



The stream study – What is your plan?

Provided here is information to help you organize your monitoring plan, or study [design](#). Think carefully about the why, what, where, when and how questions, and consider the ([QAQC](#)) measures that are necessary to insure accuracy and precision. It is beneficial to figure out what you want to do in advance. Your monitoring program is more likely to be successful and sustainable with the **right plan**.

Organize your technical committee.

List the members of your technical committee and their expertise. Write a job description of the roles and responsibilities of the technical committee members.

Why are you monitoring?

1. Provide background information on your stream: For example, describe the geography of your stream, where it begins, where it joins larger water bodies and other important characteristics of its [watershed](#).
2. List (or map) the [classifications](#), designated uses or other ecological values associated with your stream.
3. Describe the issues facing your stream posed by the threats or conflicts and what, if anything is being done to address them?
 - List the stream segments that do not support, or only partially support, their uses.
 - List the causes or reasons that specific stream segments do not support their uses.
 - List the protection or restoration efforts underway to address the problems.
 - List the information that you believe you will need to address the issues.

What will you monitor?

1. List the indicators you will use to monitor your stream.
2. Describe the significances of each indicator and how they will help answer your questions.

What are your Data Quality Objectives (DQOs)? DQOs are statements regarding the precision, bias, representativeness, completeness, and comparability needed for acceptable data.

1. List the intended uses and users of your information.
2. List your data quality objectives.
3. List your data quality requirements of the sampling and analysis of each indicator:
 - Accuracy is how close are your results are to the true values.
 - Precision is how close are your results are to each other.
 - Sensitivity is the smallest change or lowest concentration you seek to detect.

How will you monitor? Describe how you will collect your samples. If you are using a specific program (e.g., WV Save Our Streams) you will only need to reference its [standard operating procedures](#) (SOPs).

- What will be sampled (e.g., the water, bottom sediment, aquatic life etc.)?
- List the types of sampling containers and/or other equipment to be used.
- What quantity of sample(s) will be collected?
- How many samples will your monitoring team collect at each location?
- Provide a description of your procedures (reference a particular method if applicable).

Note: WV Save Our Streams SOPs do not provide information on the use of any specific chemical kits or meters. The Coordinator recommends that whatever type of kit you choose to use, always follow the manufactures instructions and recommendations for its use and care. If you are using a meter; these must be calibrated at regular intervals and always before using them in the field. When submitting chemical data always describe the kit. The description should include the manufacturer, kit-type, range, model number etc.

Stream Study Design

Where will you monitor?

1. List the criteria you used to select sampling sites.
2. List each sampling site and the rationale for each one. This could be a table with the following column heading:
 - Site “station” Number and/or name.
 - How the site be sampled (e.g., wading, from shore, by boat etc.).
 - Why the site is being monitored.
3. List where each indicator will be analyzed (field or lab etc.).

When will you monitor?

1. List the sampling and analysis dates for each type of sampling.
2. List the time of day each sample will be taken.
3. List the holding times for each type of sample.
4. Define your index period if collecting benthics, fish, algae etc.

Who will monitor?

1. List the paid and volunteer positions:
 - Title
 - Responsibility
 - Name, address, phone number, E-mail etc.

What Are You QAQC measures?

1. List the quality assurance and quality control (QAQC) measures you will use:
 - External checks
 - Internal checks
2. Describe each one and how it will be carried out.

Put your plan in writing and review it annually.

The members of your technical committee should complete the annual review with input from others, especially field personnel.

Quality Assurance Project Plan

In certain circumstances, such as federally funded monitoring projects, your plan will need to be expanded to include a [Quality Assurance Project Plan \(QAPP\)](#). A QAPP integrates all technical and quality aspects of a project, including planning, implementation, and assessment. If you have a written/approved study design or QAPP, your organization's data may be useful for WVDEP's Bi-annual [Integrated Report](#).

Questions? Email Callie.C.Sams@wv.gov WV Save Our Streams Coordinator or Martin.J.Christ@wv.gov Northern Basin Coordinator and resident QAPP expert.

An excellent resource is ALLARM's study design manual. Download it at: https://dep.wv.gov/WWE/getinvolved/sos/Documents/ALLARM_studydesignmanual.pdf