Quality Assurance Project Plan

Beneficial Use Reconnaissance Program (BURP): Streams

State of Idaho
Department of Environmental Quality

Water Quality Division

Version 3.0

May 18, 2016

TRIM Number: 2013AKL19

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1 Title and Approval Page

Quality Assurance Project Plan

Title: Beneficial Use Reconnaissance Program (BURP): Streams

Division: Water Quality Division

Version Number: 3.0

Date: May 18, 2016

TRIM Number: 2013AKL19

Approval Signatures

Note: This QAPP becomes effective on the date of the last approval signature

State Office QAPP Program Manager

Signature: _____ 5-20-16
Name: Don Essig, Surface Water Program Manager, Water Quality Division Date

State Office QAPP Project Quality Assurance Officer

Signature: _____ 6-3-16
Name: Hawk Stone, Technical Services Division Date
*Note: At the time of QAPP signature, the project QAO is required to update the DEQ QAO project document tracker, found in TRIM (record #2012AEB8).

State Office QAPP Project Manager

Signature: _____ 5/18/2016
Name: Shawna Castle, Monitoring and Assessment Coordinator, Water Quality Division Date

Regional Office QAPP Project Managers

Signature: _____
Name: Stephanie Jenkins, BURP Coordinator, Boise Regional Office

Signature: Craig Nelson
Name: Craig Nelson, BURP Coordinator, Coeur d'Alene Regional Office

Signature: _____
Name: Jason Fales, BURP Coordinator, Idaho Falls Regional Office

Signature: _____
Name: Daniel Stewart, BURP Coordinator, Lewiston Regional Office

Signature: _____
Name: Jennifer Cornell, BURP Coordinator, Pocatello Regional Office

Signature: _____
Name: Sean Woodhead, BURP Coordinator, Twin Falls Regional Office

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3 Distribution List

At a minimum, the following personnel and analytical laboratory contacts will receive either an electronic or hard copy of the final signed QAPP (Table 1).

Table 1. Project QAPP distribution list.

Name	Project Affiliation	Organization and Address/Location	Contact Number
Don Zaroban	DEQ Quality Manager	DEQ Director's Office	(208) 373-0405
Don Essig	State Office QAPP Program Manager	DEQ State Office, Water Quality Division	(208) 373-0119
Hawk Stone	State Office QAPP Project Quality Assurance Officer	DEQ State Office, Technical Services Division	(208) 373-0574
Shawna Castle	State Office QAPP Project Manager	DEQ State Office, Water Quality Division	(208) 373-0515
Stephanie Jenkins	Regional Office QAPP Project Manager	DEQ Boise Regional Office	(208) 373-0407
Craig Nelson	Regional Office QAPP Project Manager	DEQ Coeur d'Alene Regional Office	(208) 769-4610
Jason Fales	Regional Office QAPP Project Manager	DEQ Idaho Falls Regional Office	(208) 528-2679
Daniel Stewart	Regional Office QAPP Project Manager	DEQ Lewiston Regional Office	(208) 983-0808
Jennifer Cornell	Regional Office QAPP Project Manager	DEQ Pocatello Regional Office	(208) 236-5021
Sean Woodhead	Regional Office QAPP Project Manager	DEQ Twin Falls Regional Office	(208) 736-4266
Gary Lester	Analytical Laboratory	EcoAnalysts, Moscow, Idaho	(208) 882-2588

4 Project/Task Organization

Key project personnel and their responsibilities are defined in Table 2. An organizational chart is provided in Figure 1.

The project staff duties and responsibilities described in Table 2 are not intended to be all inclusive; see sections 1.2.5 through 1.2.7 of the DEQ *Quality Management Plan* (QMP) (DEQ 2012a) for a more detailed description.

This QAPP is intended to be used in conjunction with the following companion documents:

- *Beneficial Use Reconnaissance Program Field Manual for Streams* (TRIM number 2012AKL16; DEQ 2016a) (hereafter referred to as BURP manual)
- *Beneficial Use Reconnaissance Program 2016 Annual Workplan* (TRIM number 2016AKL43; DEQ 2016b) (hereafter referred to as BURP workplan)

Table 2. Key state office project personnel and associated responsibilities.

Name	Project Title/Responsibility
Don Essig	**Program/Regional Manager**: Note: The following description is *not all inclusive*; see section 1.2.7 of the DEQ QMP for a more detailed description. This person is the regional manager or State Office program manager for the project. Duties and responsibilities include: • Assists in the review of the QAPP and signs the final QAPP as an approver. • Confirms the project QAPP meets the needs of the program/region. • Ensures the QAPP is approved prior to the start of project work. • Ensures the program/regional procedures and policies referenced in the QAPP are current and approved for use. • Performs all duties and responsibilities as assigned in the project QAPP. • Selects and assigns a project quality assurance officer (QAO), who meets the criteria for independence defined in the DEQ QMP (see QAO duties below), and obtains approval for this selection from the DEQ quality manager.
Hawk Stone	**Project Quality Assurance Officer**: Note: The following description is *not all inclusive*; see section 1.2.5 of the DEQ QMP and the project QAPP for a more detailed description. Each project has an assigned QAO, whose duties and responsibilities include: • Assists in the review of the QAPP, verifies the QAPP meets the requirements of the DEQ QMP, and signs the QAPP as an approver. • All assigned QAOs are required to contact the DEQ quality manager to discuss the project prior to signing any project QAPP for approval. When the project QAO signs the QAPP for approval, the QAO is required to update the DEQ QAO project document tracker found at TRIM number 2012AEB8. • Performs an annual audit, using the QAO audit checklist located in 0, on all assigned projects to evaluate project compliance with the approved project QAPP. Files the completed audit checklist in TRIM to document the audit. • Provides data validation per the project QAPP, using the appropriate checklist located in 0, and may also participate in final project report review. • Documents all audit and data validation activities in the DEQ TRIM system, per the DEQ QMP and the approved QAPP. • In matters of project quality, this individual has a direct line of communication to the DEQ quality manager. • Must meet the following independence criteria: The QAO shall not be the project manager, program manager, or be otherwise assigned to the project data generation efforts. Neither the project manager nor the QAO may directly report to the other within the DEQ organizational structure, and both of these individuals may not be directly supervised by the same person. • Performs all other duties and responsibilities as assigned in the project QAPP. The duties and responsibilities of the project QAO also apply to any field sampling plan (FSP) generated under the project QAPP, unless an FSP-specific QAO is assigned and approved.
Shawna Castle	**State Office Project Manager**: Note: The following description is *not all inclusive*; see section 1.2.6 of the DEQ QMP and the project QAPP for a more detailed description. Each project has an assigned project manager, whose duties and responsibilities include: • Serves as the primary author of the project QAPP, and signs the final QAPP as an approver. • Performs overall project planning, document development and approval, sample planning and coordination, laboratory coordination, reporting functions, project report/summary development, and project file maintenance in TRIM. • Enters the approved and current project QAPP in the TRIM system, including a copy of the signed approval page.

	• Ensures all project work is conducted in accordance with the DEQ QMP, the approved QAPP, and the applicable project operating procedures. • Ensures that personnel assigned to this project are appropriately trained and qualified, with the corresponding training records on file in human resources. • Performs data review and verification per the project QAPP, using the appropriate checklists located in 0. • Reviews the project QAPP/FSP and standard operating procedures (SOPs) annually to determine if revision is necessary. If the project QAPP, FSP, or associated SOPs do require revision, the project manager initiates such action. All such documents will be revised, reviewed, and approved in accordance with the DEQ QMP. • Documents all audit and data review/verification activities in the DEQ TRIM system, per the DEQ QMP and approved QAPP. • Performs all other duties and responsibilities as assigned in the project QAPP. The duties and responsibilities of the project manager also apply to any FSP generated under the project QAPP, unless an FSP-specific project manager is assigned.
Stephanie Jenkins, Craig Nelson, Jason Fales, Daniel Stewart, Jennifer Cornell, Sean Woodhead	**Regional Office Project Manager:** Note: The following description is *not all inclusive*; see section 1.2.6 of the DEQ QMP and the project QAPP/FSP for a more detailed description. This person is the regional office project manager assigned to the individual project FSP (**not** the QAPP), whose duties and responsibilities include: • Oversees the project-specific aspects of the project, such as generation and implementation project and data review and verification. These duties differ from the state office project manager, whose efforts are focused primarily on issues such as generation and implementation of the statewide generic QAPP, coordinating overall statewide project aspects, etc. • Performs project-specific planning, development and approval, sample planning and laboratory coordination, regional reporting functions, regional report/summary development, and regional project file maintenance in TRIM. • Ensures the regional procedures and policies referenced in the parent statewide generic QAPP and the project-specific FSP are current and approved for use. • Ensures all project work is conducted in accordance with the DEQ QMP, the approved statewide generic QAPP, the approved FSP, and the applicable project operating procedures. • Ensures that regional office personnel assigned to this project are appropriately trained and qualified, with the corresponding training records on file in human resources. • Performs data review and verification per the project QAPP, using the appropriate checklists located in Appendix A, and documents these activities in the project TRIM system files. .
Gary Lester	**Laboratory Contact/Manager**: This person is the primary contact at the macroinvertebrate laboratory for DEQ project staff

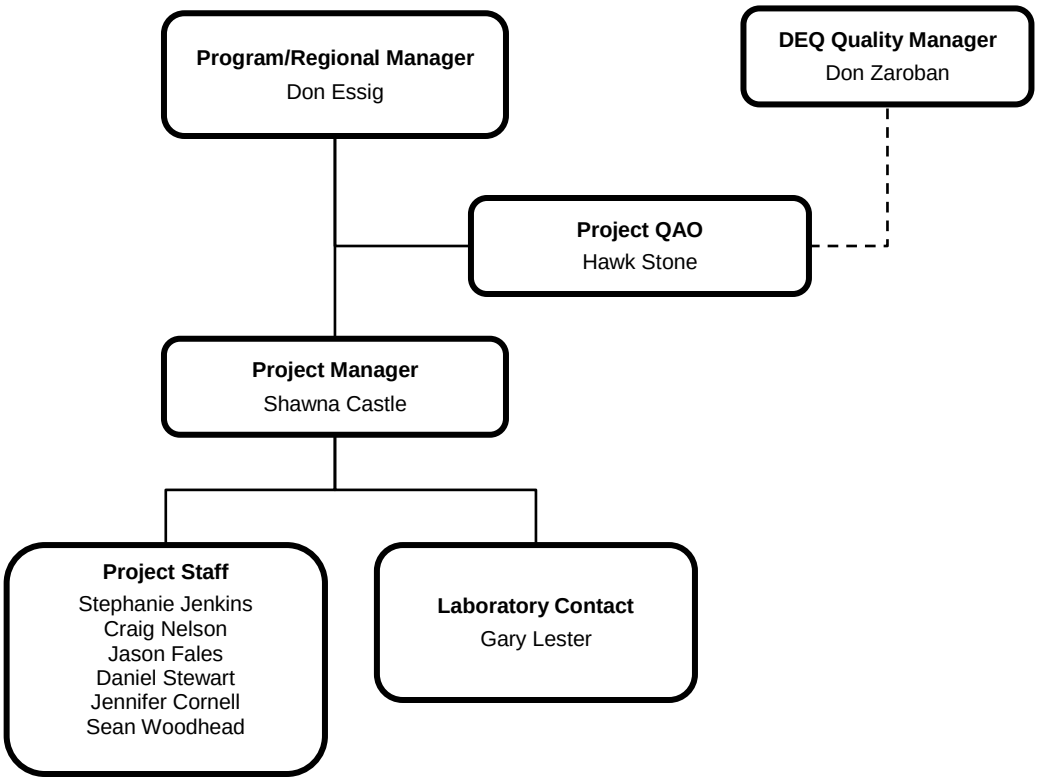

Figure 1. QAPP organizational chart.

5 Problem Definition/Background

This section describes what will be accomplished and why the project will be done, through discussion of the specific problem to be solved, project background, decisions to be made, and the outcomes to be achieved.

5.1 Problem Statement

In 1972, Congress passed Public Law 92-500, the Federal Water Pollution Control Act, commonly known as the Clean Water Act (CWA). The goal of this act was to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Water Pollution Control Federation 1987). The federal government, through the US Environmental Protection Agency (EPA), assumes the dominant role in defining and directing water pollution control programs across the country. DEQ implements the CWA in Idaho, while EPA provides oversight of Idaho's fulfillment of CWA requirements and responsibilities.

DEQ has found that one of the most efficient monitoring strategies to evaluate aquatic life is directly measuring the biological condition of the water body, a strategy known as bioassessment. Thus, DEQ has historically focused ambient monitoring efforts on bioassessment.

DEQ conducts ambient monitoring through the Beneficial Use Reconnaissance Program (BURP).

BURP is an ambient monitoring program aimed at integrating biological and chemical monitoring with physical habitat assessment as a way of characterizing water quality (McIntyre 1993). BURP mainly addresses small streams and large rivers, and the program closely follows concepts and methods described in EPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers* (Barbour et al. 1999).

BURP provides consistent ambient monitoring data for beneficial use support assessments. BURP efforts have focused primarily on wadeable streams.

BURP monitoring under this QAPP is intended to meet three goals of the Ambient Monitoring Plan (AMP) (DEQ 2012):

1. Determine the condition of Idaho wadeable streams through probabilistic surveys.
2. Identify wadeable streams that are impaired and require a TMDL through targeted monitoring.
3. Identify the expectations (reference condition) for Idaho wadeable streams.

This QAPP is intended to cover BURP activities associated with wadeable streams as defined by BURP (DEQ 2016a). Field methods are described in detail in the BURP manual (DEQ 2016a). The scientific basis for, and method to, analyze BURP field data are described in *Small Stream Ecological Assessment Framework* (Grafe 2002) and *Water Body Assessment Guidance* (Grafe et al. 2002).

5.2 Intended Usage of Data

Data collected under this QAPP are primarily intended for determining support of cold water aquatic life beneficial uses. Data are used to generate scores and ratings for the Stream Macroinvertebrate Index (SMI), Stream Fish Index (SFI), and Stream Habitat Index (SHI), as described in *Water Body Assessment Guidance* (Grafe et al. 2002). Raw data and index scores are stored in DEQ EDAS2 Central Database and will be available to the public through the DEQ website. These indices are then used to inform assessment decisions. Results of assessment decisions are recorded in the Assessment Data Base (ADB), and will be available as part of Idaho's biennial Integrated Report.

6 Project/Task Description

This section describes (in general terms) how, when, and where the project will be implemented through a summary of how the work will be performed, what data are to be obtained, where the data gathering activities will occur, and the related projected schedule.

6.1 General Overview of Project

All sampling procedures will follow the procedure outlined in the BURP manual (DEQ 2016a).

In brief, field crews delineate a representative sample reach that is 30 times the general bankfull width of the stream, or a minimum of 100 meters. Crews demarcate three transects at three separate, relatively evenly spaced riffle habitats within the sample reach.

Macroinvertebrates—A single macroinvertebrate sample is collected at each transect using a Hess or Surber sampler. The three macroinvertebrate samples are either composited in the field or by a contract laboratory providing the taxonomic identification (DEQ 2016a).

Fish—The entire reach is electrofished following the protocols outlined in the BURP manual (DEQ 2016a). Fish are identified to the lowest taxonomic level possible in the field, and representative fish are vouchered to confirm or refine field identification. Due to collection permit and logistical limitations, not all sites sampled will be electrofished.

Habitat—Crews conduct a modified Wolman pebble count at each of the three transects and measure canopy closure with a concave densiometer at each of the three transects and again 10 meters upstream from each transect. Crews count all large organic debris (>10 centimeters diameter and >1 meters long) within the bankfull width. Bank stability and bank vegetative cover are measured for the entire sample reach; instream cover, particle embeddedness, channel shape, disruptive pressure, and zone of influence are visually estimated for the entire sample reach.

6.2 Project Timetable

This section describes the projected schedule for the major project activities, such as field sampling, data review, and report generation. A general project timetable for BURP activities is presented in Table 3.

Table 3. General project timetable for BURP activities.

Activity Completion Date	Staff Responsible	Activity
March 1	FSP Regional Project Manager	Identify sites for targeted monitoring, submit to SO for inclusion in annual workplan and electrofish permit
March 1	State Office QAPP Project Manager	Inventory and order field supplies
March 15	State Office QAPP Project Manager	Apply for electrofish permit
April 1	State Office QAPP Project Manager	Draft annual workplan
April 30	FSP Regional Project Manager	Secure site access permission, review related data, coordinate with other agencies
May 31	FSP Regional Project Manager and State Office QAPP Project Manager	Pretraining coordination activities
June 15- 30	FSP Regional Project Manager and State Office QAPP Project Managers	Complete centralized crew training
July 1–September 30	FSP Regional Project Manager	Complete all field monitoring
October 15	FSP Regional Project Manager	Submit all field data to EDAS 2 Central Database
October 31	FSP Regional Project Manager	Submit all samples to appropriate laboratory
June 1	State Office QAPP Project Manager	Reconcile fish data, enter laboratory results into the EDAS 2 Central Database

7 Quality Objectives and Criteria

This section of the project QAPP defines the project data quality objectives (DQOs), essentially defining the requirements to support the qualitative or quantitative design of the data collection effort. DQOs are also used to assess the adequacy of the data (new or existing) in relation to their intended use. Data quality indicators (DQIs) are used to describe, in part, the specific measurement elements to be used when evaluating data in support of the project DQOs. Project staff can find additional information and guidance concerning the DQO process and DQI selection and definition in the following reference materials:

- EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006a)
- EPA *Guidance for Quality Assurance Project Plans* (EPA 2002a)
- EPA *Requirements for Quality Assurance Project Plans* (EPA 2001)
- EPA *Guidance on Environmental Data Verification and Data Validation* (EPA 2002b)

The objective of quality assurance and quality control (QA/QC) is to ensure that results obtained by BURP monitoring are representative of actual biological, chemical, and physical conditions of the stream. Field QA/QC will consist of following a standard protocol for sample collection.

The concept of *analytical data support* is generally described as having five levels, where Level I is considered minimal QA/QC control/documentation, and Level V is considered the highest available QA/QC control/documentation.

The appropriate type of sampling and analysis for a given project or at a given site depends on numerous factors, the foremost of which are the intended end use of the data and associated data

quality requirements. The project manager, in consultation with appropriate regional and state office management, will determine the appropriate "level" of analytical data support.

Since individual laboratories frequently describe the analytical data support provided by their facility in a variety of terms other than "level," such as "stages," "classes," or "packages," the data levels described herein should only be used as a general guide for project staff when setting project-specific data analytical support requirements with the selected project laboratory. It is the responsibility of the project manager to contact the selected project laboratory to discuss and establish the analytical data support level to be employed for the individual project. Issues to consider when setting these requirements with the project-specific laboratory include the level of QC that the laboratory will employ when analyzing the samples, and equally important, what documentation will accompany the returned results.

The analytical data support level determined to be necessary and appropriate for each project is clearly stated in this section of the QAPP.

The five levels of analytical support (Levels I and II, field analytical methods, and Levels III through V, laboratory analytical methods) are described below in general terms.

Included below in the general description of the analytical data support level is the generally associated and/or corresponding "stage" of data verification and validation to be applied upon receipt of data and documentation by the project from the laboratory. The verification and validation "stages" are described in detail in EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

While a given laboratory may or may not recognize various descriptions of analytical data support levels, the laboratory will likely be able to support the needs of the data user if the "stage" of data verification and validation is also described to laboratory staff. For these reasons, it is strongly suggested that the project manager communicate this information directly to the laboratory during the planning phase to determine the necessary analytical data support (level or package) that the laboratory will provide to the project.

Level I: This refers to field screening or analyses using portable instruments, and results are commonly not compound-specific or quantitative. Generally, Level I data are related to activities such as locating sample collection points for laboratory analysis and are associated with instruments such as photoionization detectors (PIDs).

Generally associated verification/validation stage: Level I may be associated, depending on data user requirements, with "Stage 1" verification and validation checks as described in Appendix A, Section 1.1, of EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Level II: This refers to field analyses using more sophisticated portable analytical instruments or mobile laboratories onsite. Data generated can range from qualitative to quantitative (e.g., actual contaminant identification is made, but concentrations may or may not be quantified to a high degree of accuracy). Note that this data may or may not be acceptable for compliance purposes. Restrictions or limitations on the use of such data, if applicable, are stated below. Many types of field equipment—such as a mercury vapor analyzers and/or an X-ray fluorescence (XRF) units—generate data that may (or may not) qualify as Level II data.

Generally associated verification/validation stage: Level II may be associated, depending on data user requirements, with "Stage 1" or "Stage 2A" verification and validation checks as described in Appendix A, Sections 1.1 and 1.2, respectively, of EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Level III: This level refers to standard EPA-approved methods that may be equivalent to Level IV methods (see below), with the exception that the level of documentation supplied with analytical results is frequently less robust.

Generally associated verification/validation stage: Level III may be associated, depending on data user requirements, with "Stage 2A" or "Stage 2B" verification and validation checks as described in Appendix A, Sections 1.2 and 1.3, respectively, of EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Level IV: This refers to EPA Contract Lab Program (CLP) Routine Analytical Services (RAS) analyses, or EPA-approved methods (Level III), with the exception that additional rigorous QA/QC protocols are employed and full documentation is provided by the laboratory to the project. Documentation allows validation of results against specific contractual requirements and allows for detailed data use, restriction, and/or limitations to be identified prior to use of data. Requirements or limitations for a Level IV analysis and full validation of the analytical data, if necessary, are specified below.

Generally associated verification/validation stage: Level IV may be associated, depending on data user requirements, with "Stage 4" verification and validation checks as described in Appendix A, Section 1.5, of EPA's *Guidance for labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Level V: This refers to nonstandard methods that are considered to be more rigorous than Level IV methods. This analytical data level is very seldom used and must be accompanied by significant evidence substantiating the validity of the nonstandard methods employed. Level V is generally used when extremely accurate/precise measurements and quality documentation, far beyond standard EPA methods, are deemed necessary for site-specific contaminant identifications and quantitation.

Generally associated verification/validation stage: Level V may be associated, at a minimum, with the "Stage 4" verification and validation checks as described in Appendix A, Section 1.5, of EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009).

Riparian habitat, in-stream habitat, field identification of fish species, and field parameter data are at data quality Level II.

Laboratory analytical data (i.e., data from samples submitted to a laboratory for analysis) are at data quality Level III (standard laboratory procedures and data reviewed by standard QA protocols).

7.1 Data Accuracy, Precision, and Measurement Range

Accuracy is a measure of the agreement between a "true" or reference value and the associated measured value.

Laboratory Control Samples are not appropriate for the biological samples collected under this QAPP, accuracy requirements for this project are met through laboratory procedures as defined under DEQ's contract agreements with the analytical laboratories and in section 0.

Precision is a measure of agreement between two measurements of the same property under prescribed conditions. Sampling campaigns include duplicate samples (field replicates or split samples—see section 14) or may rely on LCS split sample results. The relative percent difference (RPD) of duplicate samples will be used to assess data precision. For field duplicates Equation 1 will be used to calculate RPD:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100$$

Equation 1. Relative percent difference (RPD).

Where: C_1 = value of first measurement
C_2 = value of second measurement /duplicate sample

Measures of accuracy and precision are inappropriate for use in samples of macroinvertebrate and fish community structure. QC is achieved through proper taxonomist training and clear taxonomy.

7.2 Data Representativeness

Representativeness is the degree to which the sample data accurately and precisely represent site conditions. The representativeness criterion is best satisfied by ensuring that sampling locations are properly selected, sample collection procedures are appropriate and consistently followed, a sufficient number of samples are collected, and analytical results meet DQOs. All sampling procedures will follow the sampling procedure in the BURP manual (DEQ 2016a). Representativeness is evaluated during data review, verification, validation, and reconciliation efforts by comparing the combination of data accuracy, precision, measurement range, and methods and assessing other potential sources of bias, including sample holding times, reported results of blank samples, and laboratory QA review.

7.3 Data Comparability

Comparability is the confidence with which one data set can be compared to another data set. Using standard sampling and analytical procedures will maximize comparability. To ensure data comparability, sample collection procedures (DEQ 2016a) will be consistently followed, the same analytical procedures will be used, and the same laboratory will be used to analyze the samples throughout each project.

7.4 Data Completeness

Completeness is the percentage of valid data relative to the total possible data points. For data to be considered valid, it must meet all of the acceptance criteria, including accuracy and precision, and any other criteria specified by the analytical method used. The overall DQO for completeness for the sampling events conducted under this QAPP is 80%. If the sampling event

does not meet the quality assurance goal of 80%, the data will be discussed with the program manager and a course of action agreed upon. Any required departure from this goal will be justified and explained in the project records in accordance with the QMP.

8 Special Training/Certification

All specialized or nonroutine training, qualifications, or certifications necessary for project and/or laboratory staff is listed below.

The project manager is responsible for ensuring that personnel assigned to this project are properly trained and qualified, with the appropriate training records on file with DEQ human resources.

- BURP centralized training (40 hours)
- 8 hours electrofish training (on-the-job with coordinator)
- 4 hours fish identification (on-the-job with coordinator)
- First aid, CPR, and wilderness training

All work performed by DEQ personnel will be conducted in accordance with the *Idaho General Safety and Health Standards* (Division of Building Safety 2006).

In addition to this safety standard, project personnel will also comply with the requirements found in the BURP manual (DEQ 2016a).

9 Documentation and Records

QAPP-assigned state office project staff is responsible for project-related statewide documentation and records, including the following, if applicable to the project:

- The statewide QAPP
- Laboratory reports and laboratory data
- Statewide reports summarizing program and/or regional data and information
- Project-related division/program SOPs
- Training records for assigned state office staff
- QAPP audit and assessment reports
- QAO project document tracker spreadsheet updates related to QAPPs (TRIM number 2012AEB8)
- Corrective action reports and plans

QAPP-assigned regional office project staff is responsible for project-specific documentation and records, including the following, if applicable to the project:

- Regional project-specific reports
- Sample chain-of-custody records
- Project-specific field notes, sheets, forms, checklists, etc.
- Data review, verification, and validation checklists and related documentation
- Project-related regional SOPs

- Training records for assigned regional office staff
- Corrective action reports and plans

Project documents will be filed electronically in TRIM in accordance with applicable program filing procedures. The applicable project managers are responsible for ensuring that a copy of the current approved (and signed) project QAPP is available in TRIM. A copy of the signed signature page for the QAPP is to be filed in the TRIM system by the applicable project manager. Preferably, the approved document, including the signed signature page, is attached to the TRIM record in PDF format.

Field personnel shall use the BURP Electronic Field Forms to document each day's activities. Project data must be recorded directly, promptly, and accurately (DEQ 2013).

All documentation necessary to support the objectives of the project and the validity of project data—chain-of-custody forms, audit reports, laboratory reports, field notes, field logbooks, etc.—shall be stored electronically in the EDAS2 Central Database or entered into the project TRIM system files. Annual project audit and assessment documentation, per the DEQ QMP, shall also be entered into the TRIM system by the applicable project QAO and/or the applicable project manager.

All project documentation and records shall be retained in the TRIM system in accordance with the current approved DEQ records retention schedule (TRIM number 2010AIC3).

10 Sampling Process Design

This section describes the project data collection activities, assumptions, sampling site selection, general descriptions of the number of samples to be taken, the number of sampling locations, if samples are to be individually handled or composited, and any other relevant project-specific information.

10.1 Rationale for Selection of Sampling Sites

The BURP workplan (DEQ 2016b) will identify candidate sample locations. Site selection rationale shall follow the procedures outlined in the BURP manual (DEQ 2016a) and *Water Body Assessment Guidance* (Grafe et al. 2002).

10.2 Sample Design Logistics

Sampling logistics for this project, such as sample locations and handling, will be detailed in the BURP workplan (DEQ 2016b).

11 Sampling Methods

This section describes the procedures used to obtain project samples, lists the equipment necessary to perform the sampling activities, and describes the actions to be taken if problems arise in the field.

Personal protective equipment (PPE) necessary to perform the field work for this project shall be consistent with the requirements of the *Idaho General Safety and Health Standards* (Division of Building Safety 2006) and all project-specific health and safety plans associated with the project.

In addition to these PPE requirements, the following specific PPE is recommended for field work associated with this project:

- Waders and boots
- Polarized safety lenses

QA/QC procedures as specified for sample collection will be followed by sampling personnel. The QA/QC procedures will be fulfilled by adhering to all requirements detailed in this QAPP, the FSP, and the BURP manual (DEQ 2016a). Such adherence will be demonstrated through appropriate documentation of sampling procedures within the electronic field data sheets as described herein. Field audits by the applicable project QAO are also a required part of QA/QC procedures.

Field audits will be used to confirm that field crews are conducting monitoring in accordance with the BURP manual (DEQ 2016a) and this QAPP. If the audited field crew is found to be conducting monitoring inconsistent with the procedures detailed in the BURP manual (DEQ 2016a) and/or this QAPP, the program manager, state office and regional office manager, and regional manager will be notified and corrective action will be taken to ensure data quality is met.

Fieldwork quality will be controlled by following the BURP manual (DEQ 2016a) during each sampling event, and using consistent sampling containers and laboratories. Procedures for all sampling events, including equipment decontamination, chain-of-custody forms, and sample blanks, are found in the BURP manual (DEQ 2016a) and further detailed in the project-specific FSP. Detailed field notes will be taken for QC and proper sample identification. An example electronic field form is provided in the BURP manual (DEQ 2016a).

Analytes, laboratories, and shipping addresses are included in Table 4. Analytical methods, sample containers, preservation methods, and holding times are identified in section 13 and Table 5.

Table 4. Analytes and laboratories.

Parameter	Analyzing Laboratory	Shipping Address
Benthic macroinvertebrates/periphyton	EcoAnalysts, Inc.	1420 S. Blaine Street, Suite 14 Moscow, ID 83843
Vouchered fish	Orma J. Smith Museum of Natural History	College of Idaho, 2112 E. Cleveland Blvd, Caldwell, ID 83605

12 Sample Handling and Custody

Samples will be collected by DEQ personnel into laboratory-supplied sampling containers (i.e., from an analytical laboratory, laboratory supplier, or laboratory equipment provider), labeled, placed in an appropriate container, and transported to the laboratory, DEQ, or shipment location.

DEQ personnel will oversee proper storage and handling of all samples collected until transferred to the appropriate analytical facility or properly discarded by DEQ. Chain-of-custody forms will be used to document sample custody and transfer. Protocols for chain-of-custody forms, sample handling, etc., are found in the BURP manual (DEQ 2016a). Chain-of-custody forms will accompany the samples from sample collection throughout the shipping process and shall be filed in the project TRIM system files by the applicable project manager.

13 Analytical Methods

Table 5 lists the sample type, container type, preservative, and holding times applicable to all samples obtained under this project. Sample containers, labels, and preservatives will be obtained from the analytical laboratory, laboratory supplier, or laboratory equipment provider. Samples must be preserved and analyzed within the holding times. The laboratory will be notified by the project manager prior to sample shipment. All sample collection and preparation instructions provided by the analytical laboratory will be followed throughout the duration of each project.

Table 5. Sample type, container types, preservation method, and sampling holding times.

Sample Parameter	Analytical Method	Sample container	Preservative	Holding Time
Benthic macroinvertebrate identification	Lowest practical taxonomic level	1 quart PET jar	95% ethanol	1 year
Vouchered fish	Lowest practical taxonomic level	1 liter HDPE Nalgene bottle	10% buffered formalin	1 year

14 Quality Control

Generally speaking, quality control is a means of measuring or estimating the potential variability involved with sample collection, analysis, or measurement activities in the field and in the laboratory. This section will discuss the various QC activities associated with this project.

14.1 Laboratory Quality Control Checks

Laboratory QC for biological samples shall be as described in the following sections. Duplicates can be “replicates” (samples taken one immediately after the other, separated only by the actual time required to fill the sample container) or “splits” (subsamples drawn from the same initial volume of matrix).

Laboratory QC checks include internal checks for sample analysis activities, duplicate samples, and blanks. The following paragraphs describe common components of laboratory QA/QC programs.

14.1.1 Benthic Macroinvertebrates

Minimum total abundance/count

Generally, total sample abundance of less than 150 individual macroinvertebrates indicates a sampling error. These samples are flagged as “low bugs” and caution should be used in interpreting the results of SMI scores generated from these samples. A high occurrence of sites flagged as “low bugs” from a single crew may indicate a systematic sampling failure by the field crew. If any BURP crew has greater than 5% of sites flagged as “low bugs” the QAO, state office project manager, state office program manager, and regional office project manager will discuss the need to reject all data from that field crew.

10% in-house QA/QC of subsampling

The contractor will perform QA/QC on the subsampling of at least 10% of all samples. Samples are to be combined in the Caton tray and the appropriate number of grid squares selected at random to obtain 500 (± 10%) individuals for identification. Following this, another qualified employee of the contractor must examine all the material from the selected squares and check for invertebrates that were missed. At least 95% of all the invertebrates in the selected squares must have been removed for identification. If less than 95% of the sample has been picked, the sample and all the material from the grid squares not selected must be placed back into the Caton tray

and redistributed for a new random subsample to be taken. The new subsample must be rechecked before identifications can occur on the macroinvertebrates that were selected.

10% in-house QA/QC of identifications

The contractor will perform QA/QC on the identification of at least 10% of all samples. Once a taxonomist has completed the identification and enumeration of all the macroinvertebrates in a subsample, the subsample must be repackaged, and then another qualified taxonomist employed by the contractor will reidentify and reenumerate the subsample independently of the first taxonomist. Once this has been completed for a site, the contractor must perform a percent similarity calculation. The percent similarity must be 95% or greater. Before further samples are processed, the taxonomists must confer to reconcile any discrepancies. For any specimens that are unknown or in question, the results will be reported at the next higher taxonomic level for that group, and the specimen will be sent to an expert in that taxonomic group for identification at the expense of the contractor.

A report of this process, including the results of the percent similarity calculation, will be provided to the project manager.

14.1.2 Vouchered Fish

The contractor will perform QA/QC on the identification of at least 10% of all samples for verification and quality assurance. The percent similarity must be 95% or greater. Before further samples are processed, the taxonomists must confer to reconcile any discrepancies. For any specimens that are unknown or in question, the results will be reported at the next higher taxonomic level for that group, and the specimen will be sent to an expert in that taxonomic group for identification at the expense of the contractor. Corrective actions, as needed, will be documented in the event that control limits are exceeded.

A report of this process, including the results of the percent similarity calculation, will be provided to the project manager.

14.2 Data Analysis Quality Control Checks

Laboratory QC checks are routinely performed as part of the analysis process. The frequency and type of QC samples are often analysis method-dependent and include reagent blanks, matrix spikes, and internal laboratory splits. Analyzing laboratories will report any variance from QC limits impacting the quality of sample results and may report details of internal laboratory QC if requested. The analytical laboratory may provide appropriate sample containers, chain-of-custody forms, sample labels, and any necessary container seals. Laboratory QA/QC and data reports will be filed in TRIM following applicable filing protocols.

Laboratory QC checks include internal checks for sample analysis activities, duplicate samples, and blanks. The following paragraphs describe common components of laboratory QA/QC programs.

Laboratory Blanks

A laboratory blank is a sample of known matrix where the specific constituents requested for analysis are known to be absent or are present at concentrations less than the laboratory minimum limit of detection. The laboratory blank is analyzed to evaluate the accuracy of the analysis.

Laboratory control samples (LCSs) are samples that contain a known concentration of analytes and are analyzed to assess the overall method performance. They undergo the same preparatory and determinative procedures as the project samples and are the primary indicator of laboratory performance. LCS recoveries are used to measure accuracy. The RPD for duplicate LCS recoveries is used to measure precision.

A **laboratory duplicate sample** is a sample that is split by the laboratory into two separate and identical samples. The two samples are analyzed and a comparison of the results (RPD) is used to assess laboratory precision.

A **matrix spike** (MS) sample has a known amount of the target analyte added to project matrix before analysis to assess possible matrix interferences on the analysis. Percent recoveries on MS samples should be compared to percent recoveries of LCS samples. An MS/**matrix spike duplicate** (MSD) pair can be used to assess precision.

The QC check data may be checked/reviewed for quality by the applicable regional office project manager or the QAO at any time during the project and must be checked after all of the data are collected. Corrective actions, as needed, will be documented in the event that control limits are exceeded. Data qualifiers will be assigned following appropriate data verification/validation procedures. Any qualifiers added will be defined in the project summary/technical report and will be consistent with EPA QA/G-8 (EPA 2002b).

15 Instrument/Equipment Testing, Inspection, and Maintenance

Laboratory instrument/equipment testing, inspection, and maintenance are performed and documented by the laboratory if/as required by the State of Idaho laboratory certification process. Procedures and schedules for preventive maintenance of sampling equipment are the responsibility of the laboratory. Each instrument or item of laboratory equipment will be maintained periodically to ensure accuracy. These procedures and frequency of performance are designated in the individual instrument manuals.

Project field instrument/equipment testing, inspection, and maintenance will be performed in accordance with the individual instrument/equipment manual and the BURP manual (DEQ 2016a).

Records of equipment calibration will be kept and made available to the QAO during the field audit.

16 Instrument/Equipment Calibration and Frequency

Laboratory instrument calibration is conducted and documented by the laboratories if/as required by the State of Idaho laboratory certification process.

All field monitoring equipment for the measurement of field parameters (temperature, specific conductance, flow) will be calibrated and maintained as recommended by the manufacturer, or as found in individual instrument/equipment manuals, to ensure accuracy within specified limits. Calibration details will be recorded in a logbook or field sheet that is registered in TRIM. Field equipment used to collect samples will be calibrated according to manufacturers' procedures or internal guidelines or following the BURP manual (DEQ 2016a). Each instrument or item will be visually inspected by field sampling personnel for damage and operability prior to each sampling event.

17 Inspection/Acceptance of Supplies and Consumables

The supplies and consumable items required for monitoring projects will be consistent with the BURP manual (DEQ 2016a). All sample containers will be obtained from the analytical laboratory, laboratory supplier, or laboratory equipment provider. All sampling supplies and consumable items will be new, inspected for acceptance by the regional office project manager prior to use, and used once during each sample collection event.

18 Nondirect Measurements and Data Acquisition

Nondirect measurements and data acquisition refer to data obtained *for use by the project* from existing data sources, not directly measured or generated in the scope of this project. This type of data is often referred to as “existing data.” Examples of this type of data include data obtained from existing sources or databases (either from within or outside DEQ) and data obtained by others and offered or presented to DEQ for use.

This section describes all nondirect measurements and data acquired for use by the project, including the following:

1. Source of the data
2. List/description of the information/data to be used
3. Intended use of the data
4. Description of how the data will be used in the decision-making process
5. Specific criteria to be used for data acceptance or rejection prior to use, including what information will be used to determine if the data are of sufficient quality for use by the project
6. Specific criteria used to determine data use limitations
7. Other relevant information

Project staffs are strongly encouraged to review the EPA guidance for acquisition and use of nondirect measurements (existing data) presented in chapter 3 of EPA QA/G-5 (EPA 2002a).

Laboratories shall provide DEQ with a data package that includes the analytical results of the submitted samples, the QA/QC report for the analyses, and a copy of the chain-of-custody record. Laboratories may be requested to provide results and reports in an electronic format.

No nondirect data are expected to be acquired or used by this project.

19 Data Management

All electronic field data will be transferred to the EDAS2 Central Database following the protocol in the *Electronic Field Forms Manual* (DEQ 2013). Electronic copies of any additional field notes and laboratory reports will be kept in TRIM. Hard copies of field notes, calibration records, and laboratory data reports will be kept at least until data review, verification, validation, reconciliation with user requirements, and reporting is complete. Additional document retention requirements may apply per project-specific, program, state, or federal requirements. It is the responsibility of the project manager to ensure all document retention requirements are met.

The analytical results for the project will be uploaded to the EDAS2 Central Database, after review by the state office project manager and state office QAO to ensure laboratory DQO are met, and will be available to the public through the DEQ online mapping application.

20 Assessment and Response Actions

This section describes major project assessment and response actions only. For a complete listing of state/regional office project staff duties and responsibilities, see section 4 of this QAPP, and the DEQ 2012 QMP.

State and regional office coordination: Project staff from the state and regional offices shall work in close coordination when performing project assessment and audit functions. If issues or concerns are identified in the conduct of such efforts, state and regional project staff shall communicate and discuss the issues and concerns to ensure a coordinated response effort. For example, if the state office identifies a QAPP discrepancy that leads to revision of the document, any such revision must be discussed with and communicated to affected regional staff to ensure FSP compliance with the newly revised QAPP.

State office activities: The state office QAO shall audit the QAPP annually, per the DEQ QMP, to determine if revision is necessary. Audits shall utilize the checklist in 0 and will be documented in TRIM, indicating the date of the audit and listing identified issues or concerns in accordance with the QMP. If the project QAPP requires revision by the state office project manager as a result of this audit or review, these actions will be taken and the revised QAPP submitted for approval prior to implementation, per the DEQ QMP (DEQ 2012a).

The QAPP audit shall be conducted by the state office project QAO and will include reviewing selected regional FSPs, reviewing field notes and laboratory reports, and conducting field and laboratory audits where possible and resources allow. Any errors or inconsistencies identified in the field notes will be investigated and corrected to ensure the integrity of the data and

conformance to the QAPP and selected FSP. Results of internal laboratory QA review, audits, surveillances, or other types of laboratory assessments will also be taken into account.

The state office project manager should also review the project QAPP on an annual basis to ensure the document continues to meet the needs of the data user(s). However, the state office QAO will perform assessment of the project independently of the state office project manager.

Regional office activities: If unexpected analytical results are reported for any reason, the regional office project manager will contact the laboratory to perform an additional quality review of the data in question. A note to the file will be included with the field notes and laboratory reports if any follow-up QA activities regarding field notes or laboratory reports are required and conducted.

21 Reports to Management

Project and sample results for the BURP monitoring will be presented in the biennial Integrated Report.

22 Data Review, Verification, and Validation

Data review is conducted (ideally by the regional office project manager or project technical staff) to ensure that project data have been recorded, transmitted, and processed correctly. Data review is normally performed by the unit/staff generating the data.

Data review is facilitated by using the BURP electronic field forms prior to leaving a sampling location

Data verification is generally conducted (ideally by the regional office project manager or project technical staff) following data review and is performed to evaluate the completeness, correctness, conformance, and compliance of the data against the QAPP-specified methodological, procedural, or contractual requirements. The purpose of data verification is to evaluate the extent to which the sample collection requirements, analytical processes prescribed in the QAPP, and specified project procedures were followed. Data verification essentially evaluates the actual project performance against the requirements established in the QAPP. The output from this process is considered and evaluated during the reconciliation with user requirements (assessment) phase. Data verification is normally performed by the unit/staff generating the data.

Data verification is facilitated by performing the coordinator’s desktop review.

Data validation shall be conducted by the project QAO or a subject matter expert not otherwise assigned to the project or unit generating data. This process shall follow data review and verification and is an analyte- and sample-specific process that extends the data evaluation beyond method, procedure, or contractual compliance to determine the quality of a specific data set relative to the end use. This effort should focus on the project-specific data needs and note any potentially unacceptable departures from the QAPP. The output from this process is considered and evaluated during the reconciliation with user requirements (assessment) phase.

Data validation is generally performed by an independent entity not closely associated with the unit generating the data.

Data review, verification, and validation tasks for statewide generic QAPP projects are assigned to regional office project staff by position title, such as the project manager or project QAO, in section 23 of the project QAPP.

The level of documentation required for a specific project data review, verification, validation, and reconciliation effort is specified below. This level of documentation is determined by the project manager, in consultation with the regional and program manager, consistent with the "graded approach" used by DEQ in implementing the quality management system.

Those assigned to perform project data review, verification, and validation *shall use the associated checklist provided in the FSP to* ***perform and document*** the effort in the associated project TRIM file system.

23 Review, Verification, and Validation Methods

Data review, verification, and validation efforts are based on the analytical support determined to be necessary in the planning stages of the project. DEQ personnel performing data verification and validation are encouraged to review the following guidance documents:

- EPA QA/G-8 (EPA 2002b) for guidance on methods for this task
- Appendix A of EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009)
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2008)

Data review for data and information collected under this QAPP shall be performed by the regional office project manager using the data review checklist found in Appendix A. This review will also include evaluation of supplied laboratory data reports. Data review will include the following activities, at a minimum:

- An examination of project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.
- An examination to ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.
- An examination to identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP and FSP, have been received and are available for the verification and validation process.
- A completeness check to determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.

- An examination to ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP and FSP, have been received from the applicable laboratories.
- An examination to identify programming and/or software related errors, if applicable to the project.

Data verification for data and information collected under this QAPP shall be performed by the regional office project manager using the data verification checklist found in Appendix A. The general focus of the process is to identify if all requirements specified in the project QAPP, associated procedures, and project contractual requirements (if applicable), have been met, and if not, to determine the extent to which requirements failed to be achieved. Data verification will include the following activities, at a minimum:

- Verification that all data completeness criteria, as stated in the project QAPP, have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.
- Verification that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP.
- Verification that the required analytical methods, as listed in the project QAPP, correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.
- Verification that QAPP requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.
- Verification that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP. If not, identify any limitations or restriction on the use of such data.
- Verification that data and sample collection practices adhere to procedural requirements to include a review of project logs and field notes, as applicable.
- Verification that sample handling activities conform to QAPP requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
- Verification that data calculation and handling activities conform to QAPP requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
- Verification that any remaining or unique project QAPP or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
- Determination and documentation of any limitations on the use of the project data.

Data validation for data and information collected under this statewide generic QAPP and associated FSPs shall be performed by the project QAO or designated subject matter expert not otherwise assigned to the project or unit generating data. Data validation efforts shall use the data validation checklist found in Appendix A. The general focus of the process is to identify if the quality of the project data meets the needs of the data user and the associated decision makers.

The data validation effort for this project shall include a minimum of 10% of all project data with a goal of 20%, except as noted specifically below. Data validation will include the following activities, at a minimum:

- An evaluation and examination of all (100%) obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
- A review of project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.
- A review of the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.
- A determination, when necessary and where possible, of the reasons for any failure to meet methodological, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data.
- A comparison of the project DQOs, as defined in the project QAPP, to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.
- A determination of the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project?
- Determination and documentation of any limitations on the use of the project data.
- A determination of the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

Any potentially unacceptable departures from the requirements of the project QAPP will be noted during the data review, verification, and validation process. If the applicable project manager or the applicable project QAO determines the data do not meet the needs of the project or the DQOs of the QAPP, and/or if the conclusions drawn from the data do not appear to be reasonable, the applicable project manager and the applicable QAO shall immediately report such findings to the appropriate regional manager and the state office program manager to determine the necessary corrective actions. Documentation of such findings and activities shall be maintained in accordance with the DEQ QMP.

24 Reconciliation with User Requirements

Data quality assessment (DQA) will be performed in accordance with this QAPP, project-specific FSP, and the DEQ QMP (DEQ 2012a). Additional guidance for conducting data assessment can be found in EPA QA/G-9R or EPA QA/G-9S (EPA 2006b, c).

The DQA will be performed (at a minimum) by the regional office project manager and the regional office project QAO to determine if the project data set is of the right type, quality, and quantity to achieve the objectives of the project and can confidently be used to make an informed decision.

Information and findings associated with the project data review, verification, and validation efforts shall be considered during the data assessment process.

When DQOs are not met, the regional project manager and/or the regional manager will discuss appropriate corrective actions with the state office project manager and/or the state office program manager. Corrective actions may be initiated to suggest improvements to data collection activities, data and sample handling techniques, internal laboratory quality procedures, etc., to solve quality issues.

If the state or regional office project manager or the state or regional project QAO decide the project data do not meet the project needs or the QAPP DQOs, and/or if the conclusions drawn from the data do not appear to be reasonable, the matter will be referred by the project managers to the regional FSP manager and the state office program manager to determine and document the necessary corrective actions.

If sampling activities require revision, the project QAPP and/or FSP will be revised as necessary. Following revision and prior to implementation, the revised project QAPP and/or FSP must be reapproved in accordance with the DEQ QMP (DEQ 2012a).

25 References

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Appendix A. QAPP Project QAO Annual Audit Checklists

All checklists in this appendix are available for download and use by project staff as standalone electronic documents, from either the DEQ TRIM system or the DEQ Quality System website: http://insidedeq.deq-intra/director/quality.htm.

Prior to using an activity checklist, project staff should review the applicable requirements listed in the project QAPP and the QMP.

The following checklists are included in this appendix:

- Data Review—TRIM number 2012AEB2
- Data Verification—TRIM number 2012AEB3
- Data Validation—TRIM number 2012AEB4
- Project QAO Annual Audit—TRIM number 2012AEB5

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DEQ QAPP/FSP Checklist—Data Review

The individual assigned in the project QAPP/FSP to perform project **data review** *shall complete and file this checklist in the appropriate project TRIM system files.* Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Review	Date Completed
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

Check the following review boxes following completion of each listed task.

Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.

Yes	No	
☐	☐	Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
☐	☐	If the project utilizes an FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
☐	☐	Examination and review the project QAPP (and FSP, if used) to determine if additional project-specific data *review* requirements apply. Update this checklist to include all such items.
☐	☐	Examine project data, identifying errors in data entry, storage, calculation, reduction, transformation, or transcription.

Yes	No	
☐	☐	Ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment process. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.
☐	☐	Identify if all required nondirect measurement data (existing data) information *and supporting documentation*, as required by the project QAPP (and FSP, if used), have been received and are available for the verification and validation process.
☐	☐	Determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.
☐	☐	Ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP (and FSP, if used), have been received from the applicable laboratories.
☐	☐	Identify programming and/or software related errors, if applicable to the project.
☐	☐	Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *review* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.
☐	☐	Verify that a copy of this data review checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data review actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project manager shall consult the DEQ QMP and proceed accordingly.

Please list any additional comments below. Attach additional sheets as necessary.

DEQ QAPP/FSP Checklist—Data Verification

The individual assigned in the project QAPP/FSP to perform project **data verification** *shall complete and file this checklist in the appropriate project TRIM system files.* Project personnel are encouraged to expand this standard list, as project conditions warrant.

Printed Name of Staff Performing Data Verification	Date Completed
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

Check the following review boxes following completion of each listed task.

Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.

Yes	No	
☐	☐	Examine and review the project QAPP (and FSP, if used) to determine if additional project specific data *verification* requirements apply. Update this checklist to include all such items.
☐	☐	Verify that all data completeness criteria, as stated in the project QAPP (and FSP, if used), have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.
☐	☐	Verify that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP (and FSP, if used).
☐	☐	Verify that the required analytical methods, as listed in the project QAPP (and FSP, if used) correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.
☐	☐	Verify that QAPP (and FSP, if used) requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.
☐	☐	Verify that all supporting information and documentation for nondirect measurement data (existing data) meet the requirements of the QAPP (and FSP, if used). If not, identify any limitations or restriction on the use of such data.

Yes	No	
☐	☐	Verify that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
☐	☐	Verify that sample handling activities conform to QAPP (and FSP, if used) requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
☐	☐	Verify that data calculation and handling activities conform to QAPP (and FSP, if used) requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.
☐	☐	Verify that any remaining or unique project QAPP (and FSP, if used) or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.
☐	☐	Determine and document any limitations on the use of the project data.
☐	☐	Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *verification* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.
☐	☐	Verify that a copy of this data verification checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data verification actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

Please list any additional comments below. Attach additional sheets as necessary.

DEQ QAPP/FSP Checklist—Data Validation

The individual assigned in the project QAPP/FSP to perform project **data validation** *shall complete and file this checklist in the appropriate project TRIM system files.* Project personnel are encouraged to expand this standard list as project conditions warrant.

Printed Name of Staff Performing Data Validation	Date Completed
Project QAPP/FSP Title	QAPP/FSP TRIM Record #

Check the following review boxes following completion of each listed task.

Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.

Yes	No	
☐	☐	Verify that the approved current project QAPP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
☐	☐	If the project utilizes a FSP, verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the FSP is not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager.
☐	☐	Examine and review the project QAPP (and FSP, if used) to determine if additional project-specific data *validation* requirements apply. Update this checklist to include all such items.
☐	☐	Evaluate and examine all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
☐	☐	Review project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.

Yes	No	
☐	☐	Review the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.
☐	☐	Determine, when necessary and where possible, the reasons for any failure to meet methodological, procedural, or contractual requirements and evaluate the impact of such failure on the overall data.
☐	☐	Compare the project DQOs, as defined in the project QAPP (and FSP, if used), to the data obtained by the project to assess the adequacy of the data (new or existing) in relation to their intended use.
☐	☐	Determine the extent to which any nondirect measurement data (existing data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project?
☐	☐	Determine and document any limitations on the use of the project data.
☐	☐	Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.
☐	☐	Ensure that all deficiencies and/or conditions adverse to quality determined during the project data *validation* process have been communicated to project management and are listed on this checklist or attached for inclusion in the TRIM record system.
☐	☐	Verify that a copy of this data validation checklist has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional data validation actions may be required based on the checklist findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

Please list any additional comments below. Attach additional sheets as necessary.

DEQ QAPP/FSP Checklist—Annual QAO Project Audit

The individual assigned in the project QAPP/FSP as the project quality assurance officer (QAO) shall audit the project on at least an annual basis. The QAO *shall complete this checklist as part of the audit process and file the completed form in the appropriate project TRIM system files.* Project QAOs are encouraged to expand this standard list as project conditions warrant.

Printed Name of Staff Performing the QAO Audit _____ Date Completed _____

Project QAPP/FSP Title _____ QAPP/FSP TRIM Record # _____

Check the following review boxes following completion of each listed task.

Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.

Yes	No	
☐	☐	Verity that the approved current project QAPP (and FSP, if used), including a copy of the signed approval signature page, is currently filed in the TRIM system. Also, verify the project information for the QAPP (and FSP, if used) has been entered into the QAO project tracker found at TRIM record #2012AEB8. If the QAPP (and FSP, if used) are not filed in TRIM, or the QAO tracker is not current, immediately inform the DEQ QA manager. _____ _____ _____
☐	☐	Verify that the approved and current project documents, such as the project QAPP (and FSP, if used), SOPs, etc., are available to project staff and are in use per project requirements. _____ _____ _____
☐	☐	Determine through review and observation if the project has performed and documented project activities as described and required by the project QAPP (and FSP, if used) such that the needs of the data user are satisfied. _____ _____ _____
☐	☐	Determine if the project QAPP (and FSP, if used) adequately document and describe the actual project requirements such that the needs of the data user are satisfied. If necessary, in coordination with the project manager, initiate project document revision, review, and approval efforts in accordance with the DEQ QMP. _____ _____ _____

Yes	No	
☐	☐	Determine if the project analytical requirements are adequately met by the selected laboratory, including use of proper analytical methods and sufficient analytical data support documentation.
☐	☐	Determine if project sample handling activities are in compliance with the requirements of the project QAPP (and FSP, if used).
☐	☐	Determine if project field activities are in compliance with the requirements of the project QAPP (and FSP, if used).
☐	☐	Determine if all nondirect data acquisition associated with the project has been addressed and properly documented in the project QAPP (and FSP, if used).
☐	☐	Compare actual project documents available in the DEQ TRIM record system against the document filing requirements contained in the project QAPP (and FSP, if used). Identify existing deficiencies in the project TRIM system files, such as missing field note pages and missing chain-of-custody forms, and provide this information to the project manager for immediate resolution.
☐	☐	Ensure that all deficiencies and/or conditions adverse to quality determined during the project QAO audit process are listed on this checklist or attached for inclusion in the TRIM record system.
☐	☐	Verify that a copy of this annual QAO audit report has been provided to the project manager for deficiency resolution and placed in the project TRIM file system. Note that additional audit administrative actions may be required based on audit findings, such as a corrective action plan/reports, etc. The project QAO shall consult the DEQ QMP and proceed accordingly.

Please list any additional comments below. Attach additional sheets as necessary.