**Quality Assurance Project Plan (QAPP) Development Template and Instructions Using the Graded Approach**

A Quality Assurance Project Plan, or QAPP, is a critical planning document for environmental information operations because it documents how environmental information operations are planned, implemented, documented, and assessed during the life cycle of a program, project, or task. All work performed by or on behalf of EPA involving environmental information operations must be implemented in accordance with an approved QAPP.

These instructions, along with the attached QAPP Template, are intended to aid organizations that conduct environmental information operations in preparing QAPPs using the graded approach.

The graded approach refers to the level of detail required in the QAPP and is commensurate with the complexity and type of work, how the results will be used, and the available resources. The level of detail to be applied to the activities described in the QAPP are developed and then documented according to the intended use and the degree of confidence needed in the quality of the results. The graded approach is not a mechanism to waive required QAPP elements. If an element is not applicable to the project, an explanation as to why it is not applicable must be provided in the QAPP.

**IMPORTANT INFORMATION:**

The QAPP Template is provided as Attachment 1 at the end of these instructions (beginning on page 46). The instructions on pages 1 through 45 include information and examples to help guide you through the QAPP development process. Reach out to your EPA Project Officer if you need additional support or have questions about these instructions or the QAPP Template.

The QAPP Template is arranged into four general groups, each with specific required elements (i.e., sections):

Group A Project Management and Information/Data Quality Objectives

Group B Implementing Environmental Information Operations

Group C Assessment, Response Actions, and Oversight

Group D Environmental Information Review and Usability Determination

Each section of the QAPP Template corresponds to the required elements of EPA’s Quality Assurance Project Plan Standard (S-2), which can be found at:

<https://www.epa.gov/quality/quality-program-directives>

All sections of the QAPP Template must be presented in the final QAPP and should not be deleted. If a section of the QAPP Template is not applicable to your specific project, indicate that the section is not applicable in the QAPP Template and include an explanation as to why the section is not applicable (e.g., “This section of the QAPP is not applicable because the project does not involve sample collection or analysis.”).

Instructions are provided for completing each section of the QAPP Template, and in many cases, tips and other information, such as examples, are also provided. Where the instructions include examples, remember that they are only examples of the type of information that may be included in that particular section of the QAPP. Examples are for reference only and should not be copied directly into your QAPP.

Tables in the QAPP template may be modified, replaced, or deleted based on your project-specific needs. However, each section must still contain the required information indicated in the instructions for that section.

For questions about QAPP requirements, the QAPP template, and/or these QAPP instructions, please reach out to your EPA Project Officer.

**SEPARATE THE QAPP TEMPLATE FROM THESE INSTRUCTIONS:**

When submitting your QAPP to EPA for review and approval, you should submit the QAPP only without the instructions. As such, it is recommended that you separate the instructions and the QAPP Template prior to preparing the QAPP. By separating them early, you will be able to view the instructions side-by-side with the template, which may make it easier to complete each section of the QAPP. To separate the instructions and the QAPP Template, follow these step-by-step instructions:

1. Save a duplicate copy of the QAPP Template and Instructions file.
2. Rename the duplicate file copy in accordance with your organization’s file naming convention – this will be the draft version of your project-specific QAPP.
3. Open the draft version of your project-specific QAPP.
4. Delete pages 1 through 45.
   1. Place your cursor at the very beginning of these instructions, in front of the word “Instructions.”
   2. Scroll to page 46, which is the title page of the QAPP.
   3. Hold down the ‘Shift’ key and place your cursor at the very beginning of page 46, in front of “U.S.”
   4. Press the ‘Delete’ key.
5. The instructions should be deleted now, and the first page of the QAPP should be the title page.
6. Fill-out the QAPP template using the instructions in the original QAPP Template and Instructions file.

**PRIOR TO SUBMITTING YOUR QAPP TO EPA:**

1. Separate these instructions from the QAPP Template.
2. Replace text that is highlighted yellow with project-specific information.
3. Add additional information, as necessary, to reflect project-specific information.
4. Update the Table of Contents, including lists of figures and appendices.
5. Leave the EPA document control number in the footer for traceability.

**DISCLAIMER:**

EPA does not consider this QAPP template an official Agency dissemination of information under the Agency's Information Quality Guidelines because it is not being used to formulate or support a regulation or guidance or to represent a final Agency decision or position. This template describes a quality assurance approach that could be used for a project that involves environmental information operations using the graded approach.

**QAPP Cover Page and Headers**

**Instructions:**

The items on the cover page that are highlighted yellow need to be replaced with the following project-specific information:

Organization Name

Organization Address

Project Title

Grant, Contract, or Interagency Agreement Number

Date of the QAPP

QAPP Revision Number

Beginning on page 2 of the QAPP, insert the QAPP Title (abbreviations are acceptable) and QAPP Date and Revision Number in the header. Do not delete the section title (left side of header) or page numbers from the header. Note that the QAPP Title and QAPP Date and Revision Number will need to be added to the different sections of the QAPP (Sections A, B, C, D), as indicated in the header.

**Tips and Other Information:**

The section titles in the left header (A – Project Management and Information/Data Quality Objectives, B – Implementing Environmental Information Operations, C – Assessment and Oversight, and D – Environmental Information Review and Usability Determination) correspond to the four general groups discussed in S-2, EPA’s Quality Assurance Project Plan Standard (<https://www.epa.gov/quality/quality-program-directives>).

Below is an example of what the header should look like:

|  |  |  |
| --- | --- | --- |
| A – Project Management and Information/Data Quality Objectives | | QAPP for Air Pollution Monitoring in  Disadvantaged Communities |
|  | | March 2024, Revision 1 |
|  | Page 2 of 35 | |

# 

# A1. Title Page

**Instructions:**

Add the following information to the Title Page:

* Project title
* Date of QAPP preparation
* Name of the organization conducting the environmental information operations
* Name of the organization that developed the QAPP (if different from the organization conducting the work)
* Period of Applicability
* QAPP Revision Number
* Grant, contract, or interagency agreement number

**Tips and Other Information:**

If the organization that prepared the QAPP is the same as the organization conducting the environmental information operations, then enter “same as above” on the line for the organization that prepared the QAPP.

If the organization that prepared the QAPP is different than the organization conducting the environmental information operations, the Title Page should include the names of both organizations (e.g., Prepared By [organization name] and Prepared For [organization name]).

For the period of applicability, the QAPP should state, “Up to 5 years from the date of EPA RQAM or DAO approval.” This statement is already included in the QAPP Template.

# A2. Approval Page

**Instructions:**

Add the names of the organization’s Quality Assurance Manager (QAM) and Operations Manager (i.e., Project Manager). Note that the QAM must be independent of all environmental information operations (e.g., sample collection, conducting surveys, etc.), and therefore, the roles of QAM and Operations Manager cannot be held by the same person.

Add the name of the EPA Region 8 Project Officer and either the Regional Quality Assurance Manager (RQAM) or Delegated Approving Official (DAO). Note that if this information is unknown, leave blank and it can be filled in when the QAPP is received by EPA.

**Tips and Other Information:**

The signatures on the Approval Page indicate that officials have reviewed the QAPP and concur with its implementation as it is written. It is the organization’s responsibility to make sure all signatures are in place before work begins.

Quality Assurance Manager

Organizations should identify and assign a QAM that has the authority to conduct independent oversight of the organization’s QAPP implementation. The QAM authority is independent of all environmental information operations/data collection activities. Generally, the QAM focuses on ensuring the project outcomes meet the standards and requirements stated in the QAPP.

The QAM does not have the authority to sign QA documentation for the Operations Manager.

Operations Manager

Generally, the Operations Manager focuses on overall planning and implementation of the project as it is described in the QAPP.

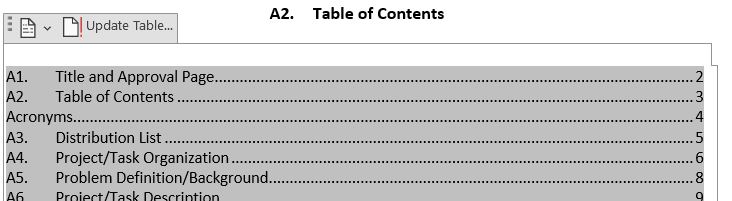
The Operations Manager does not have authority to sign QA documentation for the QAM.

The roles of the QAM and Operations Manager must remain independent of each other. In small organizations, it is possible that these two roles may be combined with approval of the EPA RQAM. Please reach out to your EPA Project Officer if it is necessary to combine the QAM and Operations Manager roles. The EPA Project Officer will communicate with the RQAM to consider the request.

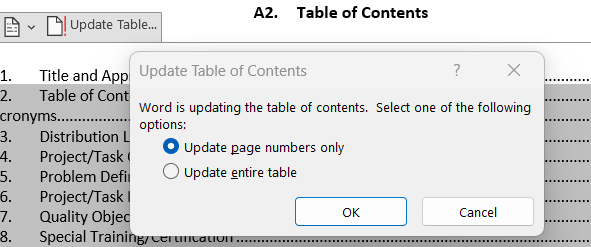
# A3. Table of Contents

**Instructions:**

To update the Table of Contents (TOC), click anywhere in the TOC, and then click “Update Table,” which appears at the top left corner of the TOC, as indicated below.



A dialogue box will appear. Select “Update page numbers only,” as indicated in the screenshot, below. Do not change any section numbers or titles.



List of Figures:

List any figures and/or maps included in the QAPP. Note that Figure 1, Project Organization Chart, is a required element and should not be deleted from the QAPP (see Section A10). Suggestions for additional figures you may add to the QAPP include a site location map, a map showing sampling locations, and diagrams of specific equipment or mitigation systems.

Appendices:

List any appendices included in the QAPP. Below are examples of appendices that may be added to the QAPP.

Appendix A Standard Operating Procedures

Appendix B Field Forms (e.g., sample chain of custody, field equipment calibration logs, etc.)

Appendix C Laboratory Certificate of Accreditation

Appendix D Checklists (e.g., assessment, data verification, data validation, etc.)

**Tips and Other Information:**

The TOC should be updated after all other required information has been added to the QAPP. This ensures that the page numbers listed in the TOC are accurate.

# Acronyms

**Instructions:**

The acronyms listed below are already included in the QAPP template and should not be deleted. List any additional acronyms and abbreviations used in the QAPP text. Note that acronyms and abbreviations should be spelled out the first time they are used in the text with the acronym/abbreviation in parentheses. For example: “Standard operating procedures (SOPs) for field activities are provided in Appendix A.” Then, the acronym (e.g., SOPs) should be used in the remainder of the text.

DAO Delegated Approving Official

DCN Document Control Number

DQI Data Quality Indicator

DQO Data Quality Objective

EIO Environmental Information Operations

EPA U.S. Environmental Protection Agency

PAL Project Action Level

QA Quality Assurance

QAM Quality Assurance Manager

QAPP Quality Assurance Project Plan

QC Quality Control

RQAM Regional Quality Assurance Manager

SOP Standard Operating Procedure

# A4. Project Purpose, Problem Definition, and Background

**Instructions:**

Project purpose and problem definition

The QAPP should describe the purpose of the project’s environmental information operations (e.g., research, monitoring, environmental technology for clean-up).

State the specific problem(s) to be solved, decision(s) to be made, and outcome(s) to be achieved.

Project background

Include sufficient background information to provide a historical, scientific, and regulatory perspective for this particular project.

**Tips and Other Information:**

This information should already be included in your project narrative/workplan (or equivalent document), so you can copy and paste the information into this section, rather than rewriting it.

# A5. Project Task Description

**Instructions:**

Provide a summary of all work to be performed, products to be produced, and the schedule for implementation. Provide maps or tables that show or state the geographic locations of field tasks (a map generated from Google Maps is acceptable).

Use the Project Schedule Timeline table provided in the QAPP template to present the project milestones timeline.

**Tips and Other Information:**

This information should already be included in the project narrative/workplan (or equivalent document), so you can copy and paste the information into this section, rather than rewriting it.

If the project narrative/workplan (or equivalent document) already includes a Project Timeline and Milestones table (or equivalent), you may delete the Project Schedule Timeline table from the QAPP template and then copy and paste the Project Timeline and Milestones table from the workplan into the QAPP. However, make sure the Project Timeline and Milestones table includes QA activities, such as preparing and finalizing the QAPP and data evaluation.

# A6. Information/Data Quality Objectives and Performance/Acceptance Criteria

**Instructions:**

The data quality objectives (DQOs) process is a series of steps that guide project managers and staff to plan for their project and meet project goals. The DQO process is used to establish the criteria that serve as the basis for designing a plan for collecting environmental information/data of sufficient quality and quantity to support the goals of the project and achieve the stated outcomes described in the project narrative/workplan.

In the QAPP template, discuss the DQOs for the project and the criteria to achieve those objectives. EPA requires the use of a systematic planning process to define these DQOs (e.g., EPA QA/G-4, Guidance on Systematic Planning Using the Data Quality Objectives Process, dated February 2006 – see link under Tips and Other Information below). Note that much of this information may already be included in your project narrative/workplan, so you can copy and paste the information into this section. See additional subsections and instructions below.

**Step 1: State the Problem**

Summarize the information you included in QAPP Section A4 (Project Purpose, Problem Definition, and Background). This section should describe the environmental issue(s) the project is trying to address.

**Step 2: Identify the Goals of the Study**

* Describe the goal(s) of the project (i.e., what the project hopes to accomplish)
* List any study questions (i.e., what questions do you want answered at the end of the project). See the examples below:
  + Does the contaminant concentration exceed the action level (see Step #5 below)?
  + Does the contaminant concentration pose a risk to human health or the environment?
  + What is the primary environmental concern of residents in ABC community?
  + What is the contaminant distribution over space and time?
  + How many people are potentially exposed to a contaminant?
  + Have the glaciers in Grand Teton National Park retreated over the last 100 years?
* Describe how the data/information collected will be used to answer the study questions

Note that the goals of the study should align with the stated outcomes in the project narrative/workplan.

**Step 3: Identify Information Inputs**

Describe/list all of the information needed to answer the study questions in Step #2 and meet the goals of the study. Examples of information inputs include the following:

* Existing data/information (see note below)
* Data/information collected during this project (e.g., field measurements, observations)
* U.S. Census data
* Information provided by the analytical laboratory

Note that when existing data/information (also called secondary data or non-direct measurements) (i.e., data generated for purposes other than your specific project or data pertinent to your project but generated under a separate QAPP) is used, the QAPP should describe specifically how the existing data/information will be used, as well as the source of the existing data/information. The project team should carefully evaluate the quality of the existing data/information to ensure they are of the type and quality necessary to support their intended use. Examples of existing data/information include the following: sampling and testing data collected during previous investigations, historical data, background information, interviews, modeling data, photographs, aerial photographs, topographic maps, and published literature on geology, climate, population distributions, endangered species, etc.

**Step 4: Define the Boundaries of the Study**

* Define the target population of interest (i.e., who or what you are investigating)
* Describe relevant spatial boundaries (i.e., geographical boundaries – physical area to be studied and generally where samples/information will be collected)
* Describe temporal boundaries (i.e., the timeframe that the study will represent and when samples/data should be collected)
* Discuss other practical constraints associated with information/data collection (e.g., property access, availability of equipment, environmental conditions, such as high humidity, wind, or freezing temperatures)

**Step 5: Develop the Analytic Approach**

Projects involving sample collection and analysis:

* Choose an action level, if applicable. The action level is the concentration of a contaminant (e.g., lead, radon, asbestos) that when exceeded is considered harmful or toxic to human health or the environment.
* State the analytical method(s) that will be used to analyze the samples and confirm that the laboratory/instrument-specific reporting limits are below the action level (e.g., if the chosen action level for radon is 4 picocuries per liter [pCi/L], then the analytical method and laboratory instrument that will be used to analyze samples should be able to detect radon at concentrations less than 4 pCi/L).
* Develop “If…, then…” statements with alternative outcomes. For example:

If the indoor radon concentration exceeds 4 pCi/L, then mitigation assistance will be provided.

If the indoor radon concentration does not exceed 4 pCi/L, then no further action is required at this time.

Projects involving conducting surveys:

* Determine how the survey will be administered (e.g., online, in-person, mail, phone, etc.).
* Determine how survey participants will be notified of the survey.
* Determine survey participant demographics (e.g., high school students, residents within 5 miles of a specific landmark, etc.).
* Determine if personally identifiable information will be collected (e.g., names, addresses, ages, annual income, etc.) and how it will be managed.
* Determine the survey response time needed (e.g., completed surveys must be returned within 30 calendar days).
* Determine whether a pilot survey will be administered to a subset of the target population to ensure the questions are easily understood, the survey is accessible for participants with disabilities, language barriers are addressed, etc.
* Develop “If…, then…” statements with alternative outcomes. For example:

If survey questions were not understood during the pilot survey, then the project team will rewrite the questions, and another pilot study will be administered.

If insufficient surveys are returned by the selected survey participants, then an additional group of 100 survey participants will be selected following the procedures in QAPP Sections B1 and B2.

Projects involving the use of existing data/information:

Describe the criteria that will be used to determine whether an existing dataset is acceptable for use on your project. Consider the following:

* Determine your data/information needs.
* Identify different source(s) of existing data/information, including how data will be prioritized for selection.
* Consider the source of the existing data/information and its acceptability to answer the study questions in Step #2. Existing data/information from each source cannot automatically be considered “good.” A determination as to the quality and appropriateness of its use for the project is always required. For example, if you are using photographs to visually measure the retreat of glaciers in Grand Teton National Park, photographs from a government website might be a more precise source than your friend’s vacation photos.
* Determine if there are any programmatic, legal, or any other constraints on the use of the existing data/information and their impact on the project (e.g., staff do not have the necessary clearance to access proprietary or confidential data).
* Describe any potential ramifications of both the inclusion and exclusion of existing data/information sources with limitations on the project’s objectives.

When determining the appropriateness of existing data/information for use on the project, you must establish your data needs and acceptance criteria and evaluate the source(s) of the existing data/information against the acceptance criteria, as well as the individual data points within each data/information source. For example, if the project aims to measure the retreat of glaciers in Grand Teton National Park over the last 100 years, estimating the size of the glaciers over time might be done using current and historic photographs. When determining which photographs are appropriate for use, the first step is to evaluate the source(s) of available photographs, and the second step is to evaluate the individual photographs to determine if they should or should not be used to make the estimation, in this case a decision or conclusion about glacial retreat.

The table below is an example of how potential sources of existing data/information are evaluated against the established acceptance criteria for the project (using the example project of measuring glacial retreat in Grand Teton National Park with photographs):

|  |  |  |  |
| --- | --- | --- | --- |
| **Acceptance Criteria** | **Potential Existing Information Sources** | | |
| Photographs from U.S. National Park Service | Vacation Photos | Satellite Images from NASA |
| GPS data are available | x |  | x |
| Photos are available at least every 5 years for the last 100 years | x |  |  |
| Photos are available from the same yearly timeframe (January-February) | x | x | x |
| Photos are available from the same viewpoint (plan view/overhead perspective) | x | x | x |
| Photos are from a verified and reputable source | x |  | x |

In this first step, specify the minimum acceptance criteria that each data source must meet in order for the source to be evaluated during the next step (e.g., for a source of photographs to be considered usable for the current purpose, it must meet all the acceptance criteria in the above table).

Once the data/information source(s) have been evaluated and selected, describe the criteria that will be used to determine the acceptability of each data point.

The table below is an example of how to evaluate individual data points (using the example project of measuring glacial retreat in Grand Teton National Park with photographs):

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Type** | **Data Source** | **Existing information uses relative  to current project** | **Acceptance criteria, factors  affecting the reliability of data, and limitations on data use** |
| Individual Photographs | U.S. National Park Service | Visually measure the retreat of glaciers in Grand Teton National Park | * Photo is clear with distinguishable landmarks * Nothing is blocking the view of the Grand Tetons (people, wildlife, trees, etc.) * GPS coordinates are available * The viewpoint of the image is facing northwest * The photo includes a date and time stamp * The photo was taken in January or February * The photo was taken within 5 years of the previous photo |

Once the source(s) of the existing data/information, as well as the individual data points within each data/information source, have been evaluated and determined appropriate for answering the study questions in Step #2 of the DQO process, the existing data/information set can be downloaded, incorporated into the current study dataset, compiled, and documented for use.

**Step 6: Specify Performance or Acceptance Criteria**

Performance or acceptance criteria are needed to ensure the collected information/data will meet the project goals described in Step #2.

Performance and acceptance criteria are often expressed in terms of data quality indicators (DQIs). DQIs will look different for different types of projects (e.g., sample collection and analysis, surveys, use of existing data/information). See the subsections below for more information on how DQIs may be developed for your specific project.

Projects involving sample collection and analysis:

DQIs for projects involving sample collection and analysis include precision, accuracy/bias, representativeness, comparability, completeness, and sensitivity. DQIs should be defined for each sample matrix (e.g., air, building material, water, soil) and analytical parameter/group (e.g., lead, radon, asbestos, E. coli).

* Precision – The measure of agreement among repeated measurements of the same property under identical or substantially similar conditions, often evaluated by collecting and analyzing duplicate samples. For example, when two samples (a primary sample and a duplicate sample) are collected at the same time, from the same location, by the same person, using the same collection procedures, then the analytical results of those two samples should be comparable.
* Accuracy – A measure of the overall agreement of a measurement to a known value, often evaluated using samples spiked with known concentrations of an analytical parameter. For example, the analytical laboratory will spike a sample with a known concentration of an analyte and then analyze the sample to ensure the analytical instrument can detect the analyte at the spiked concentration.
* Bias – The systematic or persistent distortion of a measurement process that causes errors in one direction (i.e., the expected sample measurement is different from the sample’s true value).
* Representativeness – The degree to which environmental data accurately and precisely represent a characteristic of a population or environmental condition.
* Comparability – The measure of confidence that one dataset can be compared to another dataset.
* Completeness – A measure of the amount of valid environmental data needed to be obtained from a measurement system, often expressed as a percentage; the amount of valid information/data is compared to the amount of information/data that was planned under normal conditions.
* Sensitivity – The capability of a method or instrument to detect contaminant concentrations at or below the action level.

This section of the QAPP should describe how each DQI will be evaluated.

The table below is for illustration only and should not be construed as guidance for establishing performance or acceptance criteria. The table is an example of how DQIs may be presented for field and laboratory measurements.

|  |  |  |
| --- | --- | --- |
| **Data Quality Indicators (DQIs)** | **Quality Control (QC) Activities**  **and Checks** | **DQI goals** |
| Precision | Field and laboratory replicates | ≤20% relative percent deviation(RPD) or relative standard deviation (RSD) |
| Bias | Pre- and post-calibration, blanks, sample spikes | Data are not biased in a particular direction |
| Accuracy | Calibration standards, blanks, control samples | No blanks contaminated and all calibrations within acceptable limits (or acceptance criteria); percent recovery (%R) is 80-120% |
| Representativeness | Evaluate whether the data accurately represents the system, population, place, time, and/or situation of interest | Data collected represent the system characterized or exposure experienced and are not biased |
| Comparability | Compare to existing data or datasets | Data collected are sufficiently similar in methodology to permit a meaningful analysis |
| Completeness | Compare to intended sampling goals to meet the project purpose | Could be stated as the total number of samples or a percentage (e.g., 95%) of samples collected, or an identification of the critical samples needed for the project purpose |
| Sensitivity | Compare to reporting or detection limits from existing data or for decision-making | State the sensitivity needed for the instruments, methods, or processes used for the project to obtain meaningful data. This depends on the analytical method, but generally, the reporting or detection limits should be 3 to 5 times lower than an action level. |

Projects involving conducting surveys:

Describe the procedures that will be followed throughout the information gathering process to ensure the collected information is reliable, accurate, and meets the project objectives. Consider the following when determining DQIs for projects involving surveys:

* Determine the number of survey results needed to answer the study questions in Step #2.
* Are all questions in the survey required or are some of the questions optional?
* Are the surveys complete (i.e., all required survey questions were answered)?
* If asking open-ended questions, are they legible?
* If asking open-ended questions, can the responses be easily assessed using mathematical or statistical procedures (e.g., 32% of high school students recycle at home, 59% of residents believe air quality is the primary environmental issue in their community, etc)?
* Are the responses free from bias or influence?
* If conducting surveys by phone or in-person, did the interviewers ask only pre-approved survey questions?

Projects involving the use of existing data/information:

Describe the acceptable level of uncertainty in the compiled dataset. In other words, is there sufficient evidence in the existing data/information set to answer the study questions in Step #2, and what is the likelihood of errors? Consider the parameters that will be used to make estimates, such as calculating means and medians in order to characterize an average. This is relevant when the existing data/information will be used to make conclusions (e.g., estimating the number of people exposed to a contaminant, estimating the number of feet the glaciers have retreated in Grand Teton National Park).

Using the example project of measuring glacial retreat in Grand Teton National Park with photographs, consider how each photograph will be used to estimate the number of feet the glaciers have retreated. If glaciers will be measured by overlaying one photo over another, then each photo should be the same size and scale. If photos are not the same size and scale, what is the level of uncertainty associated with measuring glaciers by adjusting the scale and overlaying one photo over another, and is the level of uncertainty acceptable for estimating glacial retreat?

Consider the possible consequences associated with high levels of uncertainty and balancing this with available resources and other constraints you may encounter. For example, if photos are not the same size and scale, will an alternate method be used to estimate glacial retreat, such as taking measurements with a ruler or comparing glacier size to other notable landmarks?

**Step 7: Develop the Plan for Obtaining Data**

Briefly describe the plan for obtaining the environmental information/data. Note that the plan will be described in detail in Sections B, C, and D of the QAPP, so it is appropriate to only include a brief description of the plan here. However, this section should include references to the specific sections of the QAPP where the detailed plan information can be found. For example, the project schedule can be found in Section A5. Sample locations, sample matrix, analytical parameters, and sample rationale can be found in Section B1. Field quality control (QC) requirements can be found in Section B2.a, and so on.

**Tips and Other Information:**

For more information and guidance about the systematic planning process to develop quality objectives, please refer to EPA QA/G-4, Guidance on Systematic Planning Using the Data Quality Objectives Process, February 2006, which can be found at:

[https://www.epa.gov/quality/quality-program-directives](https://www.epa.gov/quality/quality-program-directives%20%20)

For more information about linking assistance agreements to environmental results, please visit the following website:

<https://www.epa.gov/grants/linking-assistance-agreements-environmental-results>

# A7. Distribution List

**Instructions:**

In the table provided in the QAPP template, list the individuals and their organizations who need copies of the approved QAPP and any subsequent revisions, including all persons responsible for implementing the project (e.g., project managers, field team leader, data manager, etc.), quality assurance (QA) officers, and representatives of all groups involved. Note that paper copies need not be provided to individuals if equivalent electronic copies can be provided.

Describe how the approved QAPP and all revisions will be maintained on file and made available upon request.

**Tips and Other Information:**

The table below includes an example of how to complete this section.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Title** | **Organization** | **Phone Number and Email Address** |
| Jane Smith | Operations Manager | XYZ Company | jane.smith@xyzcompany.moc  (303) 765-4321 |
| John Doe | QA Manager | XYZ Company | john.doe@xyzcompany.moc  (303) 123-4567 |

# A8. Project Organization

**Instructions:**

In the table provided in the QAPP template, list the individuals or organizations participating in the project and discuss their specific roles and responsibilities. Include the principal data users, decision makers, QA officers/managers, partnering organizations, and all other persons responsible for project implementation (i.e., individuals performing tasks described throughout the QAPP). Identify the individuals responsible for QAPP approval (see Section A2). Identify the individual responsible for maintaining the official approved QAPP.

**Tips and Other Information:**

The table below includes an example of how to complete this section.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Title** | **Organization** | **Responsibilities** |
| Jane Smith | Operations Manager | XYZ Company | Responsible for maintaining the official approved QAPP and any subsequent addendums and revisions. Responsible for keeping the EPA Project Officer informed on project schedule and milestones, managing daily activities, coordinating laboratory services, and implementing the sampling design. Reviews field notes and reports for deviations from the QAPP and initiates corrective action. |
| John Doe | QA Manager | XYZ Company | Independent of all data/information collection activities. Responsible for reviewing the QAPP annually and ensuring the QAPP reflects the project objectives and implementation. Also responsible for resolving any QA-related issues. |

# A9. Project Quality Assurance Manager Independence

**Instructions:**

Describe how you will ensure that the organization’s QAM is independent of environmental information operations.

**Tips and Other Information:**

The roles of the QAM and Operations Manager must remain independent of each other. In small organizations, it is possible that these two roles may be combined with approval of the EPA Regional QA Manager (RQAM). Please reach out to the EPA Project Officer if it is necessary to combine the QAM and Operations Manager roles. The EPA Project Officer will communicate with the RQAM to consider the request.

# A10. Project Organization Chart and Communications

**Instructions:**

Project Organization Chart

Provide a concise project organization chart showing reporting relationships and lines of communication among all project participants. If applicable, include partnering organizations and subcontractor relationships relevant to environmental information operations, such as laboratories providing analytical testing services.

The QAPP template includes an example project organization chart that must be updated for your specific project. Each box should include the name of the organization, name of the individual, and the individual’s title/role.

Note that all QA personnel must be independent of all environmental information operations/data collection activities, as shown with lines of communication (i.e., dashed lines), rather than lines of reporting (i.e., solid lines).

Project Communication Procedures

For each communication driver, describe communication procedures, including the pathway for the communication (e.g., phone or email) and the timeframe for notification (e.g., within 24 hours, within 3 business days, etc.). Provide sufficient detail to ensure QAPP users understand the processes when communication is necessary.

Communication drivers are those activities or issues that trigger communication between different responsible entities. Examples of communication drivers include, but may not be limited to, the following:

* Approval of amendments to the QAPP
* Notification and approval of real-time modifications to the QAPP
* Notifications of delays or changes to field work
* Recommendation to stop work due to health and safety issues
* Reporting issues related to data quality
* Project status updates to the EPA Project Officer

The QAPP Template includes a table that may be used to present project communications. You may also delete the table and describe communication procedures in paragraph format.

**Tips and Other Information:**

Make sure individual names and titles/roles are consistent between different sections of the QAPP. For example, names and titles should be consistent between QAPP Sections A2, A7, A8, and A10.

# A11. Personnel Training/Certification

**Instructions:**

Identify and describe any specialized training or certifications needed by personnel in order to successfully complete the project or task. Discuss how such training will be provided and how the necessary skills will be assured and documented.

**Tips and Other Information:**

The table below includes an example of how to complete this section.

|  |  |  |
| --- | --- | --- |
| **Role** | **Specialized Training/Certification** | **How training will be provided and documented** |
| Field Team Leader | CPR/First Aid Certification | Training provided by the American Red Cross. Certification is valid for 2 years, and training will be scheduled by the Health and Safety Officer. The certificate will be provided to the employee, and a copy of the certificate will be provided to the Health and Safety Officer and maintained in the employee file. |
| Commercial Laboratory | Current National Environmental Laboratory Accreditation Conference (NELAC) certification | Texas Commission on Environmental Quality (TCEQ) is the accrediting body. Certification is renewed annually, and onsite assessments are conducted every 2 years by TCEQ’s assessment contractor. The certificate will be provided to the laboratory QA Manager by TCEQ and will be maintained by the laboratory QA Manager. |
| Survey Technician | * Proficient using the survey application software on a tablet * Fluent in Spanish | * Survey training will be provided by the Operations Manager, and Survey Technicians will be given time to practice using software on the tablets. The Operations Manager will determine the achieved level of proficiency. * Spanish speaking ability will be demonstrated at the start of the project and verified by the Operations Manager. |
| Existing Data/Information Technician | Handling Personally Identifiable Information (PII) | PII training is provided annually by the Human Resources Manager. The Human Resources Manager documents training attendance, and a certificate of completion is maintained in the employee file. |

# A12. Documents and Records

**Instructions:**

Describe the documents and records that will be generated during this project.

* Describe the process and responsibilities for ensuring the appropriate project personnel have the most current approved version of the QAPP, including version control, updates, distribution, and disposition.
* Identify any records and documents applicable to the project that will be produced.
* Specify the reporting format for any hardcopy and electronic forms.
* Specify or reference all applicable requirements for the storage of records and documents (i.e., location where records and documents will be maintained, as well as any security requirements).
* Describe or reference the requirements for the final disposition of records and documents. For example, after the required record and document retention period is over, will documents and records be offered to the EPA, shredded, etc.?

**Tips and Other Information:**

The QAPP template includes a list of potential documents that may be produced during the project. The documents listed should be modified to represent the documents that will be generated during your specific project.

The documents listed in the QAPP template may be used as subheadings in this section. Each subheading should include the information listed above in the instructions.

# B1. Identification of Project Environmental Information Operations

**Instructions:**

Provide a detailed description of how the environmental information operations will be conducted to accomplish the project purpose.

Projects involving sample collection and analysis

For projects that include the collection of field samples, fill out the table provided in the QAPP template with the following information:

* **Sampling Location** – Describe the location(s) where the sample should be collected.
* **Sample ID Number** – Identify each sample with a unique sample ID number. The sample ID numbers will be used on the chain-of-custody form and sample label to uniquely identify each sample. Rather than just numbering samples as 1, 2, 3, etc., it is recommended that additional identifying information be included in the sample ID numbers, such as location ID, sample matrix code, quality control (QC) sample code, and/or date the sample is collected (refer to footnote 1 below the table under Tips and Other Information for an example).
* **Sample Matrix** – Describe the type of sample to be collected, such as soil, groundwater, indoor air, etc.
* **Analytical Parameter** – Describe the analytical parameter(s) that the sample will be analyzed for, such as asbestos, radon, lead, pesticides, etc.
* **Sampling SOP** – Identify the SOP(s) that field personnel must follow while collecting each sample. Note that detailed sampling SOPs must be available to field personnel and should be included as an appendix to the QAPP. If detailed sampling SOPs are not available, then the procedures must be described in detail in Section B2.a of the QAPP.
* **Rationale** – Briefly describe the reason each specific sampling location was selected.
* **Comments** – The comments field can be used to document any reminders for field personnel, such as taking photographs and GPS coordinates.

In some cases, you may not know the exact sampling locations and sample ID numbers prior to the sample collection event. If this is the case for your project, follow the instructions below when completing this section of the QAPP template:

* Delete the table from the QAPP template.
* Describe how sample locations will be determined in the field (i.e., what is the criteria for determining when and where a sample should be collected).
* Describe how sample locations will be documented (e.g., photographs, GPS coordinates, markings on a map, etc.).
* Describe the sample numbering convention for uniquely identifying each sample, including field QC samples. For an example, refer to the Sample ID Number instructions above and footnote 1 below the table under Tips and Other Information.
* Describe the type of sample that will be collected from each sample location (e.g., soil, groundwater, air, etc.) and the analytical parameter (e.g., asbestos, lead, radon, etc.).
* Identify the SOP(s) that field personnel must follow while collecting each sample. Note that detailed sampling SOPs must be available to field personnel and should be included as an appendix to the QAPP. If detailed sampling SOPs are not available, then the procedures must be described in detail in Section B2.a of the QAPP.

Projects involving conducting surveys

Delete or modify the table in the QAPP Template to suit your project-specific needs, and describe the following:

* List of survey questions
* How much data is needed (important if surveys are incomplete)
* How will survey participants be selected (e.g., if survey participants will be selected randomly, the QAPP should describe the randomizing process)
* How the survey will be administered (e.g., online format, in-person, phone, etc.)
* Timing for survey completion (e.g., completed surveys must be returned within 30 calendar days)
* How data will be organized
* How data will be compiled

Projects involving the use of existing data/information

Delete or modify the table in the QAPP Template to suit your project-specific needs, and describe the following:

* How sources of existing data/information were selected and the type of data from each source
* How much data/information is needed from each source
* How data/information will be organized
* How data/information will be compiled

**Tips and Other Information:**

If you are filling out the table in the QAPP template, refer to the table below for an example of the type of information to record in each table column.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample Location** | **Sample ID**  **Number1** | **Sample**  **Matrix** | **Analytical Parameter/**  **Group** | **Sampling**  **SOP** | **Rationale** | **Comments** |
| Center of Room 123 | 123-CT-ASB-20240201-01 | Ceiling Tile | Asbestos | SOP #456 | Determine asbestos concentration in Room 123 ceiling tile |  |
| Center of Room 123 | 123-CT-ASB-20240201-01-FD | Ceiling Tile | Asbestos | SOP #456 | Duplicate of sample 123-CT-ASB-20240201-01 |  |

1 Sample numbering convention: location ID - sample matrix code - analytical parameter code - sample collection date - sequential number - QC sample code (if applicable). For example:

123-CT-ASB-20240201-01-FD, where:

123 = Room number

CT = ceiling tile

ASB = asbestos

20240201 = February 1, 2024

01 = sequential number

FD = field duplicate

# B2. Methods for Environmental Information Acquisition

## Subsection B2.a – Field Activities Environmental Measurements, Observations, and Surveys

**Instructions:**

* Describe the procedures for collecting samples, environmental measurements, observations, and surveys. Identify any sampling methods and equipment/materials needed. Where appropriate, identify sampling methods by number, date, and regulatory citation.
* Discuss what to do if a sample, environmental measurement, observation, or survey cannot be collected for any reason (e.g., groundwater well is dry, property access is denied, sampling equipment failure, survey incomplete or not returned, etc.).
* Describe the process for the preparation and decontamination of sampling equipment, including the disposal of decontamination by-products and disposable materials (e.g., disposable gloves, paper towels, etc.), to prevent cross-contamination between samples.
* For each analytical parameter/group and sample matrix, fill out the table in the QAPP template with the method and SOP reference, laboratory accreditation expiration date (see Laboratory Analysis in Subsection B2.b), required sample containers, preservation requirements, and maximum holding times from sample collection to extraction/analysis.
* Provide complete laboratory contact information, including the physical address where samples should be delivered and point of contact name, phone number, and email address.
* List any required accreditations or certifications that should be held by the laboratory. For example, a project with asbestos analysis may require NVLAP (National Voluntary Laboratory Accreditation Program) accreditation, and a project with chemical analysis may require NELAC (National Environmental Laboratory Accreditation Conference) accreditation.
* Specify the laboratory data package turnaround time required for the project. Data package turnaround time is the number of days from when samples are received by the laboratory until sample results are provided to the project team (e.g., 21 calendar days or 15 business days).
* For surveys, describe how the survey will be administered (e.g., by mail, on-line, in-person, etc.), and provide the complete list of questions that will be asked of survey participants. Describe any additional requirements for completing the surveys (e.g., internet access for online surveys).

**Tips and Other Information:**

The items listed in the QAPP template (i.e., Sampling Methods, Field/Sampling Equipment and Materials, and Decontamination) may be used as subheadings in this section, as applicable, or revised for your specific project.

For the Sample Container, Volume, Preservation, and Holding Time Requirements table, request this information from the analytical laboratory selected to analyze the samples. Delete the table from the QAPP template if this information is not applicable to your project.

SOPs

An SOP is a set of step-by-step instructions that help workers carry out routine tasks. SOPs improve efficiency, quality, and uniformity, while reducing miscommunication and the risk of errors. SOPs should include the following information:

* Title Page – title of the activity or procedure, identification number, date of issue or revision, name of the organization to which the SOP applies, approval signatures and dates
* List of equipment and materials needed to complete all tasks described in the SOP
* Roles and responsibilities of individuals performing each task
* Regulatory information or standards, if applicable
* Health and safety considerations
* Quality control requirements
* A description of each step of the process in sequential order
* References

Note that EPA has SOPs that may be used for your project, if applicable. They can be found at:

<https://response.epa.gov/site/site_profile.aspx?site_id=2107>

For additional information on SOP development, refer to the current version of EPA QA/G-6, Guidance for Preparing Standard Operating Procedures, April 2007, which can be found at:

<https://www.epa.gov/quality/quality-program-directives>

**B2. Methods for Environmental Information Acquisition (cont.)**

## Subsection B2.b – Laboratory Analysis

**Instructions:**

This section of the QAPP is used to ensure that the selected analytical methods are capable of meeting the project-specific data quality objectives (see Section A6).

* In the Analyte column, you must list each specific analyte you are requesting results for. For example, if you are requesting that soil samples be analyzed for metals, you must list each specific metals compound for which you want results (e.g., arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, etc.).
* List the analytical method that will be used to analyze each analyte.
* In the Units column, indicate the unit of measure for the project action level and laboratory-specific limits.
* List the project action level for each analyte. The action level is the concentration of a contaminant (e.g., lead, radon, asbestos) that when exceeded is considered harmful or toxic to human health or the environment.
* List the source of each project action level. For example, the project action level source may be the current EPA Regional Screening Levels or other Federal or State regulatory program.
* List the laboratory-specific reporting limit. The reporting limit is the smallest concentration of an analyte/compound that can be reported by a laboratory. Note that when selecting an analytical method and laboratory, the laboratory-specific reporting limit should be lower than the project action level to ensure method sensitivity and meet project goals. If the laboratory-specific reporting limit is greater than the project action level, then a different analytical method or laboratory may need to be selected.

**Tips and Other Information:**

Request the laboratory-specific reporting limits from the analytical laboratory. Be sure to indicate the required units for the laboratory-specific reporting limits, as well as the analytical results. For example, if the project action level unit is listed as milligrams per kilogram (mg/kg), you want to make sure the laboratory-specific reporting limit and the analytical result are also in mg/kg so they can be easily and quickly compared to the project action level without having to make conversions.

**B2. Methods for Environmental Information Acquisition (cont.)**

## Subsection B2.c – Existing Information

For projects involving the use of existing data/information, describe the following:

* The data/information to be collected
* The collection process
* The intended use of that data/information
* The criteria that will be used to determine that the data/information is acceptable for your project
* If the data/information will be combined with new environmental data/information, the criteria to ensure compatibility

**Tips and Other Information:**

Existing data/information includes information compiled or obtained from databases, software applications, decision support tools, websites, existing literature, and other sources. In other words, it is data/information that was generated for purposes other than your specific project or data pertinent to your project but generated under a separate QAPP.

The project team should carefully evaluate the quality of the existing data/information to ensure it is of the type and quality necessary to support its intended use.

Some examples of existing data/information include the following:

* Sampling and testing data collected during previous investigations
* Historical data
* Background information
* Previously conducted interviews
* Modeling data
* Photographs
* Aerial photographs
* Topographic maps
* Published literature, reports, and handbooks
* Data/information from state and local monitoring programs
* Data/information from publicly available databases, such as data from the U.S. Census Bureau

**B2. Methods for Environmental Information Acquisition (cont.)**

## Subsection B2.d – Environmental Technology

For projects involving environmental technology, describe the following:

* Identify whether the technology is primarily for pollution prevention, contamination containment, storage, or remediation
* Physical parameters or processes collected using environmental technologies
* Specific systems, devices, and their components applicable to both hardware and methods or techniques that measure or remove pollutants or contaminants or prevent them from entering the environment

**Tips and Other Information:**

Below are examples of environmental technology:

* Pollution prevention – measurement, monitoring, reduction, control, or treatment processes, such as wet scrubbers (air), granulated activated carbon unit (water), and filtration (air, water)
* Contamination containment – containment to prevent further movement of the contaminants, such as capping, solidification or vitrification, and biological treatment
* Storage – storage containers, methods, or facilities, such as drums, tanks, ponds, or lagoons
* Remediation – remediation processes and their components, such as contaminant removal and replacement with backfill, soil washing (soil), pump and treat systems, soil vapor extraction (soil), land farming, and other bioremediation processes

For additional advice on QAPPs for the design, construction, and operation or application of environmental technology, please refer to EPA QA/G-11, Guidance on Quality Assurance for Environmental Technology Design, Construction, and Operation, January 2005, which can be found at:

<https://www.epa.gov/quality/quality-program-directives>

# B3. Integrity of Environmental Information

**Instructions:**

Describe the procedures for ensuring the integrity of the environmental information operations.

For projects involving the collection and analysis of samples, describe the requirements for sampling handling and custody in the field, during transport, and at the laboratory.

**Sampling Organization** – Identify the name of the organization responsible for collecting the samples.

**Laboratory name and address** – Identify the name of the laboratory performing sample analysis. Provide the physical address where samples should be delivered.

**Method of sample delivery** – Indicate the method of sample delivery to the laboratory, such as FedEx, local courier service, or hand-delivery.

**Number of days from reporting until sample disposal** – This is the number of days that samples, including extracts, should be stored at the laboratory after analysis is complete and results have been reported until they can be disposed of.

Complete the Sample Handling System table in the QAPP template with the organization and title of the person responsible for completing each activity, as well as the SOP reference where the specific sample handling procedures can be found. Note that the information needed to complete the Sample Receipt and Analysis section of the table can be requested from the laboratory.

Note that detailed sample handling SOPs must be available to field personnel and should be included as an appendix to the QAPP. If SOPs have not been developed and are not available, then procedures must be described in detail in this section of the QAPP for each listed activity.

For projects involving the use of existing data/information or surveys, describe how the collected data/information will be managed to ensure its integrity. For example, will the data/information be stored in a secure database with limited access? How will data/information be transferred or shared between sources or individuals, and how will it be ensured that no data/information is lost during the transfer or sharing process? If surveys are anonymous, describe how anonymity is ensured.

**Tips and Other Information:**

When deciding on the method of sample delivery, consider the nature of the samples, maximum allowable sample holding time from collection to extraction/analysis, available shipping options, and the project schedule. For example, if an analytical method requires a short holding time (e.g., samples must be analyzed within 48 hours of sample collection) or if samples must be maintained at a certain temperature (e.g., 6°C or less), then samples may need to be hand-delivered to the laboratory on the same day as sample collection or shipped to the laboratory overnight (e.g., via FedEx).

When determining the number of days from reporting until sample disposal, consider the amount of time from sample delivery until the laboratory reports the analytical results, data have been verified and validated, and data usability has been determined in case a sample must be reanalyzed.

Examples of sample labels and chain-of-custody forms should be included as a QAPP appendix.

# 

# B4. Quality Control

Note that this section is only applicable for projects involving direct measurements (e.g., sample collection and analysis, field observations).

**Instructions:**

Quality control (QC) samples are used to verify that samples were not contaminated during sample collection or analysis. They are also used to assess the accuracy and precision of analytical methods used for detection.

Use the table in the QAPP template to identify QC activities needed for each sampling, analysis, or measurement technique. For each required QC activity, list the associated method or procedure, acceptance criteria, and corrective action plan.

**Tips and Other Information:**

Based on your project-specific needs, the types of QC samples listed in the QAPP template may need to be revised.

Ask the analytical laboratory what QC samples will be analyzed for each method and matrix. Ask the laboratory to provide the frequency/number of QC samples needed, QC acceptance limits, corrective action, and person responsible for the corrective action.

A separate table should be filled out for each sample matrix, analytical parameter, and method.

Below is an example of the type of information that may be included in the table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample Matrix** | Soil | | | | |
| **Field Sampling SOP** | SOP XYZ | | | | |
| **Analytical Parameter** | Metals | | | | |
| **Analytical Method/ Laboratory SOP** | Metals by SW846 Method 6020B/SOP LAB-54321 | | | | |
| **QC Sample** | **Frequency/ Number** | **QC Acceptance Limits** | **Corrective Action** | **Person Responsible for Corrective Action** | **Data Quality Indicator** |
| Field Duplicate | 1 per 10 field samples | Relative percent difference (RPD) <50% | Qualify data as needed | Analyst/laboratory manager | Precision - overall |
| Method Blank | 1 per preparatory batch | No target analytes ≥ laboratory reporting limit | Reanalyze samples; qualify data as needed | Analyst/laboratory manager | Accuracy/bias |
| Laboratory Control Sample | 1 per preparatory batch | Laboratory in-house control limits | Reanalyze once; qualify data as needed | Analyst/laboratory manager | Accuracy/bias |
| Laboratory Matrix Spike/ Matrix Spike Duplicate | 1 per preparatory batch | Laboratory in-house control limits | If laboratory error is suspected, reprepare and reanalyze the native sample and matrix spike/matrix spike duplicate. Otherwise, evaluate matrix effects on data quality. | Analyst/laboratory manager | Accuracy/bias  Precision |

Corrective actions are actions you take to fix conditions that may have caused exceedances of acceptance criteria, such as contamination in a sampling bottle or a poor instrument calibration. Examples of corrective actions include the following: additional training for personnel, inspect the instruments, recalibrate the equipment, re-analyze samples, or flag the sample results.

# B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance

Note that this section is only applicable for projects involving direct measurements (e.g., sample collection and analysis, field observations).

**Instructions:**

Field sampling equipment and laboratory analytical instruments should be calibrated, tested, inspected, and maintained in accordance with manufacturer’s instructions and the requirements stated in the applicable SOPs.

Calibration, testing, inspection, and maintenance of field equipment should be described in dedicated field logbooks. Calibration, testing, inspection, and maintenance of analytical instruments should be described in the analytical data package.

Use the table in the QAPP template to:

* Identify all tools, gauges, instruments, and other sampling, measuring, and testing equipment used for data generation or collection activities that must be calibrated to maintain performance within specified limits
* Identify all equipment and instrumentation that requires testing, inspection, and maintenance
* Describe the procedures for each calibration activity
* Describe the testing, inspection, and maintenance activities
* Indicate the required frequency for each calibration, testing, inspection, and maintenance activity
* Indicate the acceptance criteria for each calibration, testing, inspection, and maintenance activity
* Describe the corrective action plan for any calibration, testing, inspection, and maintenance deficiency
* Reference the applicable SOP that describes the calibration, testing, inspection, and maintenance activities in detail
* Identify the person responsible for the calibration, testing, inspection, and maintenance activities

**Tips and Other Information:**

Examples of field equipment that may be used for a project include GPS units, water quality meters, air samplers, and digital cameras, including cell phone and tablet cameras.

For laboratory instruments, ask the laboratory to provide the required information.

# B6. Inspection/Acceptance of Supplies and Services

**Instructions:**

* Describe the process for inspecting supplies and consumables and determining their acceptability for use during the project.
* State acceptance criteria for such supplies and consumables.
* Indicate the required frequency for inspecting supplies and consumables.
* Identify the person responsible for performing inspections of supplies and consumables.
* Describe how supplies and consumables should be handled and stored.

**Tips and Other Information:**

Examples of supplies and consumables that may be used during a project include sample containers, disposable gloves, waterproof markers, spare batteries, bug repellant, sunscreen, flashlights, safety glasses, cell phones, waste containers, duct tape, and computer hardware and software.

# B7. Environmental Information Management

**Instructions:**

* Describe the data management processes that will be used throughout the life of the project, tracing the path of the data from their generation to their final use or storage (e.g., the field, the office, the laboratory).
* Describe or reference the standard record-keeping procedures, document control system, and the approach used for data storage and retrieval on electronic media.
* Describe the process for detecting and correcting errors and for preventing loss of data during data reduction, data reporting, and data entry to forms, reports, and databases.
* Include any required computer hardware and software that will be used and address any specific performance requirements for the hardware/software configuration used.
* Provide examples of any forms or checklists to be used.
* Identify the individual(s) responsible for data management.

**Tips and Other Information:**

Be sure to reference any SOPs you have for record keeping, document control, or storage and retrieval of data, and include them in a QAPP appendix.

When completing this section of the QAPP, consider the following questions, as applicable:

* How will all data be recorded?
* Will data be transcribed from datasheets to an online database?
* What percent of data will be checked for accuracy and transcription errors?
* Who will check for discrepancies in data entries and how?
* How will laboratory results be delivered and by whom?
* How will data that did not meet the QC requirements of the laboratory be qualified?
* Will data be entered into an electronic database? By whom?
* If applicable, will electronic files be backed up daily?
* How will original data be stored and for how long?
* How will you ensure access to data by appropriate parties in various stages of processing?
* Will data be generated by hand (such as in the field), collected from literature or other sources (existing data), from computerized equipment or instruments and/or computer generated (such as in the laboratory or during review of the data)?
* Will you need any minimum performance or acceptability requirements for sources of data (such as computer hardware or software)?
* Will security or confidentiality specifications be incorporated into the project’s data management system, such as password protections or limited access by authorized personnel only?

# C1. Assessments and Response Actions

**Instructions:**

An assessment is a process used to evaluate the performance or effectiveness of a system and its elements. Types of assessments may include audits, performance evaluations, management reviews, peer reviews, inspections, surveillance, and product reviews.

Use the table in the QAPP template to document responsibilities for conducting project assessments, responding to assessment findings, and implementing corrective action. Appropriately scheduled assessments allow management to implement corrective action in a timely manner, thereby correcting deviations, errors, and nonconformances and minimizing their impact on project data quality objectives.

Include any assessment SOPs and checklists as a QAPP appendix.

Assessments involving existing data/information generally address the process of acquiring, evaluating, selecting, and obtaining existing data/information for use on the project. For projects involving the use of existing data/information, consider the following:

* Existing data/information meet basic project specifications (e.g., data/information are of the proper type) and are appropriately relevant and suitable for their targeted use (e.g., data/information have an acceptable target population)
* The quality of existing data/information meet the acceptance criteria specified in QAPP Section A6 and a sufficient quantity of existing data/information is available to allow the project to meet criteria on data quality
* Proper procedures and protocols were used in obtaining or abstracting existing data/information from their sources
* Sufficient metadata was obtained on the data/information
* Checks to ensure the complete existing data/information set was imported properly from the existing data/information source
* Potential corrective actions may include collecting additional data/information or investigating other data/information sources

**Tips and Other Information:**

The table below includes an example of the types of assessments that may be conducted throughout the project.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Type** | **Responsible for Conducting Assessment** | **Number/ Frequency** | **Estimated Dates** | **Assessment Deliverable** | **Deliverable Due Date** | **Responsible for Responding to Assessment Findings** | **Timeframe for Response** | **Responsible for Implementing Corrective Action** | **Responsible for Monitoring Corrective Action Effectiveness** |
| Readiness review | Organization QA Manager | Once | One week prior to field sampling | Readiness review memo and checklist | 24 hours following assessment | Organization Operations Manager | 24 hours following receipt of memo and checklist | Organization Operations Manager | Organization QA Manager |
| Field sampling assessment | Organization Operations Manager | Once on the first day of sampling | [fill in planned dates] | Field sampling assessment memo and checklist | 24 hours following assessment | Organization Field Team Leader | 24 hours following receipt of memo and checklist | Organization Field Team Leader | Organization QA Manager |
| Existing data/ information review | Organization QA Manager | Once for each data source | Following data collection from each data source | Existing data review memo | Within 3 business days of assessment completion | Organization Operations Manager | Within 3 business days of assessment completion | Organization Operations Manager | Organization QA Manager |
| Data entry peer level review | To be assigned by the Organization Operations Manager | Weekly | Every Friday during data entry into the project database | List of data entry errors | Same day of the data entry peer level review | Individual who performed the original data entry | 24 hours following the receipt of the list of data entry errors | Individual who performed the original data entry | Individual assigned to perform the data entry peer level review |

# C2. Oversight and Reports to Management

**Instructions:**

This section documents how management will be kept informed of project oversight and assessment activities and findings.

Use the table in the QAPP template to identify the type, frequency, and distribution of reports issued to inform management of the project status. Identify the preparer(s) and the recipient(s) of the reports.

**Tips and Other Information:**

Examples of reports that may be prepared include the following:

* Field reports
* Project status or progress reports
* Assessment reports (assessment memo and checklist and corrective action reports)
* Data verification reports
* Data validation reports
* Data usability report
* Final project report

# D1. Environmental Information Review

**Instructions:**

This section should describe the final checks that will be done on the data/information collected to decide whether they meet the project data quality objectives discussed in Section A6 and whether the data/information can be used for its intended purpose.

Describe the process to be used for verifying and validating data. Describe the data review process for ensuring that the data have been recorded, transmitted, and processed correctly (e.g., checking for data entry, transcription, and calculation errors). Discuss how issues will be resolved and the authorities for resolving them. Describe how the results are conveyed to data users. Identify any project-specific calculations required.

If data verification or validation checklists will be used, include the checklists in a QAPP appendix. If data verification or validation procedures are contained in an SOP or other document, the procedures should be referenced in this section and included as a QAPP appendix.

Data Verification

Describe the process for verifying that all required activities were conducted, all specific records are present, and the contents of the records are complete. Examples of records to be verified include field logbooks, chain-of-custody forms, laboratory reports, assessment memos/checklists/reports, corrective action reports, and project databases.

Data Validation

Describe the procedures that will be used to validate project data/information.

Data validation is an analyte-specific, sample-specific, and data point-specific process for evaluating compliance with grant/contract/interagency agreement requirements, methods/SOPs, and quality control acceptance criteria to determine the quality of a specific dataset relative to the intended end use. It focuses on the project’s specifications or needs, is designed to meet the needs of the decision makers/data users and should note potentially unacceptable departures from the QAPP.

Note: Should formal data validation be performed, the data validator must be an individual(s) who is independent of all environmental information operations/data collection activities.

Describe the procedures that will be followed to determine whether individual data values within the dataset should be rejected, transformed, or qualified before any statistical analysis. All data qualifiers applied to the data by the data validator must be defined. Data validation should note when acceptance criteria are not met, but the final rejection of any data and their use is a decision reserved specifically for the project team.

If data/information will be entered into a project database, describe the features of the data management system that verify the accurate entry of values for important data parameters into the database, along with any data reduction procedures (e.g., averages of replicate measurements).

**Tips and Other Information:**

Below are examples of the type of information that may be included in this section:

Field documents and records will be reviewed by the Operations Manager for completeness and accuracy (e.g., checking for data entry, transcription, and calculation errors) as part of the final report preparation process.

Field data will be evaluated against the acceptance criteria discussed in Section A6 and the sampling process design described in Section B1.

The laboratory will evaluate analytical data in accordance with their Laboratory QA Manual (or equivalent document) and report results in the analytical data report. Issues identified during the laboratory review and any flags applied to the results by the laboratory will be described in the project narrative of each analytical data report.

Analytical results will be further evaluated by the Operations Manager with special attention to the quality control data results in accordance with Section B4.

Note: A data qualifier is a code or flag attached to a data point that alerts the data user to a specific issue or limitation regarding the data. The data qualifier provides context about the accuracy or reliability of the measured value (i.e., it acts as a note explaining why the data point might not be fully reliable). For example, an “R” qualifier might be used to indicate that a data point should be considered for rejection, or a “J” qualifier might be used to indicate that a data point represents an estimated value. All data qualifiers that may potentially be applied to a dataset must be defined in the QAPP.

# D2. Usability Determination

**Instructions:**

Describe how project results will be reconciled with the requirements defined in the data quality objectives (see Section A6). This is the process for determining data usability (i.e., determining whether the results meet, or do not meet, the project objectives and requirements defined in the QAPP). The data usability assessment (also referred to as the data quality assessment) is performed at the conclusion of information/data collection activities, using the outputs from data verification and data validation.

**Tips and Other Information:**

The data usability assessment involves a qualitative and quantitative evaluation of the data to determine if the project data are of the right type, quality, and quantity to support the decisions that need to be made. It involves a retrospective evaluation of the systematic planning process (i.e., data quality objectives described in Section A6), and, like the systematic planning process, involves participation by key members of the project team, who should be identified in this section. The data usability assessment evaluates whether underlying assumptions used during systematic planning are supported, sources of uncertainty have been accounted for and are acceptable, data/information are representative of the population of interest, and the results can be used as intended, with the acceptable level of confidence. The data usability assessment should discuss how limitations on the use of the data will be reported to decision makers.

The data usability report should be included as part of the final project report, along with any supporting information.

For additional guidance on conducting a data usability assessment, please see EPA QA/G-9, Guidance for Data Quality Assessment: Practical Methods for Data Analysis, July 2000 and EPA QA/G-9R, Data Quality Assessment: A Reviewer’s Guide, February 2006, both of which can be found at:

<https://www.epa.gov/quality/quality-program-directives>

# References

**Instructions:**

The references already listed in this section of the QAPP template were used to prepare the template and should not be deleted.

Add resources used to complete your project-specific QAPP. References should include the author, title, document/volume/revision numbers, and date of the referenced document. If a website was used as a reference, include the title of the article or website and the specific URL.

**Tips and Other Information:**

At a minimum, add your project narrative/workplan (or equivalent document) to the list of references.

**ATTACHMENT 1**

**QUALITY ASSURANCE PROJECT PLAN TEMPLATE USING THE GRADED APPROACH**

**U.S. Environmental Protection Agency Region 8**

Organization Name

Organization Address

**Quality Assurance Project Plan (QAPP) for**

**Project Title**

Grant/Contract/Interagency Agreement Number

Date of the QAPP

QAPP Revision Number

# A1. Title Page

**Quality Assurance Project Plan for**

**Project Title:**

**QAPP Preparation Date:**

**Organization Conducting**

**Environmental Information Operations:**

**Organization that Developed the QAPP:**

(if different from organization

conducting the work)

**Period of Applicability:** Up to 5 years from the date of the EPA Regional Quality Assurance Manager or Delegated Approving Official approval.

**Revision Number:**

**Grant Number:**

# A2. Approval Page

**Organization Name Approvals:**

Quality Assurance Manager (QAM)

Printed Name:

Signature & Date:

Operations Manager:

Printed Name:

Signature & Date:

**EPA Approvals:**

EPA Region 8 Project Officer:

Printed Name:

Signature & Date:

EPA Regional Quality Assurance Manager (RQAM)

or Region 8 Delegated Approving Official (DAO):

Printed Name:

Signature & Date\*:

\*The effective date of this QAPP is the date the EPA Region 8 RQAM or DAO signs the QAPP.

# A3. Table of Contents

[A1. Title Page 2](#_Toc181085425)

[A2. Approval Page 3](#_Toc181085426)

[A3. Table of Contents 4](#_Toc181085427)

[Acronyms 5](#_Toc181085428)

[A4. Project Purpose, Problem Definition, and Background 6](#_Toc181085429)

[A5. Project Task Description 7](#_Toc181085430)

[A6. Information/Data Quality Objectives and Performance/Acceptance Criteria 9](#_Toc181085431)

[A7. Distribution List 10](#_Toc181085432)

[A8. Project Organization 11](#_Toc181085433)

[A9. Project Quality Assurance Manager Independence 12](#_Toc181085434)

[A10. Project Organization Chartand Communications 13](#_Toc181085435)

[A11. Personnel Training/Certification 15](#_Toc181085436)

[A12. Documents and Records 16](#_Toc181085437)

[B1. Identification of Project Environmental Information Operations 17](#_Toc181085438)

[B2. Methods for Environmental Information Acquisition 18](#_Toc181085439)

[Subsection B2.a – Field Activities Environmental Measurements 18](#_Toc181085440)

[Subsection B2.b – Laboratory Analysis 20](#_Toc181085441)

[Subsection B2.c – Existing Information 21](#_Toc181085442)

[Subsection B2.d – Environmental Technology 22](#_Toc181085443)

[B3. Integrity of Environmental Information 23](#_Toc181085444)

[B4. Quality Control 24](#_Toc181085445)

[B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance 25](#_Toc181085446)

[B6. Inspection/Acceptance of Supplies and Services 26](#_Toc181085447)

[B7. Environmental Information Management 27](#_Toc181085448)

[C1. Assessments and Response Actions 28](#_Toc181085449)

[C2. Oversight and Reports to Management 29](#_Toc181085450)

[D1. Environmental Information Review 30](#_Toc181085451)

[D2. Usability Determination 31](#_Toc181085452)

[References 32](#_Toc181085453)

**List of Figures**

Figure 1 Project Organization Chart

**Appendices**

# Acronyms

DAO Delegated Approving Official

DCN Document Control Number

DQI Data Quality Indicator

DQO Data Quality Objective

EIO Environmental Information Operations

EPA U.S. Environmental Protection Agency

PAL Project Action Level

QA Quality Assurance

QAM Quality Assurance Manager

QAPP Quality Assurance Project Plan

QC Quality Control

RQAM Regional Quality Assurance Manager

SOP Standard Operating Procedure

# A4. Project Purpose, Problem Definition, and Background

# A5. Project Task Description

**Project Schedule Timeline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity** | **Date (MM/DD/YYYY)** | | **Deliverable/Document Generated** | **Deliverable/Document**  **Due Date** |
| **Anticipated Start Date** | **Anticipated End Date** |
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# A6. Information/Data Quality Objectives and Performance/Acceptance Criteria

**Step 1: State the Problem**

**Step 2: Identify the Goals of the Study**

**Step 3: Identify Information Inputs**

**Step 4: Define the Boundaries of the Study**

**Step 5: Develop the Analytic Approach**

**Step 6: Specify Performance or Acceptance Criteria**

**Step 7: Develop the Plan for Obtaining Data**

# A7. Distribution List

The following individuals will receive a copy of the approved QAPP and any subsequent revisions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Title** | **Organization** | **Phone Number and Email Address** |
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# A8. Project Organization

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| --- | --- | --- | --- |
| **Name** | **Title** | **Organization** | **Responsibilities** |
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# A9. Project Quality Assurance Manager Independence

# A10. Project Organization Chartand Communications

Figure 1 presents the key personnel participating in this project. Quality assurance (QA) personnel are independent of all environmental information operations, as shown by lines of communication, rather than lines of reporting.

**Figure 1 Project Organization Chart**

Individual Name

EPA Region 8

Project Officer

Individual Name

EPA Region 8

RQAM or DAO

Partnering Organizations

Individual Name

Organization Name

QA Manager

Individual Name

Organization Name

Operations Manager

Individual Name

Organization Name

Field Team Lead

Individual Name

Organization Name

Data Validator

Individual Name

Organization Name

Data Manager

Organization Name

Field Staff

Subcontractors

**Legend**

Lines of reporting

Lines of communication

**A10. Project Organization Chart and Communications (cont.)**

**Project Communication Procedures**

|  |  |  |  |
| --- | --- | --- | --- |
| **Communication Driver** | **Send Communication to (Name and Organization)** | **Contact Information** | **Procedure (timing, pathway, documentation, etc.)** |
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# A11. Personnel Training/Certification

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| --- | --- | --- |
| **Role** | **Specialized Training/Certification** | **How training will be provided and documented** |
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# A12. Documents and Records

QAPP

Monthly Progress Reports

Sample Collection/Field Records

Analytical Records

Assessment Records

Corrective Action Reports

Data Verification and Validation Records

Data Usability Report

Final Project Report

Record and Document Retention Requirements

# B1. Identification of Project Environmental Information Operations

**Sampling Locations and Sampling Standard Operating Procedures (SOPs)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample**  **Location** | **Sample ID**  **Number** | **Sample**  **Matrix** | **Analytical Parameter/**  **Group** | **Sampling**  **SOP** | **Rationale** | **Comments** |
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# B2. Methods for Environmental Information Acquisition

## *Subsection B2.a – Field Activities Environmental Measurements, Observations and Surveys*

Sampling Methods

Field/Sampling Equipment and Materials

Decontamination

Laboratory (name, sample receipt address, point-of-contact, email, and phone number):

List any required accreditations/certifications:

**Sample Container, Volume, Preservation, and Holding Time Requirements**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Analytical Parameter/ Group** | **Analytical**  **Matrix** | **Method/SOP** | **Accreditation Expiration Date** | **Sample Container(s) (number, size, and type)** | **Preservation**  **(chemical, temperature, light protected)** | **Maximum Holding Time from Collection to Extraction/ Analysis** | **Data Package Turnaround Time** |
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**B2. Methods for Environmental Information Acquisition (cont.)**

## *Subsection B2.b – Laboratory Analysis*

**Contaminants of Concern and Other Target Analytes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Analyte** | **Sample Matrix** | **Analytical Method** | **Units** | **Project Action Level (PAL)** | **PAL Source** | **Laboratory-Specific Reporting Limit** |
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**B2. Methods for Environmental Information Acquisition (cont.)**

# *Subsection B2.c – Existing Information*

**B2. Methods for Environmental Information Acquisition (cont.)**

# *Subsection B2.d – Environmental Technology*

# B3. Integrity of Environmental Information

Sampling Organization:

Laboratory name and address:

Method of sample delivery (shipper/carrier):

Number of days from reporting until sample disposal:

**Sample Handling System**

|  |  |  |
| --- | --- | --- |
| **Activity** | **Organization and title of person responsible for the activity** | **SOP reference** |
| **Sample Collection, Packaging, and Shipment** | | |
| Sample labeling |  |  |
| Chain-of-custody form completion |  |  |
| Sample packaging |  |  |
| Sample shipping coordination |  |  |
| **Sample Receipt and Analysis** | | |
| Sample receipt, inspection, and log-in |  |  |
| Sample custody and storage |  |  |
| **Sample Disposal** | | |
| Sample disposal |  |  |

# B4. Quality Control

**Field and Analytical QC**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample Matrix** |  | | | | |
| **Field Sampling SOP** |  | | | | |
| **Analytical Parameter** |  | | | | |
| **Analytical Method/ Laboratory SOP** |  | | | | |
| **QC Sample** | **Frequency/Number** | **QC Acceptance Limits** | **Corrective Action** | **Person Responsible for Corrective Action** | **Data Quality Indicator** |
| Field Duplicate |  |  |  |  |  |
| Method Blank |  |  |  |  |  |
| Laboratory Control Sample |  |  |  |  |  |
| Laboratory Matrix Spike |  |  |  |  |  |
| Laboratory Matrix Spike Duplicate |  |  |  |  |  |
| Surrogates |  |  |  |  |  |
| Internal Standards |  |  |  |  |  |
| Others |  |  |  |  |  |

# B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance

**Calibration, Testing, Inspection, and Maintenance of Field Sampling Equipment and Laboratory Analytical Instruments**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Equipment/ Instrument** | **Calibration Activity** | **Testing Activity** | **Inspection Activity** | **Maintenance Activity** | **Responsible Person** | **Frequency** | **Acceptance Criteria** | **Corrective Action** | **SOP Reference** |
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# B6. Inspection/Acceptance of Supplies and Services

**Inspection/Acceptance Requirements for Supplies and Services**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Critical Supplies/ Service** | **Inspection/ Acceptance Specifications** | **Acceptance Criteria** | **Testing Method** | **Frequency** | **Responsible Individual** | **Handling/ Storage Conditions** |
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# B7. Environmental Information Management

# C1. Assessments and Response Actions

**Assessments and Corrective Action**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Assessment Type** | **Responsible for Conducting the Assessment** | **Number/ Frequency** | **Estimated Dates** | **Assessment Deliverable** | **Deliverable Due Date** | **Responsible for Responding to Assessment Findings** | **Timeframe for Response** | **Responsible for Implementing Corrective Action** | **Responsible for Monitoring Corrective Action Effectiveness** |
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# C2. Oversight and Reports to Management

**QA Reports to Management**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of Report** | **Frequency**  **(daily, weekly, monthly, quarterly, annually, etc.)** | **Projected Delivery Date(s)** | **Person(s) Responsible for Report Preparation** | **Report Recipients** |
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# D1. Environmental Information Review

Data Verification

Data Validation

# D2. Usability Determination

# References

Intergovernmental Data Quality Task Force, Uniform Federal Policy for Quality Assurance Project Plans Optimized UFP-QAPP Worksheets, March 2012

U.S. Environmental Protection Agency, Quality Assurance Project Plan Standard (S-2), CIO 2105-S-02

U.S. Environmental Protection Agency, Guidance for Quality Assurance Project Plans (QA/G-5), EPA/240/R-02/009, December 2002

U.S. Environmental Protection Agency, Guidance of Systematic Planning Using the Data Quality Objectives Process (QA/G-4), EPA/240/B-06/001, February 2006

U.S. Environmental Protection Agency, Guidance for Preparing Standard Operating Procedures (SOPs) (QA/G-6), EPA/600/B-07/001, April 2007

**FIGURES**

**APPENDIX A**

**Standard Operating Procedures**

**APPENDIX B**

**Field Forms**

**APPENDIX C**

**Laboratory Certificate of Accreditation**

**APPENDIX D**

**Checklists**