



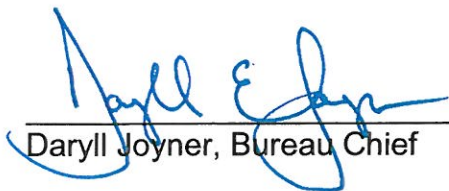
Quality Plan for the Standards and Assessment Section

Florida Department of Environmental Protection

July 1, 2011

Signature Page

The undersigned have read and understood this Quality Plan, are charged with managing and improving the quality system, and are responsible for ensuring that all staff properly execute the procedures discussed in the plan.



Darryl Joyner, Bureau Chief

5/11/11

Date



Russel Frydenborg, Program Administrator

5-5-11

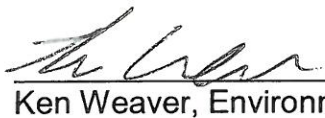
Date



Michael Blizzard, Environmental Administrator

5/5/11

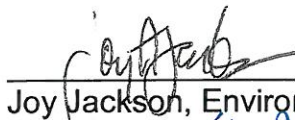
Date



Ken Weaver, Environmental Administrator

5/5/11

Date



Joy Jackson, Environmental Manager

5-5-11

Date



Michele Reliford, Quality Assurance Officer

05/05/2011

Date

1. Introduction

In order to execute the components of the DEP QA Directive, the Standards and Assessment Section (SAS) has developed a quality plan, the purpose of which is to ensure the implementation of a quality system. This document describes the steps we take to ensure the scientific and legal defensibility of environmental data we generate or use. It details the process of planning, training, execution, assessment and corrective action we undertake to ensure that environmental data meet our established quality criteria.

The Florida Department of Environmental Protection (FDEP) Quality Assurance (QA) program involves the implementation of a management system (planning, review, training, and assessment) to ensure that data collection, generation, interpretation, reporting, evaluation and archiving are of sufficient quality to support Department decisions. The effectiveness of our QA program is dependent upon the actions of all FDEP staff, from “front line” employees to management, meaning QA is a function distributed throughout our organization. One aspect of our program is to ensure that Department QA activities are carried out according to commitments made to the Environmental Protection Agency as enumerated in the FDEP Quality Assurance Management Plan (QAMP), Revision 6/24/09.

The FDEP Secretary is committed to implementation of the quality assurance requirements in the QAMP and as authorized at Section 403.0623, F.S., and Chapter 62-160, F.A.C. (FDEP QA Rule for water, waste and resources). It is the Secretary’s intent to carry out these obligations and requirements as described in the Department’s QA Directive (Directive 972, September 2009, at <http://www.dep.state.fl.us/admin/depdirs/directives.htm>).

2. Basic Elements of the SAS Quality Plan

We expect all staff to read, understand and follow the procedures and criteria as described in this plan, and to carry out their assigned responsibilities for effective utilization of our quality system. This Quality Plan explains both the process and criteria by which SAS’s quality system is managed. The plan is utilized as an instrument of internal communication to inform our staff of current and future quality assurance activities. It discusses how specific QA duties are assigned to responsible staff. We will revise our Quality Plan as needed, and will ensure the consistent application of procedures and criteria for the generation or use of our environmental data. The Quality Plan will also be used as a training document for new staff and as a reference for experienced personnel. The plan and its revisions also serve as an archival record of our formal quality system.

The elements of our plan are consistent with the Department’s QMP, Quality Assurance Directive, and QA Rule (Chapter 62-160, Florida Administrative Code, F.A.C.). In addition, we affirm that our quality system for all sampling activities, including field-meter testing, is consistent with DEP SOP FA 3300.

Sampling events are sometimes conducted jointly with Bureau of Laboratories (BOL) staff. SAS is part of the Bureau of Assessment and Restoration Support (BARS) and we utilize BOL facilities and equipment for sampling and field testing. Our plan addresses all activities associated with environmental sampling, field testing, and data review, including those activities associated with database construction and management. Our plan also addresses how decisions about data use are made based on data quality assessments.

2.1 Policy Statement

It is the Standards and Assessment Section's policy to:

- Use scientifically valid and legally defensible data for our decisions affecting protection of the environment, especially relating to water quality criteria development, and assessing Florida's water resources;
- Develop and implement the Quality System described in this document;
- Adaptively manage our Quality System to be consistent with provisions of the FDEP Quality Assurance Management Plan;
- Ensure that each individual is properly trained to execute their assigned functions;
- Implement procedures to evaluate the quality of the data we use and to implement corrective actions when data do not meet our Data Quality Objectives;
- Periodically audit the performance and record-keeping practices of data generators that provide data to the Department;
- Recommend data use based on the data quality objectives of a Department program and the results of a data audit or inquiry;
- Implement quality assurance procedures for the management of our data repositories; and
- Perform a yearly systematic assessment of our quality assurance activities, including any corrective actions, with the findings submitted to our Quality Assurance Officer.

3. Ethics

All employees of the FDEP Standards and Assessment Section are held to high professional ethical standards in the performance of their duties. All employees are required to read, understand and sign an 'Ethics Statement' attesting to their commitment to honesty and integrity in performance of their duties. In addition, all employees are required to attend an annual ethics training class. Improper, unethical or illegal actions will be dealt with according to the published Administrative Directives of FDEP.

4. Organization and Responsibilities

The SAS resides within the Division of Environmental Assessment and Restoration (DEAR), Bureau of Assessment and Restoration Support (BARS).

4.1 Staff Responsibilities

The SAS functions in several capacities to assist with FDEP priorities, including the development and maintenance of surface water quality standards (Chapters 62-302, 62-303, and 62-4, F.A.C.), overseeing FDEP's QA Program (including maintenance of Chapter 62-160, F.A.C., the QA Rule), directing FDEP's biological assessment program, and providing a wide variety of technical support such as conducting focused environmental studies, and training and auditing FDEP and external staff. Responsibilities for existing staff are as follows.

4.1.1 Water Quality Standards and Assessments Activities

Russ Frydenborg, Ken Weaver, Eric Shaw, Gary Payne, Brandon Moyer, and Janet Klemm perform the following duties:

- Maintain and revise FDEP water quality standards, including criteria, designated uses, and antidegradation policy, with departmental and intergovernmental coordination;
- Conduct triennial review of water quality standards;
- Coordinate Designated Use issues, classifications, and FDEP's antidegradation policy;
- Coordinate the review of Site Specific Alternative Criteria petitions; and
- Respond to petitions concerning Outstanding Florida Waters and Site Specific Alternative Criteria.

4.1.2 Quality Assurance Program Activities

Michael Bizzard, Nia Wellendorf, Michele Reliford, and Russ Frydenborg perform the following duties:

- Maintain the QA Rule, Chapter 62-160 F.A.C. and the FDEP Standard Operating Procedures (DEP-SOP-001/01 and DEP-SOP-002/01);
- Evaluate new technologies and methodologies proposed for incorporation into Department rules and procedures;
- Coordinate biological QA tasks for timely completion;
- Develop data quality planning and assessment criteria (Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs)) for regulatory and contractual data use;
- Conduct reviews and assist Department staff with the review of QA documents for contracts and grants;
- Conduct field and lab audits;
- Provide technical assistance to FDEP Programs;
- Coordinate implementation of the QA Directive through QA training and development of information materials;
- Coordinate with and assist FDEP QA Officers in the development of quality systems for FDEP programs and organizational work units;
- Provide technical training;
- Assist with special studies, SAS contract management and water quality standards development through support of quality assurance components;
- Administer the Department-wide QA program for water and waste (see duties off the FDEP Quality Assurance Officer)

4.1.2.1 Duties of the Standards and Assessment Section Quality Assurance Officer

Responsibilities of our section Quality Assurance Officer (QAO), Michele Reliford, include:

- Coordination of and participation in the quality evaluation of data used by the section;
- Oversight of staff performance of assigned QA functions;
- The QAO conducts systems audits of internal and external data generators (lab and field) and conducts sampling performance audits;
- The QAO also ensures that corrective actions are implemented for data non-conformance incidents as determined by evaluation of the data against our program's Data Quality Objectives (DQOs);
- Additionally, the QAO assists program managers in the development of the Quality System and other logistical aspects of its implementation, such as coordinating associated training needs; and

- Coordinates data reviews and documents all program QA activities, including training, audits and corrective actions and uses this information when assisting the FDEP QA Coordinator with compiling the FDEP QA Report to the Secretary.

4.1.2.2 Duties of DEP QA Coordinator

Michael Blizzard is FDEP's designated Quality Assurance Coordinator, as described in the Department's QAMP, and is responsible for quality assurance oversight of the FDEP water, waste and resource management programs, acting as the QA liaison for all FDEP organizational units managed under these programs. Those responsibilities include:

- Ensuring that the quality systems documented in the QAMP meet statutory, contractual and assistance agreement requirements for EPA-derived work;
- Development, implementation and continued operation of the Department's QA policies;
- Providing leadership for all quality issues;
- Providing training and technical assistance;
- Preparing and distributing the QAMP;
- Ensuring that each agency program has a program-specific quality plan;
- Coordinating the efforts of all program Quality Assurance Officers (QAOs) by holding regularly scheduled meetings;
- Providing specific guidance and training to the program QAOs;
- Independently evaluating the effectiveness of the Department's Quality System and initiating corrective actions where warranted;
- Coordinating the preparation of an annual QA report to the Secretary of the Department on all QA activities, including recommendations for improving the Department's Quality System; and
- Interacting with data providers, data consumers and with external parties concerning all FDEP quality assurance matters.

4.2.3 Special Projects Activities

Joy Jackson, Don Axelrad, Jeremy Johnson, Randy Snipes, Ashley O'Neal, Nia Wellendorf and Russ Frydenborg perform the following duties:

- Implement FDEP's bioassessment program;
- Coordinate and assist in the development and review of biological assessment methods and SOPs (e.g., Stream Condition Index (SCI), Lake Vegetation Index (LVI), algal assessment methods);
- Train and audit FDEP and external staff, focusing on biological assessment SOPs and issues;
- Establish habitat benchmark sites for QA purpose;
- Conduct taxonomic interlaboratory comparisons (round robins) of benthic macroinvertebrate data for FDEP laboratories;
- Assist in the development and review of water quality standards, including criteria, designated uses, and antidegradation policy;
- Coordinate, sample, and produce reports for directed studies (e.g., the Nutrient Gradient, Longitudinal and Benchmark Studies, Stressor Identification Study, and Springs Studies).;
- Conduct scientific reviews for FDEP programs (e.g., Minimum Flows and Levels program, Resource Conservation and Recovery Act program, Total Maximum Daily Load program);

- Support the FDEP Statewide Mercury TMDL Studies;
- Manage the FDEP Stressor Identification Study;
- Conduct interlaboratory comparisons (round robins) for mercury of FDEP and external laboratories;
- Provide technical support and manage studies on Everglades issues (sulfur, mercury, South Florida Environmental Report);
- Coordinate Environmental Education activities; and
- Assist with Data Interpretation and Usability analyses for FDEP programs and external programs and projects.

4.2.4 Support Activities for Sampling

SAS staff perform a number of activities in support of sampling efforts for FDEP projects and programs:

- Design sampling plans to meet project- and program-specific needs (Ken Weaver, Michael Blizzard, Joy Jackson, Eric Shaw, Gary Payne, Nia Wellendorf, Ashley O'Neal, Brandon Moyer, Jeremy Johnson, Randy Snipes, Michele Reliford, and Russ Frydenborg);
- Prepare QA plans and SOPs (Michael Blizzard, Nia Wellendorf, Michele Reliford, Joy Jackson, Jeremy Johnson, Randy Snipes, and Russ Frydenborg);
- Review procedures and methods for compliance with QA plans and requirements (Michael Blizzard, Nia Wellendorf, Michele Reliford, Joy Jackson, Ashley O'Neal, Jeremy Johnson, Randy Snipes, and Russ Frydenborg);
- Provide guidance for and process requests for use of alternative, new or modified sampling procedures (Michael Blizzard and Michele Reliford);
- Manage SAS field sampling, field-testing and associated support operations (Joy Jackson);
- Conduct field sampling, field-testing and associated support operations (Michael Blizzard, Nia Wellendorf, Michele Reliford, Joy Jackson, Jeremy Johnson, Randy Snipes, Ken Weaver, Ashley O'Neal, Brandon Moyer, Eric Shaw, Janet Klemm, and Russ Frydenborg).

4.2.5 Support Activities for Laboratory Analysis

SAS staff provide guidance for and process requests for use of alternative, new or modified lab methods (Michael Blizzard and Michele Reliford).

Our program staff routinely carry out duties involving data collection, data interpretation and technical analyses, and data usability evaluation, generating FDEP work products in a manner that ensures scientific defensibility and adherence to FDEP rules and policies.

The QA Officer receives assistance from properly trained and qualified staff, including Michael Blizzard, Joy Jackson, Nia Wellendorf, Jeremy Johnson, Randy Snipes, Michele Reliford, and Russ Frydenborg, on the following activities:

- Review proposed work for conformance with quality criteria;
- Review and evaluate data for appropriateness to the needed environmental decision;
- Interpret data for development or revision of water quality criteria;
- Interpret data for technical input to other FDEP Programs;
- Perform or review and check statistical calculations;
- Review documents for errors and completeness;
- Screen data for consistency with DQOs; and

- Provide feedback to the section QAO for improving the section's quality system.

Additionally, Michael Blizzard, Nia Wellendorf, Michele Reliford, and Russ Frydenborg answer public or external technical inquiries about data interpretation, approved procedures, suspected QA problems, site-specific issues, etc.

Our unit's management, Daryll Joyner, Russ Frydenborg, Ken Weaver, and Michael Blizzard, ensure that this quality system is fully operational within our program. Michele Reliford has been designated as our Quality Assurance Officer. These six individuals also evaluate the Data Quality Objectives and Data Quality Indicators found in Table 1 to ensure they meet our program's needs, and periodically evaluate the effectiveness of staff's data quality activities, including reviewing audit results. They evaluate corrective action policies and procedures to be implemented when data do not meet program DQOs. Our managers discuss audit results with the QAO, review the annual Quality Assurance Report to the Secretary, and discuss findings with the QAO.

5. Training

All personnel are properly trained to perform their duties. Supervisors periodically assess whether our staff performance conforms with the policies and procedures of our unit.

Our training procedures consist of:

- Ensuring all new field staff are familiar with the QA Rule requirements and the details involved with FDEP SOPs, including hands-on training with experienced staff;
- Education for specific QA functions, including performing audits and data screening. This is done for appropriate staff via meetings and hands-on training;
- Review of ethics policy with the QAO during meetings;
- Updating and reading the QAO page on the FDEP website; and
- Periodic refresher trainings or delivery of updated information, when needed.

Staff are evaluated by reviewing their performance to determine effectiveness of training. For example, field staff must be trained in biological assessment and habitat assessment procedures, and pass audits for those assessment procedures prior to their collection of the data. Similarly, new staff are observed by experienced staff during collection of water chemistry samples, field measurements, and other SOPs prior to allowing them to collect data unassisted. Senior staff review raw field data sheets, results of data analysis, and environmental and audit report generation and interpretation to determine that all staff are consistently performing according to expectations.

6. Sampling Design and Procedures

Successful implementation of our program relies on having valid data, which begins with proper study design and sampling. Studies are designed to answer a wide variety of environmental questions, and therefore, each study contains specific elements or objectives best suited for answering the question at hand. Studies could involve judgment sampling (sampling sites upstream and downstream of a suspected pollutant source or a Before-After-Control-Impact design), probabilistic sampling (selecting sites randomly along a stratified-random gradient), or other methods. Examples of bioassessment study objectives are found in "Sampling and Use of the Stream Condition Index (SCI) for Assessing Flowing Waters: A Primer" at:

http://www.dep.state.fl.us/labs/bars/sas/training/docs/sci_primer.pdf

For other examples, see Numeric Nutrient Criteria Development Plan at:
<http://www.dep.state.fl.us/water/wqssp/nutrients/>

7. Quality Assurance Program Procedures

7.1 Development of the QA Rule, Chapter 62-160 F.A.C. and the DEP Standard Operating Procedures (DEP-SOP-001/01 and DEP-SOP-002/01)

SAS staff periodically update the QA Rule and DEP SOPs to ensure that they accurately reflect ongoing technical and scientific advancements and are practical and suitable for carrying out FDEP's mission.

8. Data Review Procedures

SAS staff understand the need to evaluate the quality and usefulness of environmental data prior to making decisions. We review data to determine its usability for determination of compliance with permits or rules and as input for water quality standards development. These procedures are based on our established DQOs and DQIs, and incorporate the concepts and criteria found in FDEP's "Process for Assessing Data Usability", DEP-EA-001/07". See Table 1 for a list of routine DQOs and DQIs that are reviewed via the procedures in DEP-EA-001/07. Staff evaluate data using the Standards and Assessment DQOs and DQIs and implement corrective actions as directed by the QAO.

8.1 Data Quality Review for Water Quality Criterion Development

Water quality criteria are the ultimate threshold against which monitoring data will be assessed for Clean Water Act purposes. Therefore, water quality standards and criteria derivation require stringent quality assurance. Data used to develop water quality criteria for the protection of aquatic life from acute or chronic toxicity endpoints are reviewed based on the requirements and procedures in Stephan *et al.*, 1985. Water quality data used to access or derive numeric criteria for other parameters are reviewed to assure the data used accurately represent ambient conditions following the procedures in DEP-EA-001/07. Additionally, data and associated qualifiers are reviewed and data are handled as follows:

- Reject results with 'Fatal' Qualifier codes (J, K, N, O, Q, V, Y, or ?) or equivalent laboratory comments
- Results reported as below the detection limit and flagged for blank contamination (e.g., V qualifier code) will not be rejected
- Results reported as less than the method detection limit (e.g., U qualifier code) are replaced with either half of the reported detection limit or values based on other scientifically defensible approaches. Zeros are not used to represent values below the MDL.

9. Procedures for Conducting Audits and Managing Corrective Actions Resulting from Audits

Audits provide objective feedback concerning the effectiveness of a program's quality system, and may identify areas in need of improvement. The SAS performs the following audit and follow-up activities as discussed below.

9.1 Internal Auditing

Internal audits are primarily conducted annually for sampling activities performed by SAS staff and comprise the various evaluations of each individual's skill and knowledge of the techniques and criteria appropriate for each type of sampling or field-testing procedure for which the individual has been qualified.

9.1.1 Biological Sampling and Testing (Field Assessments)

SAS personnel are audited according to the procedures found in DEP SOP FA 4310 in order to be qualified to conduct sampling and field assessment activities for the Stream Condition Index (SCI), BioRecon and Lake Vegetation Index (LVI). In addition, after receiving training according to DEP SOP FA 5720, staff are required to participate in periodic peer group evaluations of their ability to perform Habitat Assessments (DEP SOP FT 3000).

9.1.2 Chemical and Bacteriological Sampling (Water Quality Sampling) and Testing (Field Meter Analyses)

After familiarization with the appropriate DEP SOPs and sufficient field training, SAS staff are audited for water quality sampling and field testing according to audit checklists designed for each of the applicable DEP SOPs. The current version of these checklists is in Excel format and is stored in the section's common server directory under Audits\Cklists. Generic versions of these checklists are found in the appendix to DEP SOP FA 1000 and are also available to staff and the public via links on the QA Officer Resources webpage.

9.1.3 Procedures for Conducting and Documenting Audits, Including Corrective Actions

9.1.3.1 Audit Evaluations, Scoring and Archiving

The results of audits for individuals evaluated for SCI and BioRecon sampling are scored according to DEP SOP FA 4310 and archived. The results for sampling teams evaluated for the LVI procedures are scored according to DEP SOP FA 4330 and archived. Audits of water quality sampling and field testing are archived.

Habitat Assessment (FT 3000) evaluations are periodically conducted on a peer group basis and are based upon the central tendency of the established expert group. These results are also scored and archived.

9.1.3.2 Corrective Action Procedures

When deficiencies arise with respect to the SCI, LVI, HA, WQ Sampling, Field-Meter Testing, or Documentation, the root cause of the issue is identified and corrective action, such as additional training or testing, is implemented.

9.2 Audits Conducted on Behalf of Other DEP Programs

The SAS conducts sampling-performance, field-testing and data records audits at the request of FDEP programs. Occasionally, joint laboratory audits are conducted with the Florida Department of Health (DOH) Environmental Laboratory Certification Program (ELCP).

9.2.1 Procedure for Preparing for and Conducting Audits for Other DEP Programs

After an initial request and discussions, SAS staff typically obtain pertinent information about sampling sites, sample lists, dates and the identities of the organizations involved in the audit. Michael Blizzard, as the DEP QA coordinator, is the lead auditor and organizes these audit preparations or delegates this task to other SAS staff.

9.2.1.2 Sampling Performance and Field-Testing Audits

Based upon staff availability, SAS conducts audits upon the request of FDEP Programs and compiles audit reports. Sampling teams to be audited are identified through contacts with the team leader or other managers. Details about the planned audit date, meet-up logistics and audit scope are typically arranged via email.

10. Contract Management

10.1 Contracts Managed by the Standards and Assessment Section

Our program ensures that the FDEP contracts that we administer are properly developed and managed to assure appropriate data quality. Contract managers assure that the work is properly planned and executed, relevant to FDEP decisions, and consistent with the FDEP QA Rule and FDEP SOPs.

10.1.1 Development of contract language and quality assurance requirements prior to contract execution

Specifically, we ensure that contract development and review includes the provisions of the QA rule and DEP-QA-002/02. Standard templates are provided to contract managers for quality assurance requirements. These templates may be edited to customize requirements to the scope of contract work. The completed contract and QA template are reviewed by the DEP QA Coordinator or designated work unit QA Officer prior to execution of the contract.

10.2 Support Activities for Contracts Managed by Other Department Programs

SAS provides education and “stock” QA language to FDEP contract managers to assist them in with data quality issues. However, FDEP contract managers bear the obligation of assuring that the work is properly planned and executed, relevant to FDEP decisions, and consistent with the FDEP QA Rule and FDEP SOPs.

11. Documentation

SAS performs the following record-keeping procedures for the indicated activities to ensure appropriate documentation.

11.1 Sampling and Field Testing Documentation

SAS staff follow sampling and field-testing documentation requirements in the QA Rule and DEP SOP FD 1000, as well as any additional documentation specified in the applicable procedures found in DEP-SOP-001/01.

11.2 Data Review

SAS conducts in-house peer review of statistical analyses, calculations, and data interpretation and is currently developing documentation procedures for these activities. This “team approach” provides

for multiple staff and management review to ensure accuracy and defensibility of any decisions associated with the data.

11.3 Data Archiving

SAS staff who enter data into databases have a second individual check the accuracy of the entries and initial the raw data sheet (e.g., SBIO entries).

11.4 Document Control and Records Maintenance

SAS posts results of all reports (audits, environmental assessment studies, etc.) on the following website:

<http://www.dep.state.fl.us/labs/cgi-bin/reports/search.asp>

Support files for audits are maintained in the Section's central filing system, with electronic records stored on the common drive.

12. Compilation of the Annual Quality Assurance Report to the FDEP Secretary

To provide the Secretary with information regarding FDEP's ongoing QA efforts, our unit will prepare a SAS-specific QA report that will be compiled with the Department-wide annual QA report. Both the SAS and Department-wide QA reports describe the types and outcomes of QA activities conducted each year.

13. References

FDEP Standard Operating Procedures for Field Activities (DEP-SOP-001/01), March 31, 3008

FDEP Standard Operating Procedures for Laboratory Activities (DEP-SOP-002/01), March 31, 3008

Stephan, C.E., D.I. Mount, D.J. Hansen, J.H. Gentile, G.A. Chapman, and W.A. Brungs, 1985, Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, U.S. Environmental Protection Agency, Office of Research and Development, Environmental Research Laboratories, Duluth MN, Narragansett R.I., and Corvallis, OR.

Table 1. Default Data Quality Objectives and Data Quality Indicators for the Standards And Assessment Section. DQOs and DQIs are adjusted as necessary to meet the requirements and objectives of the FDEP Projects and Programs we are assisting.

Data Quality Indicator	Analyte, Parameter or Assessment Test	Data Quality Objective
Laboratory Control Spike (LCS) or Laboratory Fortified Blank (LFB) Concentration	Ammonium	≤ 160 µg/L
LCS or LFB	Calcium (Ca)	≤ 0.4 mg/L
LCS or LFB	Hardness (Ca + Mg calculation method)	Note 8
LCS or LFB	Hardness (titration method)	≤ 50 mg/L
LCS or LFB	Magnesium (Mg)	≤ 0.16 mg/L
LCS or LFB	Metals	See Note 2
LCS or LFB	Other Nutrients, including Nitrate, Nitrite, Nitrate + Nitrite, Orthophosphate, Total Phosphorus (TP)	≤ 80 µg/L
LCS or LFB Percent Recovery (%R)	Hardness (Ca + Mg calculation method)	See Note 8
LCS or LFB Percent Recovery (%R)	Hardness (titration method)	See Note 1
LCS or LFB Percent Recovery (%R)	Metals, including Ca, Mg	85% -115%
LCS or LFB Percent Recovery (%R)	Nutrients, including Ammonium, Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TKN, TP; and TOC	80% - 120%
LCS or LFB Percent Recovery (%R)	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, Polycyclic Aromatic Hydrocarbons (PAHs), Phthalate Esters, Polychlorinated Biphenyls (PCBs), Oils & Greases	See Note 4
Matrix Spike (MS) %R	Hardness (Ca + Mg calculation method)	See Note 8
Matrix Spike (MS) %R	Hardness (titration method)	See Note 1
Precision (Relative Percent Difference, Percent Relative Standard Deviation or Other) for Duplicate or Replicate (LCS, LFB, MS, Quality Control Check Sample or Sample Analyses)	Ammonium, BOD (Biochemical Oxygen Demand), Chlorophyll, Color, Hardness (titration method), Metals (including Ca, Mg), Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TDS (Total Dissolved Solids), TKN, TP, TSS (Total Suspended Solids), TOC, Turbidity	≤ 20%
Precision for Duplicate or Replicate	Bacteriological Quality (Fecal Coliform Bacteria)	See Note 5
Precision for Duplicate or Replicate	Hardness (Ca + Mg calculation method)	See Note 8
Precision for Duplicate or Replicate	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs, Oils & Greases	See Note 4
Surrogate Spike Percent Recovery	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs, Oils & Greases	See Note 4
Calibration Curve Linearity Evaluation	Ammonium, Metals (including Ca, Mg), Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TKN, TP, TOC	See Note 6

Data Quality Indicator	Analyte, Parameter or Assessment Test	Data Quality Objective
Calibration Curve Linearity Evaluation	Hardness (Ca + Mg calculation method)	Note 8
Calibration Curve Linearity Evaluation	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs, Oils & Greases	Note 14
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	Ammonium, Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TKN, TP, TOC	≥ 3
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	Metals (including Ca, Mg)	Note 13
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	Color	See Note 7
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	pH, Specific Conductance, Turbidity	See Note 15
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	Hardness (Ca + Mg calculation method)	Note 8
Minimum Number of Calibration Standards for Calibration Curve or Calibration Verification	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs	Note 14
For the following analytes, at least one calibration verification standard is from a second source as indicated in the applicable NELAC Quality Systems standard for continuing calibration verification	Ammonium, Hardness by Ca + Mg calculation method (see Note 8), Metals (including Ca, Mg), Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TKN, TP, TOC, Semi-volatile or Extractable Organic Compounds (including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs)	N/A
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Ammonium, Nitrate, Nitrite, Nitrate+Nitrite, Oils & Greases, Orthophosphate, TKN, TP, TOC	90% - 110%
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Metals (including Ca, Mg)	Note 10
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Conductance, Specific	95% - 105%
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Dissolved Oxygen	See Note 9
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Hardness (Ca + Mg calculation method)	See Note 8
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	pH	See Note 11

Data Quality Indicator	Analyte, Parameter or Assessment Test	Data Quality Objective
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Turbidity	See Note 12
Calibration Verification Standard Recovery or Other Verification Acceptance Criteria	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs	See Note 14
Laboratory Method Blank or Other Analytical Blank Results shall be < 10% of the associated sample results in the preparation batch or analytical sequence	Ammonium, Chlorophyll, Color, Hardness by Ca + Mg calculation method (see Note 8), Hardness (titration method), Metals (including Ca, Mg), Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TDS (Total Dissolved Solids), TKN, TP, TOC, Semi-volatile or Extractable Organic Compounds (including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs), Oils & Greases, TSS (Total Suspended Solids)	N/A
Field Quality Control Blank (Field Blank, Equipment Blank or Trip Blank) Results shall be < 10% of the associated sample results associated with the sample set or sampling event	Ammonium, Chlorophyll, Hardness by Ca + Mg calculation method (see Note 8), Metals (including Ca, Mg), Nitrate, Nitrite, Nitrate+Nitrite, Orthophosphate, TKN, TP, TOC, Semi-volatile or Extractable Organic Compounds (including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, PAHs, Phthalate Esters, PCBs), Oils & Greases	N/A
Target for Maximum Reported PQL	Ammonium	≤ 80 µg/L
Target for Maximum Reported PQL	Bacteriological Quality (Fecal Coliform Bacteria)	≤ 2 CFU/100 mL
Target for Maximum Reported PQL	BOD (Biochemical Oxygen Demand)	≤ 2 mg/L
Target for Maximum Reported PQL	Calcium	≤ 0.2 mg/L
Target for Maximum Reported PQL	Chlorophyll	≤ 3 µg/L
Target for Maximum Reported PQL	Conductance, Specific	1 µS/cm
Target for Maximum Reported PQL	Dissolved Oxygen	0.1 mg/L
Target for Maximum Reported PQL	Hardness (titration method)	≤ 50 mg/L
Target for Maximum Reported PQL	Hardness (Ca + Mg calculation method)	≤ 50 mg/L
Target for Maximum Reported PQL	Magnesium	≤ 0.08 mg/L
Target for Maximum Reported PQL	Metals	Note 16
Target for Maximum Reported PQL	Other Nutrients, including Nitrate, Nitrite, Nitrate + Nitrite, Orthophosphate, Total Phosphorus (TP)	≤40 µg/L
Target for Maximum Reported PQL	pH	0.1 Std pH Unit
Target for Maximum Reported PQL	TKN (Total Kjeldahl Nitrogen)	≤ 400 µg/L
Target for Maximum Reported PQL	Turbidity	1 NTU

Data Quality Indicator	Analyte, Parameter or Assessment Test	Data Quality Objective
Target for Maximum Reported PQL	Semi-volatile (Extractable) Organic Compounds, including Pesticides, Herbicides, Phenolic Compounds, Chlorinated Phenols, Chlorinated Cresols, Polycyclic Aromatic Hydrocarbons (PAHs), Phthalate Esters, Polychlorinated Biphenyls (PCBs), Oils & Greases, Color, Total Organic Carbon (TOC), TSS (Total Suspended Solids), TDS (Total Dissolved Solids)	See Note 17
Biological Analyses	Stream Condition Index, Lake Vegetation Index, Stream Periphyton sampling, Habitat Assessment, Biological Integrity Assessment, Lake Condition Index, Rapid Periphyton Survey and all other biologically related assessments.	See Note 18

Notes for Table 1.

Note 1 – Laboratory-generated control limits apply.

Note 2 - The usability of the LCS or LFB concentration for fresh water metals shall be evaluated based on the relevant hardness value and applicable water quality standard in 62-302.530, or for marine waters, the LCS or LFB concentration shall be evaluated based on the applicable water quality standard in 62-302.530, except that the provisions for an alternative PQL per 62-4.246(4) shall be used as the basis of evaluation in considering the lowest achievable concentration factor for the LCS or LFB, if necessary because of analytical technology limitations, or where a numerical water quality standard does not apply. In any case, the LCS or LFB target concentration shall be $\leq 2X$ the relevant concentration derived from the above criteria.

Note 3 - The usability of the LCS or LFB concentration for this analyte shall be evaluated based on the applicable water quality standard in 62-302.530, except that the provisions for an alternative PQL per 62-4.246(4) shall be used as the basis of evaluation in considering the lowest achievable concentration factor for the LCS or LFB, if necessary because of analytical technology limitations, or where a numerical water quality standard does not apply. In any case, the LCS or LFB target concentration shall be $\leq 2X$ the relevant concentration derived from the above criteria.

Note 4 - Laboratory-generated or method-specified control limits shall be used to evaluate the Data Quality Indicator, as applicable per any method instructions.

Note 5 – The control limits generated by the laboratory using the procedure in Standard Methods, Method 9020B, shall be used to evaluate method precision.

Note 6 - The correlation coefficient for the linear regression of the calibration curve data must be ≥ 0.995 . Non-linear regressions must have a coefficient of determination of ≥ 0.99 , using the appropriate number of standards for the curve.

Note 7 - The approved method requires a series of 12 standards. Fewer standards may be acceptable if the sample results fall within the PCU range of the standards used for the visual comparison analysis.

Note 8 - The DQIs and DQOs for the individual measurements of Ca and Mg apply.

Note 9 - Calibration verifications for dissolved oxygen must be within ± 0.3 mg/L of the standard saturation value for the measured temperature, as prescribed in DEP SOP FT 1500.

Note 10 - Calibration verifications for ICP analyses must be with 95% - 105%. Analyses by other techniques must be within 90% - 110%.

Note 11 - Calibration verifications for pH must be within ± 0.2 standard pH units of the measured buffer value.

Note 12 - Calibration verifications for turbidity must be within the limits for the applicable NTU ranges as prescribed in DEP SOP FT 1600.

Note 13 - Flame or furnace: 4 standards; ICP-ES or ICP-MS: calibration blank and high standard; Cold vapor AA or Fluorescence (Hg): 5 standards and blank.

Note 14 - Method requirements and options for evaluation of the calibration curve shall apply. The number of standards used for the curve shall be as specified in the approved method. If the method does not specify the number of standards to use to construct the calibration curve, a minimum of 2 calibration standards and a calibration blank shall be used. The method requirements and options shall be used for all calibration verifications.

Note 15 - A minimum of 2 calibration standards shall be used to calibrate or verify the instrument per the applicable DEP SOP for the test, such that the associated sample results are quantitatively bracketed by the concentrations of the calibration standards.

Note 16 - The usability of the reported PQL concentration for fresh water metals shall be evaluated based on the relevant hardness value and applicable water quality standard in 62-302.530, or for marine waters, the reported PQL concentration shall be evaluated based on the applicable water quality standard in 62-302.530, except that the provisions for an alternative PQL per 62-4.246(4) shall be used as the basis of evaluation in considering the lowest achievable PQL, if necessary because of analytical technology limitations, or where a numerical water quality standard does not apply.

Note 17 - The usability of the reported PQL concentration shall be evaluated based on the applicable water quality standard in 62-302.530, except that the provisions for an alternative PQL per 62-4.246(4) shall be used as the basis of evaluation in considering the lowest achievable PQL, if necessary because of analytical technology limitations, or where a numerical water quality standard does not apply.

Note 18 - All biology lab and field procedures, including quality assurance requirements, are found in DEP SOPs FA 1000, FS 7000, FT 3000, LQ 1000, and LT 7000. <http://www.dep.state.fl.us/labs/qa/sops.htm>

