QUALITY MANAGEMENT PLAN IDENTIFICATION FORM

Document Title:	**Quality Management Plan**
Organization Title:	Delaware River Basin Commission
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Plan Coverage: This Quality Management Plan addresses the quality assurance activities of the Delaware River Basin Commission.

Concurrence:

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Title Quality Assurance Officer
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Approved by US Environmental Protection Agency, Region III

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QUALITY MANAGEMENT PLAN

DELAWARE RIVER BASIN COMISSION
WEST TRENTON, NEW JERSEY 08628

December 2011

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INTRODUCTION

Following federal government regulations (40 CFR 30, 31, and 35), DRBC has established a system for managing its data collecting, analysis, and storage activities that assures DRBC data will meet the level of quality that is appropriate for the purpose the data has been obtained. This Quality Management Plan provides the framework used by the DRBC in implementing its data quality system in accordance with, *EPA Requirements for Quality Management Plans*, EPA QA/R-2, Final, March 2001.

In managing the water resources of the Delaware River Basin, the Delaware River Basin Commission (DRBC) is strongly committed to appropriate quality assurance (QA) practices in the course of collecting and processing environmental data. The DRBC has developed and integrated quality control (QC) practices into all monitoring and measurement activities. These QC practices are specifically designed to generate and process data of known and appropriate quality. The purpose of this document is to establish DRBC's commitment to the application of these QC practices. Further, it ensures that all monitoring and measurement activities funded by EPA will be conducted in accordance with EPA's monitoring and QA requirements. This document describes the system and management structure DRBC uses to implement the collection of reliable and valid environmental data.

The goal of the Commission QA program is to ensure that all environmental data obtained will be scientifically valid, defensible, and of known and acceptable precision and accuracy. This goal will be achieved by ensuring that adequate QA steps and procedures are used from initial study planning through data usage.

Quality Assurance Policy

It is the policy of the Commission that:

(a) All environmental data generated will be of known and acceptable quality. The quality of the data and the associated level of effort of required QA activities will meet the needs of each program's intended use(s) of the data. The data quality information developed will be documented and available upon reasonable notice.

(b) The intended use(s) of the data (and associated level of needed data quality) will be defined before the data collection effort begins, and will take into account the needs of secondary users, as appropriate. The intended data uses, level of quality, specific QA activities, and data criteria needed to meet the data quality needs of these uses is described in each monitoring activity's QA Project Plan.

(c) An acceptable program of QA activities is developed and implemented at the onset of each data collection effort to help ensure that the necessary level of data quality is achieved.

(d) All Commission monitoring activities ensure that acceptable QA requirements are included and implemented in all applicable extramural procurements funded by EPA.

These will be primarily with state agencies that must meet EPA quality assurance requirements under their own programs.

(e) Each program or project, which generates environmental data, will have a Quality Assurance Plan following EPA's *Requirements for Quality Assurance Project Plans*, EPA QA/R-5, March 2001. Each Project Plan will demonstrate that the project has been designed to meet EPA quality assurance requirements. Adequate resources will be provided to support the quality assurance effort.

(f) Each project will designate a person who is responsible for QA activities for the project called the Project Coordinator. The coordinator will be responsible for preparing and maintaining documentation of the QA project plan and any subsequent revisions, and for maintaining communication with EPA QA staff and DRBC management.

This Quality Management Plan recognizes that a number of Commissions monitoring activities will be carried out under contract or agreement with the Commission. The Commission includes a specific provision in these contracts/agreements for monitoring services that all contractors adhere to EPA quality assurance requirements. Contractors generally will be agencies of the signatory parties to the Delaware River Basin Compact, which must satisfy EPA quality assurance requirements under their own programs. For each Commission program to be carried out by state contracting agencies, the Commission will develop a quality assurance project plan that will cite the applicable State Quality Management Plan. Quality assurance requirements will be adequately addressed in the appropriate contractor quality assurance plans. Commission quality assurance project plans will therefore be directed primarily to those issues that are unique to the specific project and to those activities performed by the Commission.

The QA Officer and QA contact will review state Quality Assurance Program Plans and applicable State Quality Assurance Project Plans to assure that they are consistent with the applicable Commission water quality data generating programs. Problems, if any, will be discussed with the state agencies/contractors and will be resolved as appropriate.

MANAGEMENT AND ORGANIZATION

For each project that generates water quality data, a Commission staff member responsible for carrying out the project will be designated as the Quality Assurance Coordinator. That person is responsible for preparation of the QA project plan for EPA funded projects. Oversight of delegated, contracted, or other extramural programs is specified in the QA project plans. Coordination of QA and QC activities among organizations is specified in the QA project plans. The QA Officer approves all QA project plans. On matters pertaining to quality of the monitoring program, the Quality Assurance Coordinators report to the Quality Assurance Officer.

The commission staff member responsible for preparation and updating of the Quality Management Plan is designated as the Quality Assurance Contact with EPA. That person will transmit information from EPA to the Project Coordinators as necessary and appropriate including when physical changes in the organization and/or changes in policy occur. Quality Assurance Coordinators are encouraged to work directly with EPA QA staff on QA issues specific to their project. Project Coordinators are encouraged to confer with each other and with the program Quality Assurance Contact in order to help ensure the dissemination of QA information throughout DRBC. The organization for quality assurance management at the DRBC is presented in Table 1.

Responsibilities of the QA Officer, QA Contact and Project Coordinators

(a) The QA Officer supervises the Project Coordinators and is responsible for assuring that the Coordinators fulfill their QA responsibilities.

(b) The Project Coordinators are responsible for and will oversee all aspects of all QA activities for their projects. They will keep the QA Officer and the EPA Regional Quality Assurance Officer informed of QA needs problems, and overall status for their projects. The Project Coordinators will also maintain lines of communication with upper management/contractors to ensure that QA requirements are implemented throughout the entire environmental monitoring project.

(c) The program QA Contact will be the official point of contact for QA matters and will coordinate for the Commission with the EPA.

(d) The Project Coordinators will be responsible for identifying and responding to QA needs, problems, and requests for their projects, and will obtain technical assistance from EPA III's Quality Assurance Office as necessary. The Project Coordinators are responsible for preparation of the QA project plans, which must be approved by the QA Officer.

QUALITY SYSTEM AND DESCRIPTION

The Quality Management Plan provides the framework used by the DRBC in implementing its quality system. Systematic planning is conducted as part of the Commission's Annual Work Plan and through development of the yearly Section 106 grant application process. The Annual Work Plan is part of the Commission's Water Resources Program, a five year planning document required by the Delaware River Basin Compact. The components of both the Water Resources Program and Annual Work Plan are developed by the staff and management of the DRBC with technical advice from advisory committees of the Commission including the Water Quality Advisory Committee and the Toxics Advisory Committee.

Each monitoring project in the Annual Work Plan has a QA project plan (QAPP), which must be approved by the QA Officer. The elements of an acceptable QAPP are outlined in EPA Requirements for QA Project Plans (QA/R-5) EPA/240/B-01/003, March 2001 . The specific requirements and level(s) of effort applicable to these QA elements will be described in the QA Project Plans that will be prepared for each monitoring program with EPA review of QA Project Plans for EPA funded projects. An environmental data operation for an EPA funded project cannot begin until there is an approved QA Project Plan or equivalent. QA Project Plans include the following:

- Description of project planning, implementation and assessment steps.
- Identification of project personnel, scientific experts and contactors.
- Description of project goal, objectives and questions/issues to be addressed.
- Project schedule.
- Type and quantity of data needed to support the project objectives.
- Performance requirements and QA/QC activities to assess performance criteria.
- Description of sampling procedures and data collection.
- Description of field QA/QC samples (trip blanks, field and rinsate blanks) required.
- Description of laboratory QA/QC samples (method blanks, lab duplicates, matrix spikes, and laboratory control sample) required (generally that required by the analytical method specified).
- Description of data analysis, evaluation and assessment.
- Process for evaluating and qualifying previously collected data or secondary information used in the project, if applicable.
- QA project plans are revised or amended as needed to reflect significant alterations (e.g., changes in study design, sampling, or data analysis). Revisions and amendments in EPA funded projects will be reviewed by EPA staff.

The quality of all data must be analyzed, evaluated and assessed before, during, and after it is generated in order to ensure that it is satisfying the intended data user's needs and QA Project Plan requirements. This includes any previously collected data and data from secondary sources. Where data or information used is obtained from other federal or state agencies such as flow data from the U.S. Geological Survey or tide data from NOAA, the quality assurance programs of these agencies are assumed to have validated the reported data. The assessment of the data includes five basic aspects:

- Accuracy - the accuracy of the data will be determined and its suitability for its intended use validated.
- Precision - the precision of the data will be determined and its suitability for its intended use validated.
- Completeness - the amount of data will be compared to the minimum requirements for the intended use.
- Representativeness - the extent to which the data reflects actual conditions at the sampling locations will be determined based on the original study design and the sampling methods, analytical methods, etc., that were used.
- Comparability - the extent to which the data can be compared to data from other sites/studies

Following approval of a plan, staff are assigned to the Project Coordinator to complete the sampling objectives. Project Coordinators are authorized to make adjustments in the field where necessary to achieve the project objectives, and are responsible for documenting such modifications as amendments to the QA Project Plan. Data assessment techniques are developed by the Project Coordinator in consultation with staff of the Modeling, Monitoring and Assessment Branch (MM&A), and approved by their supervisor. All data collected during a project are required to be stored in an electronic data base. The principal data base for project data storage is WQX, but other data bases include New Jersey's Water Quality Data Exchange (NJWQDE) and Commission Access data bases. Where required, project reports are prepared by the Project Coordinators and include assessments of data quality and limitations following the specifications of the QAPP. Project reports are reviewed by the section supervisor and branch manager prior to finalization. Reports are placed on the Commission's website for public access, and Project Coordinators may be requested to update the appropriate Commission advisory committees with the findings of the project.

The QMP will be updated whenever necessary and formally reviewed at least annually by the Quality Assurance Contact, with the approval of a QA officer. EPA III will be informed of any changes. The entire QMP will be re-submitted to EPA III for review and approval every 5 years.

The quality system is implemented through the QMP, QA project plans and SOPs.

PERSONNEL QUALIFICATIONS AND TRAINING

The monitoring staff of the Commission consists of environmental engineers, aquatic biologists, geologists, and environmental toxicologists. These staff have the appropriate education, experience and certifications in water resource management. All personnel involved in monitoring activities will have the necessary education, training, and experience in quality assurance issues to implement the Commissions' Quality Management Plan. Project Coordinators are required to follow the EPA guidance (EPA QA/G-5) for preparing QAPPs (U.S. EPA, 2002). Prior to participation in fieldwork, staff are also required to document that they have read the DRBC field safety manual. Prior to participation in an EPA funded project, staff are required to read and understand the applicable QA project plan and associated SOPs. Identification of needed staff training is the ongoing responsibility of section supervisors and the QA officer.

Training needs are identified during the annual performance appraisal process conducted by DRBC management.

Temporary employees are required to read and understand both the DRBC Field Safety Manual and applicable QAPPs and SOPs. In addition, Project Coordinators shall ensure that field crews are led by experienced staff scientists/engineers or by temporary staff knowledgeable of the sampling techniques and QA requirements of the project.

PROCUREMENT OF ITEMS AND SERVICES

Unless a non-competitive procurement of services is specifically authorized by the Commission, the DRBC procures field and analytical services through requests for proposals (RFPs) that specify data quality objectives and quality criteria, such as the use of state certified laboratories, to meet the needs of the QA project plan. The Commission's Chief Administrative Officer (CAO) is responsible for the development and issuance of each RFP. Technical staff provide the specifications for the services to be provided to the CAO for use in the RFP. The COA receives proposals submitted in accordance with the RFP, and arranges for the technical review of each proposal. The CAO documents the receipt and review of the proposals, and opens the sealed bids. A final recommendation is prepared for the Executive Director who forwards the final recommendation to the Commission for its approval.

Services procured through this competitive bid process are specified in agreements, contracts and/or purchase orders that list specific requirements such as project-specific quality assurance requirements and electronic data deliverables (EDDs). Extramural organizations must provide objective evidence (e.g., quality manual) of conforming to the specifications of the American National Standard ANSI/ASQC E4-1994. The CAO is responsible for ensuring that EPA extramural agreement policies are satisfied in all agreements and contracts.

The Delaware River Basin Compact specifies that the Commission use the services of the parties signatory to the Compact, where possible. As such, state environmental, fish and wildlife and health agencies (e.g., NJDEP, DEDNREC) are utilized under non-competitive agreements. State agencies under contract to the Commission must meet EPA requirements for adequate facilities, equipment, and services. Laboratories are all certified for wastewater and drinking water under EPA certification programs. The Commission may also rely on the inspections and audits that EPA performs. Commission staff will review state quality assurance status reports. Problems, if any, will be discussed with the state(s) and resolved, as appropriate. This will assure that these tasks are accomplished without unnecessary duplication. If other than state agencies are contracted to carry out Commission monitoring work; the contractor will be required to demonstrate compliance with EPA requirements for adequate facilities, equipment, and services. Proof of state certification, where appropriate, will be accepted as satisfaction of this requirement. Analytical laboratories used that are not state certified may be evaluated through document review and/or site visits by the Project Coordinator and QA officer.

For data collecting activities carried out by the Commission directly, the Commission will utilize laboratory facilities, monitoring equipment and procedures that will produce data that will meet or exceed the quality that is specified in QA project plans.

EPA requires the states to submit quality assurance status reports to EPA each year. State agencies under contract will be requested to provide copies of these reports to the Commission. Commission staff will review these reports. Problems, if any, will be discussed with the states, and will be resolved as appropriate.

For projects to be carried out by the states or other extramural agreements under contract to the Commission, the Commission may rely on audits conducted by the contracting states, contractors and EPA. For projects carried out by Commission staff, audit procedures will be addressed in the QA project plans. The Project Coordinator is responsible for assessing the quality of data submitted by the contractor to ensure that it is satisfying the data quality objectives and QA/QC requirements stated in the QAPP.

DOCUMENTS AND RECORDS

Quality assurance documents are prepared by DRBC staff, typically the Project Coordinator in the case of QAPPs. The Quality Management Plan is prepared by DRBC staff under the direction of the Manager, Modeling, Monitoring & Assessment Branch. QA documents may also be reviewed by the section supervisors in the branch. QA documents are reviewed and approved by the QA Officer. The Commission's QMP and all QAPPS for EPA funded projects are transmitted to EPA for review, comment and approval by EPA Regional QA staff.

Quality related documents are stored by the Modeling, Monitoring and Assessment (MMA) Branch secretary and tracked by version number and revision date. Retention times specified in the DRBC Records Retention and Disposition Schedule for management of electronic records, grant files, mathematical models, scientific data files, etc. will be followed unless the QA project plan states alternate retention times for project related materials.

Work funded by EPA grants is documented through DRBC progress reports and final reports to the agency as required by conditions of the grant.

Project records including QA-related documents, EDDs and final reports are maintained by the staff of the Modeling, Monitoring & Assessment Branch. The Project Coordinator establishes a permanent file for each project containing all correspondence, procurement documents, project-specific operating procedures, field data sheets, chain-of-custody documents, draft and final project reports. Draft and final project reports are reviewed by the project coordinator's supervisor and branch manager. QA issues are discussed with the QA Officer. The MM&A Branch Secretary maintains a file of all final QAPPs and project reports. Final project reports are posted on the Commission's web site.

COMPUTER HARDWARE AND SOFTWARE

Computer hardware evaluation at the Commission is the responsibility of the Planning and Information Technology Branch. This Branch is responsible for the procurement and maintenance of Commission servers and personal computers. The servers provide storage for information, correspondence and data bases. The servers are backed up on a daily basis. Requests for desktop and laptop personal computers are processed by this branch. The Modeling, Monitoring and Assessment Branch staff are responsible for evaluating commercial software for application to data acquisition, analysis and storage for projects. Microsoft Office products are the preferred software for data acquisition and analysis (MS Excel), storage and manipulation (MS Access) and word processing (MS Word). The branch is also responsible for developing, applying and maintaining hydrodynamic and water quality models for use in the water resource management responsibilities of the Commission. Mathematical models used by the DRBC are typically based upon model platforms developed by the U.S. EPA, U.S. Army COE, private companies or academia. Modeling projects funded by the EPA include the preparation, review and approval of a QAPP by EPA QA staff. Review and documentation is greater for mathematical models developed specifically for DRBC projects and less for purchased software with verifiable QA programs in place. Data integrity procedures will be described in QA Project Plans and may include the following:

- Model development under the guidance of an expert panel
- Model / software assessment (i.e., sensitivity analyses, comparison of output to field or lab data or output of another model, reasonableness checks, uncertainty analyses)
- Model calibration and validation
- Review by DRBC staff, modeling consultants, and advisory committees.
- Peer Review

Data integrity and transparency is also ensured by the following procedures:

- Long term data storage in appropriate media.
- Screening and verification of data (e.g., automated QA check, confirmation of number of parameters reported, review of quality flags reported) for consistency with QA Project Plan requirements.
- Providing all stored data with associated QA labels and associated metadata.
- Making data and reports readily available through EPA's WQX, the Commission's website, or upon request.

PLANNING

Systematic planning is conducted as part of the Commission's Annual Work Plan and through development of the yearly Section 106 grant application process. The Annual Work Plan is part of the Commission's Water Resources Program, a five year planning document required by the Delaware River Basin Compact. The components of both the Water Resources Program and

Annual Work Plan are developed by the staff and management of the DRBC with technical advice from advisory committees of the Commission including the Water Quality Advisory Committee and the Toxics Advisory Committee.

Each monitoring project in the Annual Work Plan has a QA project plan (QAPP) that contains the project goals and objectives and relationship to the Annual Work Plan. Each QAPP must be approved by the QA Officer. Following approval of a plan, staff are assigned to the Project Coordinator to complete the sampling objectives. Project Coordinators are authorized to make adjustments in the field where necessary to achieve the project objectives, and are responsible for documenting such modifications as amendments to the QA Project Plan. Data assessment techniques are developed by the Project Coordinator in consultation with staff of the Modeling, Monitoring and Assessment Branch (MM&A), and approved by their supervisor. All data collected during a project are required to be stored in an electronic data base. The principal data base for project data storage is WQX, but other data bases include New Jersey's Water Quality Data Exchange (NJWQDE) and Commission Access data bases. Where required, project reports are prepared by the Project Coordinators and include assessments of data quality and limitations following the specifications of the QAPP. Project reports are reviewed by the section supervisor and branch manager prior to finalization. Reports are placed on the Commission's website for public access, and Project Coordinators may be requested to update the appropriate Commission advisory committees with the findings of the project.

IMPLEMENTATION OF WORK PROCESS

Project work shall be performed according to QA project plans. Any deviations from the QA project plans must be documented in reports to the QA Officer and through modifications to the project QAPP. Significant deviations from the approved QAPP will also be reported to the funding agency.

Applicable documents (e.g., SOPs) will be followed in the performance of the work. The DRBC is certified by the New Jersey Department of Environmental Protection (ID# 11013) for the performance of the following parameters: specific conductance (EPA Method 120.1), dissolved oxygen (SM 4500-OC, Winkler, Azide modification), dissolved oxygen (SM 4500-O G, electrode), pH (SM 4500 – H B) and temperature (SM 2550 B). Preparation, review, approval, revision and withdrawal of SOPs are conducted under the NJDEP certification process. One staff member of the Modeling, Monitoring & Assessment Branch is assigned as the Laboratory Coordinator and is responsible for general care of the Commission's laboratories and monitoring equipment. Preparation, use and revision of the SOPs including the removal of obsolete material are also the responsibility of the Laboratory Coordinator. Approval of SOPs and verification that any changes to SOPs are made as prescribed is authorized by the QA Officer and Branch Manager/Laboratory Coordinator. SOPs are stored by the Branch secretary and tracked by version number and revision date including the removal of obsolete documents.

SOPs written and routinely used by DRBC staff are listed below:

- SOP #110.01 pH using Multi-Parameter Water Quality Meters: Measurements, Meter Calibration and Meter Maintenance
- SOP #120.01 Conductivity using Multi-Parameter Water Quality Meters: Measurements, Meter Calibration and Meter Maintenance
- SOP #130.01 Dissolved Oxygen using Multi-Parameter Water Quality Meters: Measurements, Meter Calibration and Meter Maintenance
- SOP #140.01 Temperature using Multi-Parameter Water Quality Meters: Measurements, Meter Calibration and Meter Maintenance

These SOPs were updated in the spring of 2011 and are revised when new equipment is purchased and utilized in Commission monitoring projects.

ASSESSMENT AND RESPONSE

The DRBC quality system includes the Water Resources Program, Annual Work Plan, Quality Management Plan, QA project plans, and SOPs. The QMP will be updated whenever necessary and formally reviewed at least annually by the Quality Assurance Officer and reported to Commission management. EPA III will be informed of any changes. The entire QMP will be re-submitted to EPA III for review and approval every 5 years.

An annual review of the quality systems will be coordinated by the Quality Assurance Contact, and may include systems audits, performance evaluation study results, audits of data quality, data quality assessments, technical reviews, or peer reviews conducted within the previous year identifying any problems and noteworthy practices with proposed recommendations for resolving issues identified. Due to the small size of the agency, assessment personnel shall come from the Modeling, Monitoring and Assessment Branch and possess the necessary knowledge and experience to perform the review. The Quality Assurance Contact will coordinate with assessment personnel such as the Laboratory Coordinator, and will prepare a report of the findings. The QA Officer will be authorized by DRBC management to access documents and perform other tasks necessary to conduct the assessment The Commission's Deputy Director and MM&A Branch Manager will review the assessment and ensure that corrective actions are implemented promptly. Documentation of the implementation of the corrective actions will be prepared and filed with the QA Management Plan.

QUALITY IMPROVEMENT

All Project Coordinators are responsible for reviewing the QA activities within their realm of responsibility, in order to promptly identify and resolve QA program problems and needs. All Project Coordinators, with the guidance of the QA Officer, will take appropriate corrective action when, how, and where necessary to resolve the problem(s). MM&A Branch supervisors are responsible for the QA activities associated with projects lead by coordinators within their section.

Yearly planning meetings are held with staff of state agencies involved with Commission monitoring activities to discuss planned activities, quality objectives and implementation of procedures to improve the quality of data generated. One example of this is the ongoing effort to improve the detection limits and quality of data on metal concentrations generated by the Boat Run Program. Similar meetings are frequently held for specific monitoring projects.

The QA Officer will be responsible for identifying and correcting any conditions affecting the quality of data generated by the Commission's monitoring activities, and will keep upper level management, as well as the Region III Quality Assurance office, adequately informed of all program problems, needs, and overall QA program status.

Table 1. Organization of DRBC Quality Assurance Management