



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

11201 Renner Boulevard
Lenexa, Kansas 66219

AUG 13 2019

MEMORANDUM

SUBJECT: Public Water Supply Supervision Program Quality Assurance Project Plan – Approved

FROM: *Diane Harris*
Diane Harris, Regional Quality Assurance Manager
Laboratory Services and Applied Sciences Division

TO: Ken Deason, Project Officer
Water Division
Groundwater and Drinking Water Branch

The review of the subject document prepared by the Nebraska Department of Health and Human Services/Nebraska Department of Environmental Quality and revised December 2018 has been completed according to “EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations,” EPA QA/R-5 March 2001. The document was also reviewed against the critical comments outlined in the previous QA review memo dated September 28, 2018.

The document is approved; it complies with R-5 and addresses the key issues satisfactorily including the previously identified critical comments.

If you have any questions, please contact me at x7258.

R7QAO Document Number: 2019164

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CONCURRENCE: Jordi:7734:080819:H:/ENST/IO/QA/Trainor/2019/2019164.mem.docx				
DIV/BR	LSASD/QA	LSASD/QA		
NAME	Harris	Davis		
DATE	08/09/2019	8/13/19		
INITIALS	DHA	[Signature]		

NEBRASKA

Good Life. Great Mission.

DEPT. OF HEALTH AND HUMAN SERVICES



Pete Ricketts, Governor

July 16, 2019

Diane E. Harris
US Environmental Protection Agency
300 Minnesota Avenue
Kansas City, KS 66101

Re: Nebraska Public Drinking Water Supply Program Quality Assurance Project Plan (QAPP)

Dear Ms. Harris:

With this letter, please find enclosed Nebraska's Public Water Supply Program QAPP as reviewed by you in September 2018, with signatures. Also enclosed, is a CD with all attachments referenced in the QAPP, and a copy of your September 28, 2018 comments for your reference.

Following your review, and signature, please forward to Ken Deason for his signature as well.

If you have any questions, or require additional information to complete your review, please feel free to contact me at (402) 471-0521 or andy.kahle@nebraska.gov.

Respectfully,

A handwritten signature in blue ink, appearing to read "A. Kahle".

Andrew L. Kahle, Program Manager
Field Services & Operator Training
Division of Drinking Water

Cc: Ken Deason, US EPA Region 7
Janell Miller, Drinking Water Division Administrative Assistant

PUBLIC WATER SUPPLY SUPERVISION PROGRAM - QUALITY ASSURANCE PROJECT PLAN (QAPP)



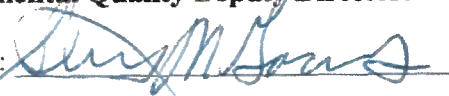
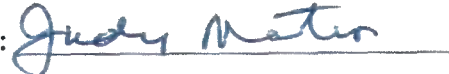
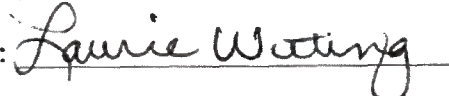


(Revised June 2008, December 2018)

Nebraska Department of Health and Human Services/
Nebraska Department of Environmental Quality
Drinking Water Division
1200 N St. Suite 400
PO Box 98922
Lincoln, Nebraska 68509-8922

Quality Assurance Project Plan

Project Name: Public Water Supply Supervision Program
Responsible Agency: Nebraska Department of Health and Human Services/Nebraska
Department of Environmental Quality
Division: Drinking Water

APPROVAL

Quality Assurance Project Plan Manager:	Andy Kahle
Signature: <u></u>	Date: <u>12-27-18</u>
Drinking Water Division Administrator:	Sue Dempsey, MS CPH
Signature: <u></u>	Date: <u>12-27-18</u>
Nebraska Department of Environmental Quality Deputy Director:	Steven M. Goans, P.E.
Signature: <u></u>	Date: <u>12-28-2018</u>
Division of Public Health Deputy Director:	Judy Martin, M. S.
Signature: <u></u>	Date: <u>12/27/18</u>
Laboratory Quality Assurance Manager:	Laurie Wieting
Signature: <u></u>	Date: <u>12-27-2018</u>
U.S. EPA Regional Quality Assurance Manager:	Diane Harris
Signature: <u></u>	Date: <u>08/05/2019</u>
U.S. EPA Project Officer:	Ken Deason
Signature: <u></u>	Date: <u>7/30/19</u>

2019164
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Attachment A – PHEL QAPP

Attachment B – DW Organizational Charts

Attachment C – DW Field Area Map

Attachment D – Grade V Operator Training Handbook

Attachment E – Public Water System Sample Projections

Attachment F – Title 179 Regulations Governing Public Water Supply Systems

Attachment G – DW Standard Operating Procedures

Attachment H – Sample Site Plans

Attachment I – Sample Site Selection Guide

Attachment J – Disapproved Sample Site Plan Letter

Attachment K – Summarized Data Flow Scheme

Attachment L – Sample Kit Instructions

Attachment M – Memorandum of Agreement

A3 Distribution List

1. Janell Miller, Drinking Water Division (DW) Administrative Assistant - Original for filing
2. Sue Dempsey, DW Administrator
3. Chin Chew, DW Engineering Services (ES) Program Manager
4. Justin Nelsen, DW Monitoring and Compliance (M&C) Program Manager
5. Andy Kahle, DW Field Services and Training (FS&T) Program Manager/QAPP Manager
6. Laurie Wieting, Laboratory Quality Assurance Operations Manager
7. Judy Martin, Community & Environmental Health Deputy Director, NDHHS
8. Ken Deason, U.S. EPA Project Officer
9. Diane Harris, U.S. EPA Quality Assurance Manager

Project Management

A4 Project/Task Organization

1. Purpose

U.S. EPA policies require all U.S. EPA supported monitoring agencies to develop and implement a Quality Assurance Project Plan to describe measures taken within the agency to ensure validity and defensibility of all environmental data generated for their use. This document is intended to fulfill that purpose.

2. Roles and Responsibilities

On July 18, 2017 the Nebraska Department Health and Human Services (NDHHS) and the Nebraska Department of Environmental Quality (NDEQ) entered into a Memorandum of Agreement (MOA), with the purpose of enhancing the protection of public health and the environment through improved customer service, and increased efficiency. NDHHS DW staff continue to administer the Program under the supervision of NDEQ. To facilitate communication between programs within the two Agencies who work with utilities, Lincoln-based DHHS Drinking Water Program Staff are co-located with NDEQ.

Responsibility for day-to-day program activities, such as consultation with clients for appropriate test selection, sample collection management, sample results interpretation, corrective measures and health effects, rests within DW. This Quality Assurance Project Plan (QAPP) is a written description of activities to be followed by DW to produce data of known and acceptable precision and accuracy. The plan consists of this document, as well as standard operating procedures, which DW management approves. Standard operating procedures insure proper utilization of laboratory generated data and other DW processes and procedures.

Laboratory responsibilities, processes and procedures to assure production of scientifically valid and defensible data rest with the Office of Public Health Environmental Laboratory Services (PHEL). The specific laboratory standard operating procedures and the current Laboratory QAPP are included as Attachment A to this

document. They are also available for viewing at the PHEL located at 3701 South 14th Street, Lincoln, Nebraska.

The term “license” or “licensed” is used throughout this document to describe a water operator with proper credentials to operate a public water system.

Organizational charts of the individuals participating in this project are included as Attachment B to this document. The organizational charts are meant to show all jobs related to public drinking water in DW.

Administratively, the chain-of-command from top down for the implementation of this QAPP is as follows:

- a. NDEQ Director – Jim Macy
- b. NDEQ Deputy Director for Water – Steve Goans
- c. Drinking Water Division Administrator – Sue Dempsey
- d. Quality Assurance Project Plan Manager and Field Services and Training Program Manager – Andy Kahle

The first two positions listed above are primarily organizational and/or advisory in nature and are not described in great detail in this QAPP.

The task organization also necessarily includes the employees of Public Water Systems (PWS) and any of their contractors.

This section describes the qualifications and responsibilities for the various positions:

- a. NDEQ Director
 - i. Directs and carries full responsibility for all activities, policies and decisions of NDEQ.
- b. NDEQ Deputy Director for Water (reports directly to the NDEQ Director)
 - i. Responsible for the activities of the Water Division of NDEQ, which through the MOA with NDHHS, includes DW.
- c. DW Administrator (reports directly to the NDEQ Deputy Director for Water)
 - i. The DW Administrator is responsible for the overall operation and administration of the section to ensure that all section assigned duties are properly performed. The DW Administrator is accessible to all section quality assurance related activities to provide on-site, telephone and electronic consultation as needed. The DW Administrator employs personnel that meet minimum job requirements for their assigned jobs.
- d. Monitoring & Compliance (M&C) Program Manager (reports directly to the DW Administrator)
 - i. The M&C Program Manager supervises six Drinking Water Program Specialists (Rule Specialists), one Information Systems Analyst, one Staff Assistant I, and one Staff Assistant II. The M&C Program Manager is responsible for:
 1. Overall operation and administration of the M&C Program.
 2. Implementation of M&C Program Standard Operating Procedures (SOP).

3. Ensuring that staff are provided with the necessary training and resources to do their work.
 4. Requiring that decisions to invalidate samples and the rationale for these decisions are documented in writing and approved and signed by the DW Administrator.
 5. Ensuring that accurate PWS data is entered into the Safe Drinking Water Information System (SDWIS) database by the appropriate staff.
 6. Ensuring that all reports required from the M&C Program are completed and submitted as necessary.
- Specific job duties for all M&C Program staff are found in the job descriptions on file with the Human Resources portion of the Department of Health and Human Services.
- e. Information Systems Analyst (reports directly to M&C Program Manager)
 - i. The information systems analyst is responsible for data management in the DW's Safe Drinking Water Information System (SDWIS) database. The main function of the information systems analyst is preparing reports, summarizing data and keeping the SDWIS database functional.
 - f. Drinking Water Program Specialists (reports directly to M&C Program Manager)
 - i. The drinking water program specialists are responsible for:
 1. Reviewing sample results to determine whether results exceed a maximum contaminant level, maximum residual disinfectant level, treatment technique, or action level.
 2. Reviewing sampling/monitoring reports submitted by PWS for regulatory compliance.
 3. Ordering confirmation samples when needed.
 4. Initiating additional sample collection when inconsistent or questionable results occur.
 5. Working with the PHEL to develop and, if needed, modify the sample instructions that are sent out with sample kits
 6. Advising PWS operators about proper sampling techniques when requested.
 - h. FS&T Program Manager/QAPP Manager (reports directly to the DW Administrator)
 - i. The FS&T Program Manager oversees activities in field services, capacity development, quality assurance and the water operator training and licensing programs for the DW. Specific duties include:
 1. Directing the resources of the FS&T program staff to assure that Nebraska's public water systems comply with the requirements of the Nebraska Safe Drinking Water Act and the regulations (Title 179 Chapters 2 through 26 [see Attachment F]) adopted under such Act. The regulations require all public water systems to meet various requirements, depending upon type and classification. Routine sanitary surveys are performed to check for deficiencies that a public water system may have. Follow-up sanitary surveys are used to follow-up on any deficiencies found during a routine sanitary survey.
 2. Holding at minimum 2 staff meetings annually.

3. Implementing FS&T standard operating procedures, reviewing the standard operating procedures when necessary and obtaining approval from the DW Administrator when changes are made.
4. Overseeing the training and licensing of public water system operators, including backflow preventer test and repair technicians. This includes both licensure training and license renewal training workshops and seminars.
5. Representing DW in activities including capacity development and oversight of contracts for technical assistance to public water systems funded through the 2% and 15% set-aside of the Drinking Water State Revolving Fund.
6. Evaluating the number of routine sanitary surveys completed on at least a quarterly basis, and submitting an annual report to the DW Administrator no later than July 1 of each year showing the percent of surveys completed based on the requirement that each community and non-transient non-community public water system be surveyed at least once every three year period and each transient non-community public water system be surveyed at least once every five year period. The acceptable percentage of completed surveys is 100%. The report will address the findings of the sanitary surveys by showing the (same desired) compliance rates for approved cross-connection control programs, sample site plans, encroachment prevention policies, licensed water system operators, preventive maintenance programs, deficiencies properly corrected on schedule, updated emergency plans, etc.
7. Annually reviewing the QAPP and revising it as necessary. When changes are needed, submitting the revised QAPP to U.S. EPA for review and concurrence.
8. When appropriate, making any changes recommended by the U.S. EPA Quality Assurance Manager or U.S. EPA Project Officer, documenting the changes and submitting the revisions for approval and ensuring all revisions are approved before they are implemented.
9. Ensuring the QAPP is properly approved by all parties named on the approval sheet before the QAPP is implemented.
10. Ensuring all the people involved in the work have copies of the approved QAPP.
11. Ensuring that said personnel understand the requirements prior to the start of data generation activities.
12. Implementing an effective, on-going intersectional audit program designed to evaluate the DW activities with regard to compliance with the DW QAPP. Such audit program will include provisions for frequency of audit activities, reporting audit findings to the DW Administrator, and documentation of necessary remedial actions taken to address observed QAPP shortcomings.
13. Ensuring proper employment of the QAPP assessments to determine if the project technical and quality objectives are being met.

14. Notifying the appropriate program manager if QAPP corrective actions are needed to rectify conditions adverse to quality.
 15. Where possible, eliminating conditions that are adverse to quality.
 16. Employing the data quality objectives process in an on-going effort to evaluate whether the environmental data involved in the project meets the type, quality and quantity of data needed to satisfy its specified use.
 17. Cooperating with PHEL Management and the DW Administrator in assessing the five basic aspects of project data: accuracy, precision, completeness, representative and comparability.
 18. Preparing an annual report detailing the assessment conclusions by June 1 every year and submitting copies for review and corrections to the DW Administrator and PHEL Administrator.
 19. Assessing the DW standard operating procedures that are updated on an as needed basis. New and revised standard operating procedures may result from recommendations by any staff member. They are reviewed and critiqued by designated staff members and approved by the DW Administrator. The coordination of this activity is the responsibility of the program managers of M&C, FS&T and ES, who are under the direct supervision of the DW Administrator. The Advisory Council on Public Water Supply is advised of any necessary SOP changes at periodic meetings. The QAPP Manager assesses the SOP revision procedures annually based on QAPP objectives, placing any findings and/or conclusions in the annual report.
- i. Water Supply Specialists (report directly to FS&T Program Manager)
 - i. There are eight (8) field areas and eight (8) water supply specialists working out of seven (7) locations/offices in Nebraska. A map identifying these assigned field areas is included as Attachment C of this document.
 - ii. Their primary responsibilities are to perform sanitary surveys, conduct and review RTRC Assessments, assist the Operator Training and Licensing Coordinator (Environmental Quality Program Specialist) in the training of water system operators, proctoring water operator licensure exams in their individual field offices, collecting water samples when necessary, providing advisory service to public water systems, and assisting the Engineering Services Section in the performance of construction inspections.
 - j. Environmental Quality Program Specialist/Operator Training and Licensure Coordinator (reports directly to the FS&T Program Manager)
 - i. This position is responsible for the coordination of the DW's Water Operator Licensure and Training Program activities. Activities under this position include:
 1. Scheduling and presentation of water operator licensing and training courses.
 2. Keeping all water operating training course material updated with the latest information pertinent to proper water system management, operation and maintenance, and regulatory compliance.

3. Producing the DW's newsletter (the Water Spout) on a quarterly basis.
 4. Overseeing any grants that are utilized by the DW specifically for the benefit of public water system operator training or licensure.
 5. Preparing and submitting required reports regarding Water Operator Training Program activities to the FS&T Program Manager and U.S. EPA.
- k. Environmental Assistance Coordinator (reports directly to the FS&T Program Manager).
- i. There is currently one position filled under this job title; designated as the sections Capacity Development/Water System Security Coordinator. The activities of this position are:
 1. Capacity Development:
 - a. Oversee the implementation of the States Capacity Development Strategy.
 - b. Prepare and submit for approval the required Capacity Development reports.
 - c. Prepare Requests for Proposals for contract services utilizing the 2% Set-aside of the Drinking Water State Revolving Loan Fund monies.
 - d. Coordinate the activities under the 2% contracts.
 - e. Provide educational training regarding Capacity Development, Asset Management and other related activities at and for public water systems across Nebraska.
 2. Water System Security (With assistance from FS&T Program Manager and staff):
 - a. Oversee the allocation and use of Security Grant funds utilized from the Drinking Water State Revolving Loan Fund (15% Set-aside).
 - b. Review and approve Emergency Response Plans submitted by public water systems (every 3 years).
 - c. Review and approve annual submissions of Critical Information Emergency Contact Lists from public water systems.
 - d. Provide training to public water system personnel regarding emergency preparedness and emergency response planning (Disaster preparedness, NIMS/ICS, Pandemic Flu, COOP, etc.).
 - e. Coordinate staff training for emergency field water quality testing and emergency communications.

3. Principal Data Users

- a. The principal data users are as follows:
 - i. The personnel who work in the M&C Program of DW, including the Drinking Water Program Specialists, Information Systems Analyst, and the Program Manager. M&C Program personnel review analytical results from public water systems for at least three purposes:

1. To determine if any public water system exceeds a maximum contaminant level or other standard (e.g., action level, treatment technique);
 2. To determine if public water systems have monitored their water systems in accordance with state regulations (U.S. EPA ensures that state regulations are as stringent as U.S. EPA regulations through their primacy reviews), and
 3. To check for errors, omissions or results that are suspicious because of the history.
- ii. Owners and operators of public water systems use analytical results from their individual water systems for a variety of reasons including:
1. To determine if their public water system exceeds a maximum contaminant level or other standard (e.g., action level, treatment technique);
 2. To determine if the public water system has sampled its water system in accordance with Title 179;
 3. To monitor operations and provide assurance of proper maintenance practices on the water system;
 4. To investigate the reason for total coliform detections in the water system;
 5. To plan; and
 6. To prepare reports for its consumers regarding the quality of drinking water.
- iii. The personnel who work in the FS&T Program use the analytical results to follow up on violations and to identify compliance during public water system sanitary surveys, and in the course of prescribed work duties and responsibilities (described in A4.2.i. of this document).
- iv. The personnel who work in the ES Program use the data during the review and approval process for new construction and major changes to assure all results meet the required regulations and water quality standards prior to approval. Records are maintained in electronic format in the SDWIS database as well as in a hard file located in the Lincoln office, and are microfilmed and kept as long as the project is in use.

4. Secondary Data Users

- a. The secondary data users are as follows:
 - i. The Nebraska Department of Environmental Quality for Superfund activities, Resource Conservation and Recovery Act activities, Leaking Underground Storage Tank activities, wellhead protection activities, groundwater protection activities and other activities.
 - ii. The Nebraska Department of Agriculture for Federal Insecticide, Fungicide and Rodenticide Act activities.
 - iii. The U.S. EPA for a variety of reasons including oversight of Nebraska's public water system supervision program, Superfund activities, community-based activities, regulations and development.
 - iv. Nebraska Rural Water Association, Midwest Assistance Program, League of Nebraska Municipalities, Central Community College and the Nebraska Section American Water Works Association (referred to as the 2%

Technical Assistance Team) for activities associated with the Department's Capacity Development Program.

A5 Problem Definition/Background

1. Background

Beginning June 24, 1977, all public water systems had to comply with the provisions of the Federal Safe Drinking Water Act and of the National Primary Drinking Water Regulations (40 CFR 141). In addition to prescribing maximum contaminant levels and monitoring frequencies for various substances in drinking water, the National Primary Drinking Water regulations also require that all testing for regulated contaminants be performed by the PHEL or by laboratories that are licensed and have entered into an agreement with the Department of Health and Human Services as allowed in Title 179 Chapter 20.

The Nebraska Safe Drinking Water Act, Nebraska Revised Statutes 71-5301 through 71-5313 provides authority for regulations (Title 179) to ensure that drinking water supplied to consumers of all public water systems does not contain amounts of chemical, radiological, physical or bacterial material that may be harmful to public health.

U.S. EPA establishes action levels, treatment techniques, maximum residual disinfectant levels and maximum contaminant levels. Nebraska adopts new or revised primary drinking water regulations at least as stringent as those established by U.S. EPA. Nebraska regulations, Title 179, establish monitoring requirements for public water systems. Public water system sample collection location, and frequency of monitoring, is prescribed in the state and federal regulations adopted under the Federal Safe Drinking Water Act. The regulations are reflective of science-based risk assessment, and are designed to be protective of public health.

2. Decisions To Be Made

To implement the provisions of the Nebraska Safe Drinking Water Act, Title 179 was promulgated to set forth drinking water standards and monitoring requirements for a variety of contaminants. These regulations establish a fixed threshold value in the form of maximum, minimum, and water system operational levels for various water quality monitoring which are the basis for state decisions on enforcement action against public water systems for violation of Title 179.

A6 Project/Task Description and Schedule

1. Project Objective

The objectives of this project are to provide quality assured monitoring for Nebraska's public water systems and to determine public water system compliance with Title 179 regulations. To measure these objectives, water quality analyses are performed and the resulting data compared to the applicable drinking water standards for primary drinking water regulations.

The generation of data that can be used successfully to fulfill the needs of DW requires that the collection of samples follow established written protocols and that all analytical procedures are to be conducted by trained, experienced personnel using properly calibrated equipment and following approved written laboratory protocols.

Requirements for special radionuclide monitoring for community water systems and non-transient, non-community water systems that use water receiving effluents from a nuclear facility is not included in this QAPP. Also, radon monitoring is not included, nor is low-level waste, wastewater, air, solid waste or hazardous waste monitoring. The environmental data, as generated and processed by DW and analyzed by the PHEL on behalf of a public water system is from the drinking water supplies.

It is a primary objective that this QAPP effectively coordinate the associated activities of the DW and the PHEL to assure quality data in the collection of water samples and water quality analyses. Another primary objective is to provide the resulting data for monitoring and compliance, plan review, public water system permitting purposes and for use by the U.S. EPA.

As a secondary objective, standard operating procedures that are used by the DW and are critical for the assurance of quality data, are written and included in Attachment G of this document.

As of July 31, 2018, (during the QAPP updating process) there are 606 Community, 605 Transient Non-community, and 139 Non-transient Non-community permitted public water systems in Nebraska.

2. Description of Work Performed

According to the Code of Federal Regulations, Title 40, Part 141, the public water system owner is responsible for compliance with the primary drinking water regulations established by U.S. EPA. Title 179 Chapter 10-003 requires that all PWS must have a licensed operator. Title 179 Chapter 10-003.01 requires the owners of all community and non-transient non-community public water systems to place the direct supervision of the system under the responsible charge of a properly licensed operator(s). This designated person(s) will be responsible for all compliance issues relating to the operation and maintenance of the public water system, which includes adherence to the primary drinking water regulations.

The sample collection locations and frequencies are prescribed in state and federal regulations. The state regulations containing this information are incorporated in various chapters of Title 179. The Federal regulations that contain this information are located in the Code of Federal Regulations, Title 40, Part 141. All samples required in accordance with Title 179 are samples of water delivered by a public water system for human consumption unless otherwise stated.

To make the decision on compliance with the primary drinking water regulations, the contaminants listed below are monitored, data assessment tasks performed and the resulting data compared to the applicable standard, action level, treatment technique or

maximum residual disinfectant level. Tools for assessment include historical information and data, program personnel, and other resources as necessary.

The following regulatory citations in Title 179 identify the water quality parameters to be monitored, and the maximum contaminant level, maximum residual disinfectant level, treatment technique, or action level. See Attachment F.

- a. Microbiological - Title 179 Chapter 2-002.04C, 25-004, 26-011
- b. Disinfection Byproducts - Title 179 Chapter 2-002.04E, 23-004.02, 24-004
- c. Synthetic Organic Chemicals - Title 179 Chapter 2-002.04B2
- d. Inorganic Chemicals - Title 179 Chapter 2-002.04A
- e. Volatile Organic Chemicals - Title 179 Chapter 2-002.04B1
- f. Water Quality Parameters - Title 179 Chapter 12-005.03C, 12-010, 13-007.01, 16-004, 16-005.04, 17-004.02B, 19-007.04
- g. Turbidity - Title 179 Chapter 13-004.01B, 13-006, 17-005, 19-010
- h. Disinfectants (Maximum Residual Detection Level) - Title 179 Chapter 2-002.04F
- i. Detention Time Measurements/Log Removal - Title 179 Chapter 13-007.02C
- j. Microparticulate Analysis (MPA) Tests - Title 179 Chapter 13-003.02
- k. Lead Ban - Title 179 Chapter 11-003 (this chapter needs to be revised to comply with the new Federal "Reduction of Lead in Drinking Water Act", 0.25% lead content by weighted average of the wetted surface area of pipes and fittings).
 - l. Lead and Copper - Title 179 Chapter 12-003.01
- m. Radionuclides - Title 179 Chapter 2-002.04D

Key indicators are used to assure data regarding the above water quality parameters is of acceptable quality, is reviewed and approved by appropriate DW personnel annually and included in the PHEL QAPP.

Supportive compliance data and verification of on-site data will be obtained through the performance of public water system sanitary surveys. Sanitary surveys are performed once every 3 years for community and non-transient, non-community public water systems, and once every 5 years for transient non-community public water systems.

The project, including laboratory analysis, is ongoing with no scheduled completion date. Due to the on-going nature of this project, maintenance of required records and reports is also on-going.

3. Project Reports

- a. PHEL
 - i. All PHEL reporting criteria may be viewed in Section 8.4 of the PHEL QAPP. Annual summary reports of PHEL QAPP functions are to be delivered to the QAPP Manager at least 10 days prior to the annual review of the DW activities.
- b. DW
 - ii. Annually, the Capacity Development Coordinator will prepare a report to be submitted to U.S. EPA detailing the DW's Capacity Development activities for new public water systems.

- iii. A public water system supervision report is prepared annually by M&C staff for submittal to the Governor and U.S. EPA showing the previous year's activities of the DW and the status of public water systems in Nebraska. The M&C Program Manager will prepare a quarterly report to be submitted to U.S. EPA showing reportable violations, dates, and the DW's follow-up/enforcement activities.

A7 Quality Objectives and Criteria for Measurements Data

1. Objective

The data quality objective for this project is to provide valid data of known and documented quality for analytical results of water samples collected from public water systems as required by Title 179. All public water systems in Nebraska are required to comply with the applicable drinking water standards, treatment techniques, maximum residual disinfection levels, and action levels addressed in Title 179. These public water systems collect water samples for analysis at locations and on a frequency established by Title 179. Acceptability decisions based on the review of the analytical results are used to determine public water system compliance with National Primary Drinking Water Regulations set forth by U.S. EPA, and adopted by regulation in Nebraska. Compliance decisions are based on monitoring periods and compliance cycles established in Title 179.

Two possible decision errors can occur due to poor data quality; false positive or false negative. A decision based on a false positive can impose a potentially substantial cost to a public water system or individuals operating that system when this action is not needed to attain compliance with public water system regulations. A decision based on a false negative error can result in failing to take action to protect public health from unacceptable levels of drinking water contaminants. The greater concern would be a false negative error. DW is most concerned about a water quality monitoring program that is inadequate to protect public health.

2. Data Quality Indications

The data quality indicators that will be used to interpret the acceptability of the data obtained during this project are:

- a. Accuracy and Precision - Analytical laboratories used for analysis of primary drinking water contaminants for compliance purposes maintain U.S. EPA, National Environmental Laboratory Accreditation Program or PHEL certification for the analytical methodologies referenced by regulation for the specific drinking water contaminants. Those certifications require laboratories to maintain certain accuracy and precision requirements. These limits are acceptable to the project and constitute adequate accuracy and precision for this project.
- b. Representative - This is addressed by the collection of water samples for public water systems as prescribed in Title 179, Chapters 3, 8, 12-13, 16-17, 19, and 23-26.
- c. Comparability - This is addressed by the collection, prescribed analytical techniques, and reporting of data as described in this document.

- d. **Completeness** - Although on-going, this project requires an error rate of 0% (a goal of 100% accuracy) for all analytical results to effectively determine public water system drinking water quality. Valid data is required to make any decision regarding public water system water quality compliance with Title 179 regulations adopted under the Nebraska Safe Drinking Water Act, and ultimately enforcement action against those public water systems that do not comply with those standards.

Measurements used to determine compliance with Title 179 will meet the performance requirements established by U.S. EPA. Data requested for use by others will meet requested performance requirements, or have limitations placed on its use.

A8 Special Training/Certification

1. PHEL

All PHEL training and certification criteria can be found in Section 3 of the PHEL QAPP.

2. Public Water System Sample Collectors

Samples from public water systems may be collected by licensed water system operators, or other persons who have received appropriate training in the collection, preservation and submission of water samples for regulatory compliance. Appropriate training consists of both hands-on and written sampling instructions. Documented verification of appropriate unlicensed sampler training is required and maintained by DW.

Training for Grades III and IV water operators includes training in sampling procedures and techniques. Because an operator must successfully pass the Grade III exam before becoming a Grade II or Grade I licensed operator, all licensed water operators have received training and passed examinations in sampling procedures, rules, and regulations for all required samples. Licensure training for Grades I and II may include an on-site tour of a laboratory facility which includes supplemental discussion on the reasons for proper sample containers; the accompanying instructions and laboratory forms; how to use, handle and transport samples; and the turnaround time required for the samples.

Grade V operators are supplied written sampling instructions in the Grade V Handbook (see Attachment D) as well as receiving written sampling instructions with each sample kit they receive.

The DW has developed a form entitled "Sampling Training for Individuals Other Than Licensed Operators" It is applicable for water sampling conducted in all systems. The DW has incorporated it into Title 179 Chapter 3 as Attachment 1. After the form is filled out and signed by the trainer and the trainee, it is sent to DW and reviewed by the FS&T Program Manager. M&C staff then enter information for the trainee into the SDWIS database as a sampler for the appropriate system.

For lead and copper samples, water operators are allowed to provide the resident(s) of the homes with instructions on how to take the samples when the resident(s) do not want to

allow the water operator access to their homes. In this case, it is the licensed water operator's responsibility to explain the proper sampling procedure to the person who takes the sample. Written instructions may also be given to the resident(s).

Construction contractors (and any other persons) who take samples are provided with written sampling procedures for each parameter or group of parameters with the sample kits the laboratory sends (see Attachment L). The DW and PHEL develop these sample collection instructions based on sample collection protocols prescribed by the analytical methods and the sample location requirements cited in state and federal public water system regulations. This is addressed in the PHEL QAPP.

3. Water Operator Training

a. Grades I, II, III and IV

- i. The Nebraska water operator licensing program maintains compliance with EPA guidelines. Need-to-know information, which is required for licensure and used in continuing education, is determined through an examination validation process with use of subject matter experts. Exam questions are selected to represent that information. New exams are developed and then reviewed by the Advisory Council on Public Water Supply which recommends them for approval by the Division of Public Health Director of the Department of Health and Human Services.
- ii. The Training Coordinator grades the examinations, verifies information on the applications for licensure, and determines the individual's eligibility for licensure. When an examination is successfully completed, the eligible individual is provided a license application to complete and submit to the Office of Licensure for issuance of a license.
- iii. The Training Coordinator analyzes all test results. If results show a question to be ambiguous or confusing, the question may need to be reworded or discarded. Subject matter experts are used to change as well as to develop questions for exams. Questions for exams are taken from a question bank, where they are separated by subject matter. The DW periodically utilizes the services of a psychometrician to review and validate the process the DW uses in the development of examination questions and the examinations themselves. This process lends credibility and defensibility to the exam content and question/examination development process.
- iv. The textbooks referenced below are used in training for preparing students for licensure examination. These are followed closely, except where Nebraska regulations or typical water works practices are different. These textbooks are supplemented with the DW supplied student notebooks that contain current regulations and other subject material. These training program textbooks are all obtained from California State University, Sacramento Training Manuals (latest editions):
 1. Water Distribution System Operation and Maintenance
 2. Small Water System Operation and Maintenance
 3. Water Treatment Plant Operation - Volume I
 4. Water Treatment Plant Operation - Volume II

- v. After each class, students fill out class evaluations, which are reviewed by the FS&T Program Manager. Identified issues or suggested changes in class materials and teaching techniques are reviewed with the Training Coordinator and considered for implementation.
 - vi. The Training Coordinator is assisted by other instructors, typically FS&T personnel. Peer review on training technique and information accuracy benefits the program.
- b. Grade V
- i. Grade V (transient non-community public water system) water operator applicants are provided a self-study training handbook compiled by the DW that includes the regulations that apply to a transient non-community public water system. It also includes public water system responsibilities and water quality sampling procedures. Successful completion of an exam is required for licensure, after the applicant for licensure reviews the handbook. To insure the actual license applicant takes the exam, the open book exam is completed in one of the Department's Field Offices. The exam is collected from the examinee by the FS&T personnel for grading. A score of 70% or better is required for licensure. If requested, any incorrect answers are explained before re-examination. Grade V Handbook (Attachment D) is the primary source of sampling information.
- c. Continuing Education
- i. Seminars, workshops, and conferences for water operator continuing education at times include discussion and demonstrations on water quality sampling. M&C Program or PHEL personnel are sometimes asked to speak on these topics. It is an established policy to have FS&T Program personnel at all water operator training sessions in their respective field areas to learn, receive feedback and maintain rapport with representatives of public water systems. While in attendance, FS&T personnel frequently provide an update on the DW activities.
 - ii. Training topics and locations are established by needs identified from sanitary survey results in coordination with training providers such as the League of Nebraska Municipalities, Nebraska Rural Water Association, the Midwest Assistance Program, and the Nebraska Section of the American Water Works Association.
 - iii. FS&T personnel are periodically used as on-site sampling trainers. All inspectors are licensed former water system operators, all having had at least 10 years of water system operation experience, and are uniquely qualified in the subject of sampling. Their knowledge on new monitoring and compliance procedures is updated during staff meetings. Routine sanitary surveys include discussions with water operators regarding proper sample site selection, monitoring, water sample site plan modification, required reports and records as needed. Advisory service is provided to operators if requested.

4. Other

- a. It is a training policy to provide train-the-trainer training to keep their knowledge and skills current. FS&T trainers attend American Water Works Association teleconferences related to their job duties. The FS&T Program Manager attends U.S. EPA seminars, and other training teleconferences, workshops, etc. The FS&T Program Manager also holds meetings with program personnel to relay any new information.
 - i. As rules and regulations change, M&C Program personnel train FS&T Program personnel in the latest monitoring and compliance regulations.
 - ii. DW is currently running the latest version of the Safe Drinking Water Information System Release 3.3 database. This version includes inventory, management, sample collection, collection schedules, compliance determination and federal reporting. An electronic user's guide for Release 3.3 has been developed for DW personnel for use in data entry and retrieval activities. In addition, M&C Program personnel provide training to other DW staff relating to SDWIS data entry and retrieval.

A9 Documents and Records

1. Documentation

Information pertinent to PHEL documentation of public water system water samples can be found in Section 7 of the PHEL QAPP. Computer data entry of sample and analytical test result information will be as specified in the approved PHEL protocols.

2. Records

Information pertinent to PHEL recordkeeping of public water system sample results can be found in Section 8 of the PHEL QAPP.

Public water system sample data is electronically entered into SDWIS for the DW retrieval and will be retained in an electronic format for the length of time required by federal regulations in 40 CFR 142.14. Pertinent hard copy information as appropriate in regard to monitoring and compliance, analytical results, and field evaluations will be retained for the length of time required by federal regulations in 40 CFR 142.14.

Data Acquisition

B1 Sampling Process Design

1. Sampling Process Design

All measurements to determine compliance with Title 179 are classified as critical, meaning that samples with results above the maximum contaminant level may indicate a situation that may be detrimental to human health.

2. Sampling Process

DW personnel and PHEL personnel make projections of sample numbers annually. These projections are shown in Attachment E of this document, titled "Public Water System Sample Projections."

The owner of the public water system is responsible for collection and returning the water samples to the PHEL for analysis and the required reporting of on-site monitoring results to the DW within time frames as specified in Title 179. The sample collector must collect the water sample and return it by appropriate transport to the PHEL within the prescribed holding time. Title 179 requires that public water systems collect water samples on an on-going basis. M&C Program has oversight for seeing that public water systems are meeting their sampling obligations.

For samples other than routine water quality compliance monitoring, M&C Program personnel supply names, addresses and sample kits requested to the PHEL.

Normally all radiochemistry, volatile organic chemicals, synthetic organic chemicals and inorganic chemical samples are collected by the licensed water system operator. FS&T Program personnel may assist with sample collection if deemed appropriate and necessary.

3. Type, Frequency and Locations of Samples

(See Attachment F, Title 179, for all regulatory references)

a. Microbiological

- i. All public water systems are required by Title 179 Chapter 3-004.01A & Chapter 26-004 to develop and follow microbiological sampling site plans. Guidance for selection of appropriate microbiological sample sites is provided in Attachment I. The DW requires that these plans be submitted for review and approval. These regulations require public water systems to submit an updated sample site plan whenever a change is made to the plan. The details required in the sample site plan may be viewed in the referenced regulations.**
- ii. The frequency and number of routine samples required is cited in Title 179 Chapter 26-005 through 008.**
- iii. Surface water systems or groundwater systems under the influence of surface water that do not practice filtration must collect samples for total coliform if the turbidity level of 1 nephelometric turbidity unit (NTU) is exceeded. This is addressed in Title 179 Chapter 26-007.03 & 008.03. Any samples taken pursuant to this regulation are included in the MCL compliance determination for coliform bacteria.**
- iv. Special purpose total coliform samples are required to determine whether disinfection following system maintenance has been sufficient. This is addressed in Title 179 Chapter 22-004 item 4.**
- v. If a public water system collects a routine total coliform sample and it is found to be total coliform positive, the public water system is required to collect repeat samples as required in Title 179 Chapter 26-009. Public water systems monitoring less often than monthly, must collect additional**

routine samples in the month following one or more total coliform – positive samples as addressed in Title 179 Chapter 26-005.10.

- vi. Total coliform sample results can be invalidated under certain conditions. This is addressed in Title 179 Chapter 26-004.03.
- vii. Any public water system using groundwater under the direct influence of surface water must monitor for surface water fecal coliform or total coliform density prior to the first or only point of disinfectant application each week the system serves water to the public according to the following minimum frequency:

System Size (persons served)	Samples per week
500 or less	1
501 to 3,300	2
3,301 to 10,000	3
10,001 to 25,000	4
Over 25,000	5

- 1. Every day the system serves water to the public, one fecal or total coliform density measurement must be made for each sample which exceeds 1 NTU (these count toward the above weekly coliform sampling requirement). This is addressed in Title 179 Chapter 13-007.02A.
- 2. Note 1: DW personnel instruct the PHEL to send out sample kits to the public water system owners unless requested by the owner to mail directly to the operator in responsible charge. Regulations require that samples be collected by a licensed operator or a person who has received training in proper sample collection procedures.
- viii. Heterotrophic bacteria measured as heterotrophic plate count may be used in lieu of residual disinfectant concentration measurements as specified in Title 179 Chapter 13-007.02F1 and Title 179 Chapter 16, Attachment 2, item A.

b. Disinfection Byproducts

- i. A community water system or non-transient non-community water system which adds a disinfectant (oxidant) to the water in any part of the drinking water treatment process or purchases water from another system which adds such a disinfectant continuously must collect samples for disinfection byproducts as specified in Title 179 Chapter 16-005.02.
- ii. Disinfection applied to a ground water system is either continuous or for system maintenance purposes. This is determined by consecutive or cumulative days during which the disinfectant is added as specified in Title 179 Chapter 16, Attachment 1, item C.
- iii. A system that practices maintenance disinfection as defined in 3.b.ii. above, must submit a report to the DW providing information as to the nature of the disinfection practice as specified in Title 179 Chapter 16, Attachment 1, item C.

- iv. Transient water systems that add chlorine dioxide as a disinfectant must monitor for chlorite as specified in Title 179 Chapter 16-005.03, item 2.
 - v. Samples for disinfection byproducts must be collected in accordance with a developed monitoring plan as specified in Title 179 Chapter 16-005.06.
 - vi. Routine monitoring frequency and location for total trihalomethanes (TTHM) and haloacetic acid (HAA5) is addressed in Title 179 Chapter 16-005.02, item 1.a. Criteria for reduced monitoring is addressed in Title 179 Chapter 16-005.02, item 1.b.
 - vii. Monitoring frequency and location for chlorine dioxide and chlorite is addressed in Title 179 Chapter 16-001.01, item 2 and 16-005.02, item 2.
 - viii. Community water systems and non-transient, non-community water systems that add ozone as a chemical oxidant must collect samples for bromate. Monitoring frequency and location is addressed in Title 179 Chapter 16-005.02, item 3.
 - ix. Determining compliance with the maximum contaminant level for each disinfection byproduct is addressed in Title 179 Chapter 16-006.
 - x. Systems that are required to collect disinfection byproduct samples quarterly or more frequently must report information to the Department within 10 days after the end of each monitoring period in which the samples were collected as specified in Title 179 Chapter 16-007.01.
 - xi. A public water system using surface water or ground water under the direct influence of surface water must meet treatment technique requirements for disinfection byproduct precursors as specified in Title 179 Chapter 16-008.
 - xii. A public water system using surface water or ground water under the direct influence of surface water which uses conventional filtration must monitor for total organic carbon as specified in Title 179 Chapter 16-005.04.
- c. Volatile Organic Chemicals
- i. Community water systems and non-transient, non-community water systems must monitor for the volatile organic chemicals listed in Title 179 Chapter 2-002.04B1. Systems that have previously detected volatile organic chemicals (results at a level exceeding the method detection limit) and these systems that find volatile organic chemicals above the method detection limit during any round of routine monitoring have to monitor quarterly. These samples are collected from points of entry to the distribution system. Monitoring frequency, location, waiver availability and compliance calculation are addressed in title 179 Chapter 3-007.02.
- d. Nitrates/Nitrites
- i. Every community water system; non-transient, non-community water system; and transient, non-community water system must perform routine monitoring for nitrate and nitrites. The frequency and location is addressed in Title 179 Chapter 3-005.04 and 3-005.05. More frequent monitoring is required under the circumstances listed in Title 179 Chapter 3-005.04B and 3-005.05 items 1 and 2.

- e. Inorganic Chemicals (except asbestos, fluoride, nitrate and nitrite) are addressed in Title 179 Chapter 3-005.
 - i. All community water systems and non-transient, non-community water systems must monitor for inorganic chemicals to determine compliance with the maximum contaminant level. Monitoring frequency is addressed in Title 179 Chapter 3-005.03. Sampling sites and protocol are addressed in Title 179 Chapter 3-005.01.
 - ii. Monitoring waivers are available. A request for a waiver from the DW must be made in writing and must set forth the basis for the request as addressed in Title 179 Chapter 3-005.03, items 2 through 6.
 - iii. Public water systems with point of entry samples that exceed an inorganic chemical maximum contaminant level must monitor quarterly as specified in Title 179 Chapter 3-005.03, item 7.
 - iv. The DW may decrease the quarterly monitoring provided the system is reliably and consistently below the maximum contaminant level as specified in Title 179 Chapter 3-005.03, item 8.

- f. Fluoride
 - i. Community water systems and non-transient, non-community water systems must monitor for fluoride on the same frequency and at the same location as other inorganic chemicals (except asbestos, nitrate and nitrite) as specified in Title 179 Chapter 3-005.03.
 - ii. Community water systems that exceed 2.0 mg/l fluoride in water supplied to the consumers must provide public notification as specified in Title 179 Chapter 4-010.

- g. Asbestos
 - i. Community water systems and non-transient, non-community water systems must monitor for asbestos in accordance with the requirements of Title 179 Chapter 3-005.02.

- h. Water Quality Parameters
 - i. Any public water system that exceeds the action level for lead and copper must measure the following water quality parameters: pH, alkalinity, calcium, conductivity, orthophosphate (when an inhibitor containing phosphate compound is used), silicate (when an inhibitor containing silica is used), and water temperature. Sample collection locations and frequencies for pH, alkalinity, calcium, conductivity, orthophosphate, silicate, and water temperature are addressed in Title 179 Chapter 12-010. Sample collection locations, methods and frequencies for lead and copper are addressed in Title 179 Chapter 12-011. Temperature, residual disinfectant concentrations, turbidity and pH measurements relating to surface water treatment is addressed in Title 179 Chapter 13-007.01. Residual disinfectant concentrations are addressed in Title 179 Chapter 13-007.03C. Monitoring requirements for disinfection byproducts are found in Title 179 Chapter 16-005.

- i. Synthetic Organic Chemicals
 - i. Community water systems and non-transient, non-community water systems must sample each point of entry to the distribution system after any treatment or at representative points in the distribution system of a surface water system for the contaminants listed in Title 179 Chapter 2-002.04B2. Monitoring frequencies, location, waiver availability and compliance calculation are addressed in Title 179 Chapter 3-007.03.

- j. Turbidity (public water systems using surface water or ground water under the direct influence of surface water)
 - i. Unfiltered systems using surface water and/or ground water under the direct influence of surface water as their source must measure source water turbidity at a frequency set by Title 179 Chapter 13 and at no time shall it exceed 5 NTU. The location and frequency of turbidity measurements is addressed in Title 179 Chapter 13-007.02B. Nebraska has no such systems.
 - ii. Turbidity monitoring for surface water systems or ground water systems under the direct influence of surface water and filter effluent turbidity requirements are addressed in Title 179 Chapter 13-007.03, 17-005, 17-006, 19-009 and 19-010.

- k. Disinfection Measurements
 - i. A surface water system or ground water system under the direct influence of surface water that does not use filtration must monitor the residual disinfectant concentration of the water entering the distribution system continuously. Systems serving 3,300 or fewer persons may take grab samples in lieu of continuous disinfectant monitoring. Locations and frequencies are addressed in Title 179 Chapter 13-007.03B and 13-007.03C.
 - ii. A surface water system or ground water system under the direct influence of surface water that does not use filtration must monitor the residual disinfectant concentration of the water entering the distribution system continuously. Systems serving 3,300 or fewer persons may take grab samples in lieu of continuous disinfectant monitoring. Locations and frequencies are addressed in Title 179 Chapter 13-007.02E and 13-007.02F.
 - iii. A surface water system or ground water system under the direct influence of surface water serving 10,000 or more people that meets the criteria of Title 179 Chapter 17-004.01E is required to develop a disinfection profile. Sample parameters, locations and frequencies are addressed in Title 179 Chapter 17-004.02.
 - iv. Minimum allowable residual for public water systems practicing continuous disinfection is dependent upon the water source used. Locations and frequencies of sample collection are addressed in Title 179 Chapter 16-005.03, item 1a. Compliance is based on the requirements of Title 179 Chapter 16-006.03.

- v. Maximum residual disinfectant levels are identified in Title 179 Chapter 2-002.04F1. Sample locations and frequencies are addressed in Title 179 Chapter 16-005.03.
- l. Detention Time Measurements/Log Removal
 - i. Regulations do not require detention time measurements be made, just contact time calculations to determine log removal values. Locations and frequencies of parameters to be measured for log removal determinations are addressed in Title 179 Chapter 13-007.02C.
- m. Microparticulate Analysis (MPA) Tests
 - i. If a source of ground water is determined to be potentially at risk to the direct influence of surface water, then it must be investigated further by the method described in Title 179 Chapter 13, Attachment 2, items III.D.1-3.
 - ii. Under current regulations, a minimum of a set of two MPA samples must be collected and analyses performed for the presence of green algae, blue-green algae, diatoms, nematodes, flagellates, and gastrotrichs. The presence of any of these indicators in both samples will be considered conclusive evidence of direct surface water influence. An additional set of two samples may be required by DW if sample results are inconsistent.
- n. Lead Ban
 - i. FS&T Program personnel periodically check compliance with the Reduction of Lead in Drinking Water Act by visual inspection and construction materials and documentation checks of the solder, pipe, fixtures and fittings being plumbed in new construction.
- o. Lead and Copper
 - i. Community water systems and non-transient, non-community water systems must collect samples from specific sites in the distribution system according to an established sample site pool to determine compliance with lead and copper action levels. The number of samples required varies with population and results received. Due to its complexity, any discussion of sampling must be directed to the regulations. Monitoring locations and frequencies are addressed in Title 179 Chapter 12-009.
- p. Radionuclides
 - i. The locations and frequencies for radionuclide monitoring are addressed in Title 179 Chapter 3-008.02A.
 - ii. Beta particle and photon radioactivity monitoring is addressed in Title 179 Chapter 3-008.02B.

B2 Sampling Methods Requirements

1. Procedures for Collecting Samples

Instructions on how to take samples are included with sample containers that are sent out from the PHEL. The sample collector must follow proper collection technique and

sampling instructions (see Attachment L) to ensure sample integrity. Compliance sample collectors are licensed water operators or persons who have been trained in proper sampling technique. Samples can be transported to the PHEL by common carriers, such as the U.S. Postal Service or the United Parcel Service, or may be hand delivered to the PHEL.

2. Equipment and Methods

Information pertinent to PHEL methods and equipment may be found in the attached PHEL QAPP. Acid, when used as a preservative, will be provided to the sample collectors by FS&T Program personnel for public water systems in their respective field areas. Upon receipt of the acid preservative, an affidavit will be completed and signed by the sample collector acknowledging receipt and instructions for the use of the acid. The affidavit will be signed by the FS&T field representative who will send it to the FS&T Program Manager who in turn will cause the affidavit to be kept in the public water system file in the DW office in Lincoln.

3. Receipt of Samples

PHEL policies and procedures regarding receipt and handling of samples may be found in Section 7 of the attached PHEL QAPP.

B3 Sample Handling and Custody Requirements

1. Ordering Samples

Orders from DW for public water system samples will typically be sent to the PHEL electronically. Orders may also be placed by telephone as specified in Section 7.1 of the PHEL QAPP.

2. Custody

PHEL policies and procedures regarding sample custody may be found in Section 7.3 of the PHEL QAPP.

a. Field Custody Procedures

- i. When DW personnel collect samples for investigative/enforcement purposes proper rules of evidence will be followed. For evidentiary procedures, a chain of custody form similar to the one shown in Appendix P of the PHEL QAPP will be used. All samples will remain the custody of the collector until transmitted to the PHEL; all sample custody records will remain with the samples at all times. If samples are mailed to the PHEL, custody procedure is to utilize certified or registered mail.
- ii. All custody samples for evidentiary purposes will be transported to the PHEL and brought to the attention of the Laboratory Quality Assurance Manager, primary analyst, or an alternate sample custodian. Samples will be handled in such a manner as to ensure the integrity of the samples.
- iii. To ensure that tampering has not occurred, chain of custody tampering seals will be used on the outside of the sample container. They will be

affixed in such a manner that the package cannot be opened without first breaking the seal.

- b. PHEL Custody Procedures
 - i. Policies and procedures relevant to PHEL sample custody may be found in Section 7 of the PHEL QAPP.

3. Sample Disposal

PHEL policies and procedures relevant to sample disposal may be found in Section 7.8 of the PHEL QAPP.

B4 Analytical Methods

1. Method Selection

Information relevant to approved analytical methodologies and proper method selection for sample analysis may be found in Section 14 of the PHEL QAPP.

2. Corrective Action

Information relevant to PHEL corrective actions regarding sample analysis may be found in Section 16 of the PHEL QAPP.

3. Allowable Methods

Information relevant to allowable sample analytical methods may be found in the PHEL QAPP.

B5 Quality Control

Information pertinent to quality control in the PHEL may be found in Section 11 of the PHEL QAPP.

1. Sampling Quality Control Checks

Information pertinent to PHEL quality control checks may be found in PHEL QAPP.

2. Analytical Quality Control Checks

Information pertinent to PHEL quality control checks may be found in the PHEL QAPP.

B6 Instrument/Equipment Testing, Inspection and Maintenance

1. Laboratory Equipment

Information pertinent to PHEL equipment testing, inspection and maintenance may be found in Section 10 of the PHEL QAPP.

2. DW Equipment

DW has limited field water sampling equipment that may be used for compliance monitoring. Equipment used for on-site monitoring for compliance purposes will be operated, maintained and calibrated in accordance with the manufacturers documented recommendations. A maintenance and calibration log will be maintained for each piece of testing equipment used for compliance purposes. Equipment used for compliance purposes includes fluoride test kits, chlorine residual test kits and pressure monitoring recorders. Only equipment with a documented maintenance and calibration record will be used for regulatory compliance purposes.

Maintenance of FS&T field test equipment will be performed by the FS&T Program Manager or personnel if so delegated by the Program Manager, following procedures specified in the instrument or equipment service manual.

B7 Calibration Procedures and Frequencies

1. PHEL Instruments and Equipment

Information relevant to PHEL instrument and equipment calibration requirements may be found in Section 10 of the PHEL QAPP.

2. DW Equipment

The specific procedures and frequencies for calibration of FS&T testing equipment is as outlined in B6.2. above.

B8 Inspection/Acceptance of Supplies and Consumables

1. PHEL Supplies

Information relevant to PHEL supplies may be found in Section 10 of the PHEL QAPP.

2. DW Supplies

Chemicals and reagents ordered for use in FS&T test equipment for compliance purposes will be inspected upon receipt for conformance with the equipment manufacturer's specifications prior to acceptance. Any irregularities identified upon inspection will be referred to the supplier or the FS&T Program Manager as appropriate. Use of FS&T test equipment for compliance purposes will not be initiated until any and all irregularities and inconsistencies are resolved.

B9 Non-Direct Measurements

The use of non-direct measurement sources of data is limited to preliminary indications of potential violations of Title 179. Preliminary indications based on non-direct measurement sources of data in historic databases and hard copy files will be confirmed by validated and verifiable data prior to compliance decisions.

Rationale for use of non-direct measurement data and confirmation procedures varies with the quality of the non-direct measurement data and the situation.

Validated and verified data direct the decisions made to determine compliance with Title 179 and to support the needs of principal and secondary data users.

B10 Data Management

1. Data Flow

Data will be produced in two locations; on-site at the public water system and at the PHEL or a lab that is certified and has entered into an agreement with DHHS. Data collected on-site is used by the system and/or is sent to DW for compliance determination. Examples of data collected on-site include turbidity, disinfectant residual, temperature, pH and flow. Regular calibration (per manufacturer's specifications) of field testing equipment is required per Title 179 Chapters 21-005 and 22-005. Data collected on-site must be submitted to DW on a regular basis for review and calculation of averages, where applicable. Calibration records must be available for inspection during sanitary surveys.

PHEL data is transferred electronically from the Laboratory Information Management System (LIMS) into the SDWIS database. Other means of data transfer from the PHEL to DW may be accomplished following consultation with DW.

DW identifies the appropriate analyses to be conducted. Necessary analyses are those required by Title 179 for contaminant monitoring of public water systems, by consulting with private citizens regarding drinking water quality concerns, or based on concerns noted during sanitary surveys. A request is sent electronically, or by other means, to the PHEL to ship the appropriate test kit, which includes sample collection and transit instructions, and a sample form that is to be completed by the sample collector (sample collection management). Samples for public water systems received at the PHEL are logged in, have a lab control number assigned, are analyzed within established U.S. EPA holding times, and the results are reported to DW and to the submitter. Distribution of data to data users will be accomplished as requested or required.

Data flow has been summarized in Attachment K.

2. Data Tracking and Storage

PHEL data tracking and storage are addressed in Section 8 of the PHEL QAPP. All of the completed public water system data is transferred daily from LIMS to the SDWIS database where it is retained for the time specified by federal regulation. The data format is based on the needs of U.S. EPA, and for reporting and retrieval purposes meeting the needs of our clients.

Data in the form of a report is retrieved from SDWIS by M&C Program personnel on a daily basis and reviewed by the rule managers for public water system monitoring and drinking water standards violations.

Data is generated quarterly for submittal to U.S. EPA indicating public water system violations, DW enforcement and follow-up activities.

Assessments

C1 Assessments and Response Actions

1. Assessments

- a. Systems Audits
 - i. Systems audits are qualitative reviews of project activity conducted annually under the direction and in the presence of the QAPP Manager to ensure that the overall quality assurance program is functioning adequately and the appropriate quality control measures are being implemented. This will include internal system reviews and/or performance audits of the PHEL as well as DW activities. U.S. EPA Region VII personnel conduct annual reviews of DW activities. The PHEL participates in these sessions on an as-needed basis.
- b. Internal Performance Audits
 - i. Information relevant to PHEL internal performance audits may be found in Section 15 of the PHEL QAPP.
- c. External Performance Audits
 - i. Information relevant to external audits of PHEL activities may be found in Section 15 of the PHEL QAPP.

2. Corrections

Information relevant to PHEL corrections may be found in Section 16 of the PHEL QAPP.

- a. **Responsibility to Initiate Corrections**
Information relative to initiating PHEL corrective actions is found in the PHEL QAPP.
- b. **Responsibility for Corrective Actions**
Information relative to taking PHEL corrective actions is found in the PHEL QAPP.

3. Other Corrective Actions

- a. In addition to the above, corrective action will be initiated when public water system water samples that indicate poor quality water sample collection practices are received by the PHEL for analysis. The PHEL will initiate corrective action by notifying DW of the problem and requesting their assistance in solving the problem. As necessary, DW will provide assistance to the public water system water sample collector to remedy the problem.
- b. M&C Program personnel evaluate data received from the PHEL in the daily report to identify inconsistencies in data. If inconsistencies appear, the M&C Program Manager is notified and that data is compared to historic data and other

resources as appropriate. See Attachment D. Corrective action will be initiated based on the presence of key indicators and/or the requirements specified in Title 179.

- c. It is the responsibility of all personnel assigned duties associated with QAPP to observe, note and report within 10 days to the M&C Program Manager any of the following:
 - i. New public water system, including reports of proposed systems,
 - ii. Any observed changes in the physical aspects of a system,
 - iii. Any change in ownership or responsibility for operation, maintenance or management; and
 - iv. Any other information pertinent to each system.
- d. When received, M&C Program personnel will immediately enter any changes of ownership names, titles and addresses into the SDWIS database.

C2 Reports to Management

1. PHEL

Information pertinent to PHEL reports and reporting requirements may be found in Section 2 of the PHEL QAPP.

- a. Coordination Meetings
 - i. The PHEL Quality Assurance Manager will, as needed or requested, schedule quality assurance meetings between DW personnel and PHEL personnel to discuss issues that arise relating to water quality monitoring requirements. The PHEL Quality Assurance Manager is responsible for preparing and distributing a written summary of these meetings to participating attendees.
- b. Quality Assurance Reports to Project Management
 - i. Information relative to PHEL quality assurance reports may be found in the PHEL QAPP.

2. DW

Reports will be prepared and distributed as outlined in the table below:

Actions	Dates
Prepare and submit quality assurance program status report by the QAPP Manager to the DW Administrator.	June 1, Yearly
QAPP Manager reviews QAPP with input from other participants involved in the project and recommends changes to the DW Administrator.	On-going
Department seeks approval from U.S. EPA for QAPP revisions.	On-going
Participation in sample performance or system audits.	On-going
Prepare and submit final QAPP report to all authorized parties and U.S. EPA which is to include a summary of the plan's accomplishments and deficiencies.	On-going

Every week, the Capacity Development Coordinator will prepare a report and deliver it to representatives of the 2% Capacity Development Technical Assistance Team. The report will detail public water systems that are approaching deadlines to correct, or provide a plan to correct deficiencies noted during the performance of sanitary surveys. A list of those public water systems with overdue corrections will also be provided the 2% Team for follow-up assistance.

Review, Evaluation of Usability, and Reporting Requirements

D1 Data Review, Verification and Validation

1. PHEL

Information relevant to PHEL data review, verification and validation activities may be found in Section 8.3 of the PHEL QAPP.

2. DW

- a. M&C Program personnel review daily information transferred from LIMS to SDWIS. This data is composed of analytical results of public water system water samples submitted on a routine basis. M&C Program personnel review the data to determine compliance with requirements for maximum contaminant levels and action levels. M&C Program personnel also review data sent in by system operators, such as disinfectant residuals and other measurements related to the Disinfectants/Disinfection Byproducts Rule and the Surface Water Treatment Rules. When irregularities and inconsistencies are identified, the M&C Program Manager is notified. Key indicators will be used by DW as a means to assure data received is of the required quality. The threshold for each indicator is the acceptable limit. If the threshold for a given indicator is exceeded, the M&C Program Manager, after consultation with DW personnel and the QAPP Manager as appropriate, will determine the need for corrective actions. This may also be done on a delegated basis working jointly with the M&C Program personnel. This process is addressed in Attachment G.
- b. Review of public water system coliform sample site plan submittals will be accomplished by the FS&T Program Manager. See Attachment H. The sample site locations will be verified as meeting the requirement for representative sample locations by use of established criteria. See Attachment I. If a public water system submittal does not meet the established criteria, a form letter will be sent to the public water system identifying the missing information and/or inconsistencies. See Attachment J. Title 179 Chapter 26-004.01A requires community public water systems to develop a written sample siting plan. These plans are subject to DW review and revision. Sample sites for all public water systems must be representative of water quality throughout the distribution system. For non-community public water systems whose distribution systems include only internal building plumbing, sample sites must be representative of locations within the building where drinking water is normally obtained. Title 179

Chapter 3-004.01A includes all sample site plan requirements for coliform monitoring. See Attachment F.

- c. DW personnel look for the following indicators of situations that require follow-up for data verification:
 - i. A public water system not following elements established in an escalation policy.
 - ii. Data that appears to indicate a public water system with a non-violation record is to be classified in significant non-compliance.
 - iii. Data that is consistently low or high compared to the state's total data accumulated for a parameter.
 - iv. Reports of illness that correlate with maximum contaminant level violations.
 - v. Reports of taste and odor that correlate with maximum contaminant level violations.
 - vi. Two sampling periods for a public water system within a year for which one or more microbiological samples arrived at the PHEL too late to be examined or 5% of all coliform samples for all public water systems.
 - vii. Two sampling periods within a year for which one or more sample containers submitted by a public water system were leaking when received by the PHEL or the sample containers were insufficiently filled.
 - viii. Sampling plan not followed at least 15% of the time during the previous year by a public water system and 10% by all public water systems in any field area.
 - ix. Inconsistent results for a public water system and inconsistent results for a field area as compared to other public water systems and field areas.
 - x. A public water system not following a variance or exemption compliance schedule.
- d. The FS&T Program Manager will evaluate results of completed sanitary surveys on at least a quarterly basis for uniformity of regulatory application by FS&T Program personnel and completeness. Individual coded entries into SDWIS identify deficiencies as regulatory in nature or only recommendations. As irregularities in sanitary survey report reviews are noted, either the FS&T Program personnel for the respective field areas or the FS&T Program Manager initiates and makes corrections to the data in the SDWIS database.

D2 Verification and Validation Methods

1. PHEL Methods

Information relative to PHEL verification and validation methods may be found in Section 11 of the PHEL QAPP.

2. DW Methods

M&C Program personnel review the data for LIMS inaccuracies and inconsistencies. Irregularities identified on the daily report are referenced to the appropriate rule manager for confirmation. Comparability of data will be initiated; comparison to historical data at the site and consultation with the FS&T Program Manager and/or respective FS&T Program personnel as appropriate. Identification, if possible, of a sample location error or

sampling technique error will invalidate that data in question, as prescribed in Title 179. Standardized sampling protocol and analytical techniques with similar reporting limits help ensure comparability. See Attachment G.

Data is retrieved from SDWIS and transferred electronically to U.S. EPA on a quarterly basis. After generation of the draft quarterly report, M&C Program personnel will perform a review of the data prior to it being submitted to U.S. EPA. Review will consist of confirmation that the reportable data meets U.S. EPA required needs and stated data requirements for the project. The M&C Program Manager will be consulted on unresolved data issues prior to submittal of the quarterly report to U.S. EPA.

Other than non-regulatory purposes of data use, criteria for acceptable data is prescribed by state and federal regulations.

D3 Reconciliation With User Requirements

Because this project requires the use of data for regulatory reporting and enforcement purposes, only valid and defensible data will be reported to clients. This QAPP is intended to reference, describe and explain an integrated system of management activities involving planning, implementation, assessment, reporting and quality improvement to ensure that processes, items and services covered herein are of the type and quality needed and expected by DW and where applicable, U.S. EPA. The project use of sound science-based analytical methodologies and laboratory quality assurance provides reliable and meaningful data without which, decisions on compliance with the drinking water standards could not be derived.

If the data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling will occur. Depending upon the monitoring requirements outlined in Title 179, such an occurrence may result in a decision initiating an enforcement action.

If PHEL equipment failure negates the ability to perform analyses on public water system compliance samples, the PHEL will contract that work out to other laboratories that meet the requirements for public water system compliance sample analysis. This is addressed in Section 8.1 of the PHEL QAPP.

If the cause of the failure is identified as originating at the PHEL, analysis, calibration and maintenance needs will be reassessed as identified by the appropriate PHEL personnel. This is addressed in Section 16 of the PHEL QAPP. If a problem is found to be related to the public water system sample collection process and protocols, retraining will be provided and protocols revised if needed.

Public water system monitoring requirements include specified time frames for sample collection. Failure to collect samples within the specified time frames will result in a reportable monitoring violation. The collection of additional samples by a public water system is a time critical issue due to the established monitoring time frames.

Any limitation on data use will be detailed in reports issued to data users.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

11201 Renner Boulevard
Lenexa, Kansas 66219

SEP 28 2017

COPY

MEMORANDUM

SUBJECT: Draft Public Water Supply Supervision Program - Quality Assurance Project Plan - Reviewed

FROM: Diane Harris, Regional Quality Assurance Manager
Environmental Sciences and Technology Division

TO: Ken Deason, Task Order Project Manager
Drinking Water Management Branch
Water, Wetlands, and Pesticides Division

The review of the subject draft document prepared by Nebraska Department of Health and Human Services Division of Public Health Environmental Health Unit Office of Drinking Water and Environmental Health and revised August 2018 has been completed according to the "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," EPA QA/R-5 March 2001. The Nebraska Department of Health and Human Services Public Health Environmental Laboratory Quality Assurance Plan (PHEL QAPP), dated October 2014 (revised December 2017), included as Attachment A, was also reviewed in terms of how it related to and supported the QAPP. The QAPP was reviewed against the comments outlined in the previous QA review memo dated October 26, 2016 (RQAO Document 2016195) which was for the April 2016 revision of the subject document.

Because the document was unsigned, it was reviewed as a draft and the comments are outlined below. Critical comments identify issues which need to be addressed before the document can be approved. General comments identify opportunities for strengthening the document, but do not affect approval.

Critical Comments

1. Signature Page. Once the document is ready for final approval, it will need to be submitted to QA with the appropriate signatures.

General Comments

2. The specific sections in the PHEL QAPP or chapters in Title 179 should be identified for the following sections.
 - PHEL QAPP:
 - Section A6.2 Description of Work Performed, page 14. Key indicators that are used to assure data regarding the above water quality parameters is of acceptable quality.
 - Section A8.2 Public Water System Sample Collectors, page 17. Sample collection instructions based on sample collection protocols prescribed by the analytical methods and sample location requirements cited in state and federal public water system



- regulations.
 - Section B2.2 Equipment and Methods, page 26. Information pertinent to PHEL methods and equipment.
 - Section B4.3 Allowable Methods, page 27. Information relevant to allowable sample analytical methods.
 - Title 179:
 - Section A7.2 Data Quality Indicators, page 15. The collection of representative water samples for public water systems.
3. Section A9 Documents and Records references the PHEL QAPP, however, since additional information was found in Title 179 and the Federal Regulations, perhaps these documents should also be addressed.
4. Attachment A: PHEL QAPP Comments:
- Section 1.2 page 8:
 - Manual for the Certification of Laboratories Analyzing Drinking Water, Fifth Edition, January 2005 also has two Supplements:
 - 1: EPA 815-F-08-006, June 2008
 - 2: EPA 815-F-12-006, Nov. 2012
 - Section 8.0 page 27:
 - Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-932 should be EPA 600/4-80-032, Aug. 1980
 - Eastern Environmental Radiation Facility Radiochemistry Procedures Manual EPA-600/4-80-032 should be EPA 520/5-84-006 June 1984
 - Manual for the Certification of Labs Analyzing Drinking Water Fifth Edition, EPA 815-R-05-004 January 2005 also has Supplement 2: EPA 815-F-12-006, Nov. 2012.
 - Section 11 page 38:
 - The internal quality control SOPs that are being reference should be identified.

If you have any questions, please contact Erin Trainor, Lead Reviewer, at x7764 or me at x7258.

R7QAO Document Number: 2018208

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CONCURRENCE: Sappington:7771:092618:H/ENST/IO/QA/Trainer/2018/2018208.mem.docx				
DIV/BR	ENST/QA	ENST/QA	ENST/QA	
NAME	Trainer	Harris	Tapp	
DATE	09/28/2018	09/28/2018	9/28/18	
INITIALS	DEH	DEH	MOB	

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