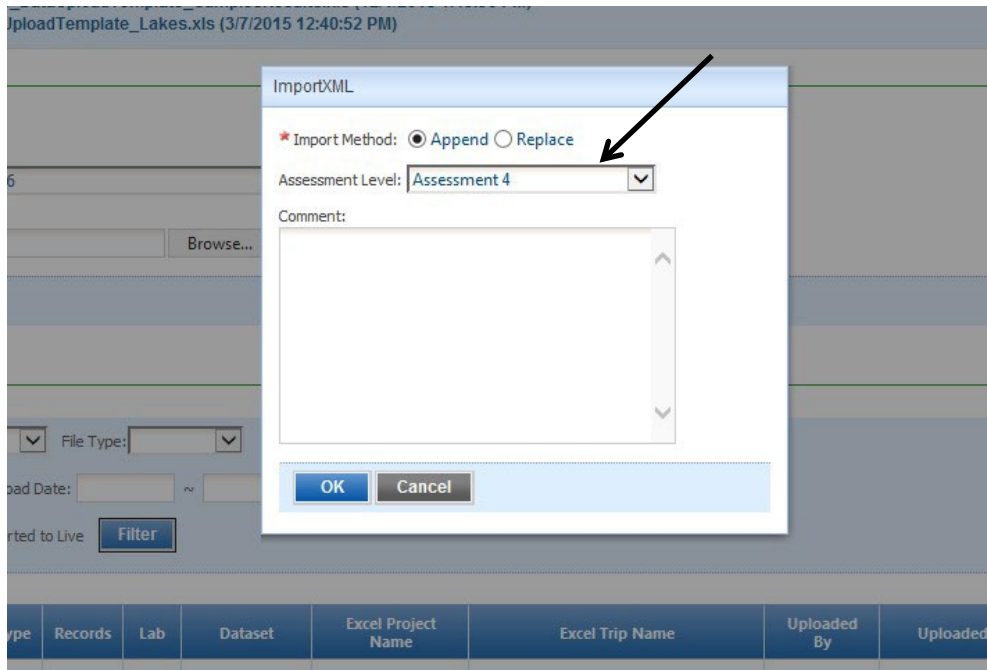
3.0. Training Requirements

3.1. AIMS database use
   A. Quality Assurance Officer
   B. Secondary Data Coordinator

4.0. Records Management

4.1. The AIMS Sample Data Upload Page now contains a link to the final version of the customer's ARUT (Figure 6).

4.2. For NPS grant funded projects, S:\IGCN\OWQ\AIMS\ARUT_Files contains an additional electronic copy under the fiscal year of the project's grant award and under the name of the project plus the grant ARN number.

4.3. Use the SharePoint NPS Tracking Page to track the process from receiving a QAPP for a project through importing the data into WQX.

5.0. Definitions

5.1. "319 Grant" – The federal Clean Water Act Section 319(h) provides funding for various nonpoint source projects which work to reduce water pollution. Use funds to conduct assessments, develop and implement total maximum daily loads (TMDLs) and watershed management plans, provide technical assistance, demonstrate new technology, and provide education

and outreach. Organizations eligible for funding include nonprofit organizations, universities, and local, state, or federal government agencies. Grants require a 40% (non-federal) in-kind or cash match of the total project cost. Only a 25% match is required for a planning or implementation project in a watershed including waterbodies impaired by nonpoint sources of pollution as listed on the 2004 303(d) List of Impaired Waterbodies. The Watershed Planning and Restoration Section administers the Section 319(h) Program for Indiana (S-001-OWQ-W-WE-08-S-R0).

5.2. "NPS number" – A serial numbering process the Watershed Assessment and Planning Branch uses to identify samples collected under a specific NPS Data QAPP. The NPS prefix begins the number assigned in order from 1 to 99,000. The resulting unique identifying number for a sampling event links all sample parameters measurements and collection date and time. This number identifies the NPS sampling event in the Assessment Information Management System database (AIMS database).

5.3. "Assessment Information Management System database (AIMS database)" – IDEM database containing information related to water chemistry, aquatic habitat, macroinvertebrate and fish communities, fish tissue analyses, sediments, algae, and *E. coli* bacteria data generation through WAPB, External Data Framework, and NPS sampling events.

5.4. "Customer" – Sponsor or person in charge of projects awarded NPS funds through a contract with the state.

5.5. "Data quality indicator (DQI)" – Precision, accuracy or bias, completeness, representativeness, sensitivity, and comparability.

5.6. "External data" – Refer to Secondary Data.

5.7. "Nonpoint source (NPS)" – Pollution originating from diffuse sources over a relatively large area. Nonpoint sources can either relate to land or water use including failing septic tanks, improper animal-keeping practices, forest practices, and urban and rural runoff (S-001-OWQ-W-WE-08-S-R1).

5.8. "Nonpoint source projects" – Watershed projects receiving 319 and 205j grants funding and under Watershed Planning and Restoration Section project managers management.

5.9. "Nonpoint source quality assurance officer" – IDEM staff assigned to review watershed project QAPPs as part of the contract elements when a 319 or 205j grant funds environmental water quality sampling. Follow U.S. EPA guidance for QAPP development.

5.10. "Quality Assurance Officer (QAO)" – An agency staff member in the program areas responsible for ensuring quality assurance criteria are met.

5.11. "Secondary data (also known as acquired data)" – Existing data or information for use in project implementation or decision-making, which meets one of the following criteria: 1) Compilation from other sources outside of the WAPB; 2) Original collection for other purposes; 3) Obtained from nonmeasurement sources such as computer databases, programs, scientific literature, and historical databases.

5.12. Secondary data coordinator (SDC) –Technical and Logistical Services Section staff member responsible for checking and filling in site and protocol information in the instructions tab of an ARUT. Sends the ARUT to the watershed coordinator. Upon arrival of a completed ARUT, the SDC notifies the appropriate QAO for review of data.

5.13. "Watershed coordinator (WC)" – The grantee's coordinator responsible for managing the NPS project and coordinating all project related activities. In this SOP, the WC is either the originator of the QAPP or is responsible for the completion of the QAPP.

6.0. References

6.1. AIMSII User Guide.03/25/2022, SharePoint, Technical Logistical Services Section, OWQ, IDEM, Shared Documents. 📄 AIMSII User Guide-05162022.pdf

6.2. Nonpoint Source (NPS) Data Management SOP. (S-002-OWQ-WAP-TL-14S-R1

6.3. Quality Assurance Project Plan Review for Nonpoint Source Projects SOP. (S-001-OWQ-WAP-TL-13-S-RO). Reviewing Nonpoint Source (NPS) Grantee QAPPs S-001-OWQ-W-TL-13-S-R0.docx

Appendix A AIMS Upload Results Template Reference-Flags

Data Qualifiers and Flags are applied to Environmental Results that do not meet the Required QC limits.

	Data Qualifier Definitions for Environmental Results for NPS Funded Projects
	(Sometimes Qualifiers will also be used with a Flag in the DQI Sheet as an Explanation for applying the Qualifier.)
U	The parameter result was not detected above the method detection limit. This Qualifier is typically used in analytical laboratories that provide data packages. NPS Projects may use this qualifier for a result that is below the reporting limit.
J	The result is an estimated quantity and the numerical value is the approximate concentration of the parameter in the sample.
J+	The result is an estimated quantity and may be biased high. Used for NPS projects to identify a contaminant found in a field blank collected during a sampling event.
R	The data are unusable due to serious deficiencies in meeting quality control criteria.

Table 2:	Flags and their Application for Environmental Results for NPS Projects
Q	Quality Control Checks, (Accuracy DQI) one or more QC checks or criteria were "Out of Control."
	1. For data sets, when at least two QC checks or criteria was "Out of Control" a QJ flag should be added to results in data set. If only one parameter is involved then only that specific parameter should be flagged. The QJ flag & qualifier identifies the result as being an estimated value due to "Out of Control" QC checks.
	2. For data sets that have many QC checks or criteria "Out of Control", professional judgment should be applied and if determined necessary then a QR flag should be applied. The QR flag and qualifier identified the result as rejected due to the multiple "Out of Control" QC Checks.
H	Holding Time flag is applied with the Qualifiers "J" or "R" when the holding time was not met.
	1. The analysis exceeded the holding time by 1.5 times or less. The Result will be estimated (HJ)
	2. The analysis exceeded holding time by greater than 1.5 times. The Result will be Rejected (HR).
D (SS)	If Laboratory Splits sample for a duplicate analysis, then a control limit set by the analytical laboratory will be used for an acceptance criteria. The D flags for the SS or Laboratory Split samples are typically used for DQAL3 results.
DJ (SS)	For Laboratory Split sample, if RPD is between established control limits and two times the established control limits, then the sample will be estimated. Assign as needed.

APPENDIX B: Correcting ARUT

A completed ARUT could have several errors the QAO or SDC will need to correct before uploading the Template into AIMS. One example of the steps for preparation of the template for entry into AIMS follows.

A. Custom Sort by NPS Protocol or Protocol if the column is used.

B. **Delete empty rows; rows not having concentration values**. Keep water, macroinvertebrate, and fish community data in separate ARUTs. The main reason for the separate ARUTs is each sample media may have different assessment levels.

C. Column B (Sample Date/Time) – Change format to Date and 1/11/13 9:00:00 PM. Check the time of each sample to make sure it is reasonable (e.g., 1:18 AM should be 1:18 PM).

D. Column D (Sample Type) – A required column so make sure it is filled out. The cell should be listed as Normal unless the sample is a (field) blank, (field) duplicate, or MS/MSD. If duplicates exist, Columns A (IDEM Site #) and B (Sample Date/Time) should match. Also, select from the drop-down menus whenever available instead of typing in values. For (field) blanks, the Site_ID is BLANK.
NOTE: If field duplicates exist, manually add the duplicate's parent sample into AIMS after importation of the data.

E. Column E (Sample Media) – A required column so make sure it is filled out. Use the drop-down menu to select the appropriate sample media.

F. Column H (Lab/Field Ind) – For some NPS Protocols use the stated lab or field. Otherwise, DO is Field; E. coli is Lab; Habitat (any type or cQHEI); Macroinvertebrate and Fish Community is Field; Nitrogen, Nitrate+Nitrite is typically Lab; pH is typically Field; Phosphorus, Total is Lab; Solids, Suspended Total is Lab; Specific Conductance is usually Field; Temperature is Field; and Turbidity can be either. However, if a test strip method is used, always Field.

G. Column K (NPS Protocol) – If entered correctly, cells should have a green color. If the cell is white, data was possibly not entered using the drop-down menu. Use the drop-down menu to select the protocol identical to the current one. If necessary, expand the cell width to see the entire protocol. Note: If errors persist after uploading to AIMS, possibly copy the data into a new template. If copying to a new template, remember to copy contact and site information from Sheet 1 of the spreadsheet.

H. Column M (Unit) and Column P (Detection Limit Unit) – If missing, look at the NPS protocol and use the suggested unit (select from drop-down menu) or determine from the QAPP. Column M and P should have the same values.

I. Column O (Detection Limit) – The cell cannot have negative numbers or zero. The detection limit for DO and Temperature should be 0.01. It is ok if the detection limit is lower than the one stated in the NPS protocol. If blank or looks unreasonable (usually too high), look at the NPS protocol or QAPP and use the suggested value.

J. Column N (QA Flags) – Check to ensure the flag makes sense. If they do not, delete them.

K. Column L (Concentration) – If a concentration is less than the value in Column O (Detection Limit), change the number in Column L to -1 and enter <in Column N (QA Flags).

L. Input the following formula into Column N: =IF (L2<O2, "<", "") to single out instances of concentrations less than the detection limit (alternatively, use a filter). Then go through the dataset to change the concentrations having a <in Column N to -1.

M. For cells missing the drop-down menu in a column having a drop-down menu, it is possible rows past the original 2000 are not correctly formatted. To correct the format the cell, copy and paste the format from another cell.

N. Save the final ARUT file should as an .xls file. Do not save as an .xlsx, or an .xlsm file which will generally cause an upload to fail.