



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Knoxville Environmental Field Office
3711 Middlebrook Pike
Knoxville, TN 37921
Phone 865-594-6035 Statewide 1-888-891-8332 Fax 865-594-6105

August 1, 2016

Mr. Dean Harshbarger, Chairman of the Norris Water Commission
City Offices on Chestnut Drive
P.O. Box 1090
Norris TN 37828

RE: **Sanitary Survey of Community Water System**
Norris Water Commission Water System
PWSID #0000513
Anderson County

Dear Mr. Harshbarger:

On June 9 and 10, 2016, Richard Lambert and Hassan Sanaat from the Division of Water Resources (the Division) visited the Norris Water Commission Water System and performed a Sanitary Survey. The sanitary survey consisted of records reviews to document the operational performance of the system and inspections of the water treatment plant and distribution system. The sanitary survey covered the time period from May 2014 to June 2016. An inspection of the water treatment plant [WTP]'s filter backwash discharge permit was also conducted during the same time period, but the result of the filter backwash permit inspection will be reported in a separate letter. The Division would like to thank Mr. Tony Wilkerson and Mr. Dustin Babb, and other water system staff for their courtesy, willingness to work with the Division, and timely responses to Division requests. In accordance with the Division's Sanitary Survey Manual the Norris Water Commission drinking water system earned 593 points out of a possible 599 points for a numerical score of ninety-eight percent (98%). This rating retains the County Water System in the State's "**Approved**" category.

The following deficiencies, comments, and/or recommendations as outlined in the attached Sanitary Survey Rating Form were identified during the survey and should be addressed as applicable:

1. Section 1: System Management and Operation

• **Subsection A. Record Keeping**

During this survey period, the majority of the water system's water quality records were available for survey review. Requests for records are identified in a few appropriate sections below.

As discussed during the survey, the Environmental Protection Agency has revised the Total Coliform Rule, now identified as the Revised Total Coliform Rule (RTCR). The RTCR became effective in Tennessee on March 31, 2016, and the water system revised its Bacteriological Site Sampling Plan (BSSP) to indicate how the system will comply with the RTCR. The water system is requested to send a copy of its revised BSSP to The Division's Knoxville Field Office for the Division's Norris Water System Knoxville facility file.

- **Subsection H. Emergency Operations Plan (EOP)**

As a reminder, Norris Water Commission must update both its EOP and its Drought Management Plan every two years or as significant changes occur, and submit a copy of the updated plans to the Division for its review. A copy of the system's updated EOP was received during July 2016 for review. The water system is requested to also send a copy of its revised Drought Management Plan to The Division's Knoxville Field Office.

2. Section 3: Source

- **Subsection C. Wellhead/Spring box Construction**

The Norris raw water source is Clear Creek Spring. Because a beaten trail around the source spring box's fenced enclosure verifies the frequency that hikers stop to view the spring box, the water system is recommended to notify or warn the visitors that they are in a water protection zone. A notification can be made by posting signs on each end of the fenced enclosure that surrounds the spring box.

- **Subsection D. Source Protection Plans**

The water system is reminded that its surface water source assessment update is due to be submitted before December 31, 2016, and to always submit a copy of its source water assessment update to the DWR Nashville Central Office for review. Send a courtesy copy to The Division's Knoxville Field Office and an original copy to the Division's Nashville Central Office to the attention of David Grief at the following address:

David Grief, DWR 11th Floor William R. Snodgrass Tennessee Tower,
312 Rosa L. Parks Avenue, Nashville, TN 37243

Note that David Grief's office phone number is (615) 532-0174.

In addition, the water system is reminded to "annually update its contaminant source inventory of significant potential contaminant sources which may have any adverse effect on the health of persons and potential contaminant sources within the source water protection area. The contaminant source inventory and subsequent updates for surface water based systems shall include the notifications roster, response committee designees and other portions of the emergency operations plan pertaining to source water protection implementation. The contaminant source inventory with the required information from the emergency operations plan shall be submitted to the Department and be available for inspection during subsequent sanitary surveys or other inspections."

3. Section 4: Treatment.

- **Subsection O. Backwash Handling/Sludge Handling**

The WTP has not yet had to store backwash sludge. The water system is reminded to minimize sludge laden water from being transported back to the river from its backwash detention pond, plan for future backwash sludge removal and storage, and prevent dried sludge from being removed from the site in the future until the water system has been approved for beneficial sludge use by TDEC. To submit a Beneficial Use Request the system should inquire of The Division's Knoxville Field Office or contact the Solid Waste Division's Paula Plont (865)594-5474 or Revendra Awasthi (865)594-5468.

4. Section 5: Monitoring, Data Verification and Compliance

- **Subsection B. Bacteriological Monitoring**

As discussed during the site visit, the water system is notified that the RTCR has revisions concerning the requirements for bacteriological compliance sampling. In particular, the Norris Water Commission Water System is reminded to designate future bacteriological samples for repairs as Special (S) samples (and not as D-compliance samples).

- **Subsection G. Primary Chemicals Monitoring**

The system is reminded to complete its 2016 monitoring for Nitrates and Radionuclides by December 31, 2016.

The 2014-2016 Chemical Monitoring Waivers/Schedules for the Norris Water Commission require that Norris must monitor quarterly for fluoride. The deficiency of not monitoring all quarters of 2015 resulted in the deduction of **three (3)** of the rating points available for this survey.

- **Subsection O. Cryptosporidium Monitoring**

A Long Term 2 Enhanced Surface Water Treatment Rule (LT2) letter of January 5, 2010 from the Knoxville Field Office classified the system in Bin-1 for E-Coli/Cryptosporidium treatment. The 2010 letter notified Norris Water Commission that it will be required to begin a second round of source water monitoring for E-Coli/Cryptosporidium beginning October 1, 2017. LT2 monitoring plans are due three months prior to the start of monitoring. With a start date of 10/01/2017, the system's LT2 monitoring plan will likely be due by July 1, 2017. Additional information may be sent to you as the 2017 start date nears.

5. Section 8: Distribution System and Cross Connection Controls

- **Subsection E. Map of Distribution System**

The water system updated its distribution map in January 2013 and provided a copy to The Division. The system is reminded to update its distribution map at least once every 5 years and submit a copy to DWR Knoxville Field Office.

- **Subsection G. Working Cross Connection Program**

The water system conducted and adequately documented that it conducted the required annual maintenance of all of its backflow preventers, but records for conducting searches for potential cross connections within its distribution system were insufficient for this survey period. A Cross Connection Program deficiency exists when a system has insufficient documentation of conducting surveys and resurveys of new and existing customer sites for the detection and elimination of

potential hazards. This deficiency resulted in the deduction of **three (3)** of the rating points available for this survey.

- **Subsection H. Unaccounted Water Loss**

The system is reminded to continue to develop its distribution water loss accountability and water loss record keeping program.

General Observations, Comments, and Other Recommendations

1. Norris Water Commission Water System has 860 connections serving an estimated customer population of 2,064. The number of required bacteriological samples to be taken from the distribution system each month remains at two (2) per month.
2. A routine Monitoring Program that is in accordance with Rule 0400-45-01-0.17(3) is enclosed for the system.
3. In accordance with Rule 0400-45-01-.14(1)(a), State approval for the analysis of turbidity, free chlorine residual, temperature, pH, alkalinity, and Fluoride is hereby granted to Tony Wilkerson and those under his direct supervision. This approval is effective until the next sanitary survey and is contingent upon use of approved methodologies and proper operation of the analysis equipment.

Again, I would like to thank the Norris Water Commission Water System personnel for their assistance and courtesy. If you have any questions or need additional information, please contact me at the Knoxville Field Office. My telephone number is (865) 594-5565, or contact Robert Ramsey, DWR Knoxville Field Office Facilities Unit Manager at (865) 594-5515.

Sincerely,



Richard Lambert, P.E. | Environmental Protection Specialist
Division of Water Resources
Knoxville Field Office
p. 865-594-5565
Richard.Lambert@tn.gov

cc: TDEC Nashville Central Office, Division of Water Resources, Water Quality Branch,
11th Floor, William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue,
Nashville, TN 37243

Knoxville Environmental Field Office, Division of Water Resources correspondence file
for Norris Water Commission Water System (PWSID 0000513)

Mr. Tim Hester, Norris City Manager, City Offices on Chestnut Drive, P.O. Box 1090,
Norris, TN 37828

Mr. Tony Wilkerson, Water & Waste Water Superintendent, Norris Water Commission
Operations Center, P.O. Box 1090, Norris, TN 37828

Sanitary Survey Rating

 PWSID: TN0000513

 Water System Name: Norris Water Commission Water Service

 Survey Date: Jun 9, 2016

 System Category (Points): 599

 421 - Consecutive Systems/Distribution Only
 488 - Treatment Systems/Wholesalers
 599 - Both Treatment and Distribution

1. System Management and Operation (94)

Requirement	Points Range	Deduction	Comments
A. Record Keeping 0400-45-01-.20	(0)	Narrative	Requesting copy of 2016 Bacteriological Site Sampling Plan be sent to Knoxville FO
B. Construction Projects 0400-45-01-.05, 0400-45-01-.17	(1-5)	0	
C. Submission of Monthly Operations Reports 0400-45-01-.17	(0)	Narrative	Requesting March & April 2016 MOR copies
D. Reporting Requirements 0400-45-01-.18	(4-30)	0	
E. Public Notification 0400-45-01-.19	(3-10)	0	
F. Facility Maintenance Fee	(0)	Narrative	No narrative needed.
G. Enforcement – TCA §68-221-701 et seq.	(4-10)	0	No enforcement in the survey period.
H. Emergency Operations Plan 0400-45-01-.17	(3)	0	2016 EOP update is currently under review by DWR
	Deficiency Subtotal	0	

2. Operator Compliance (23)

Requirement	Points Range	Deduction	Comments
A. Certified Operator – Plant and Distribution System 0400-45-01-.17(1) and 0400-49-01-.04	(3-15)	0	
	Deficiency Subtotal	0	

3. Source (25)

Requirement	Points Range	Deduction	Comments
A. Source Adequacy 0400-45-01-.02, .05, .16, .17(13) and .34(3)	(3-5)	0	
B. Intake 0400-45-01-.05, .17	(2)	0	
C. Wellhead/Springbox Construction 0400-45-01-.05(12), .16 and .17(3) and (16)	(2)	0	See Narrative recommendation about signs
D. Source Protection Plans 0400-45-01-.34	(1-2)	0	Reminder that source assessment update is due by end of this year
	Deficiency Subtotal	0	

4. Treatment (153)

<u>Requirement</u>	<u>Points Range</u>	<u>Deduction</u>	<u>Comments</u>
A. Aerator 0400-45-01-.05, .17	(2)	0	n/a
B. Chemicals/Chemical Feeders 0400-45-01- .05(8), and .17, .36	(2)	0	
C. Mixing 0400-45-01-.02, .05, .17	(2)	0	
D. Flocculation 0400-45-01-.02, .05, .17	(2)	0	No Flocculation basin
E. Sedimentation 0400-45-01-.02, .05, .17	(2)	0	No Sedimentation basin
F. Filtration/Alternative Technology 0400-45-01-.17(12) and (27)	(2-30)	0	
G. Re-wash/Filter-to-waste 0400-45-01-.17 (35)	(2)	0	
H. Turbidimeters/Calibration 0400-45-01-.05 (11).17, .31, .39	(2-4)	0	
I. Disinfection 0400-45-01-.02, .17, .31, .36	(2-30)	0	
J. Disinfection Contact Time 0400-45-01-.02, .17, .31	(2-4)	0	
K. Master Meter 0400-45-01-.17 (2) and (3)	(1-2)	0	
L. Maintenance of Equipment, Buildings and Grounds 0400-45-01-.02, .17(3), (17) and (19)	(1)	0	
M. Laboratory Facilities 0400-45-01-.02, .14, .17(3)	(1-3)	0	
N. Safety 0400-45-01-.02	(2)	0	
O. Sludge Handling/Backwash Handling 0400-45-1-.05	(2)	0	
P. Sanitary Conditions 0400-45-01-.17 (17)	(2)	0	
Q. Fluoridation Techniques 0400-45-01-.06, .12, .17	(2)	0	
R. Design Capacity 0400-45-01-.05 (10)	(2-4)	0	
S. Filter Backwash Recycling 0400-45-01-.31 (9)	(1)	0	n/a
	Deficiency Subtotal	0	

5. Monitoring, Data Verification and Compliance (175)

Requirement	Points Range	Deduction	Comments
A. Laboratory-Process Monitoring (excluding Turbidity and Chlorine Residual) 0400-45-01-.17(3)	(5)	0	
B. Bacteriological Monitoring	(2-6)	0	See narrative reminder and narrative conclusion.
C. Bacteriological Compliance 0400-45-01-.06	(4-7)	0	
D. Turbidity Monitoring	(2-3)	0	
E. Turbidity Compliance	(4-7)	0	
F. Chlorine Residual Monitoring 0400-45-01-.17, .31, .36	(2-3)	0	
G. Primary Chemicals Monitoring	(2-3)	3	See narrative reminders, and note Fluoride monitoring incomplete during 2015
H. Primary Chemicals Compliance	(4)	0	
I. Lead and Copper Monitoring 0400-45-01-.33	(2-3)	0	See narrative reminder
J. Lead and Copper Action Level 0400-45-01-.33	(3-5)	0	
K. Disinfection/Disinfection By-Products and Precursors Monitoring 0400-45-01-.36, .37, .38	(2-3)	0	See narrative reminder
L. Disinfection/Disinfection By-Products and Precursors Compliance 0400-45-01-.06, .36	(2-30)	0	
M. Secondary Chemicals 0400-45-01-.12	(2)	0	
N. Secondary Chemicals Compliance 0400-45-01-.12	(3)	0	
O. Cryptosporidium Monitoring 0400-45-01-.39	(0)	Narrative	Begin second round of Cryptosporidium monitoring in 2017
	Deficiency Subtotal	3	

6. Finished Water Storage (25)

Requirement	Points Range	Deduction	Comments
A. Adequate Storage 0400-45-01-.17 (14)	(2-4)	0	
B. Inspection and Maintenance of Reservoirs, Tanks and Clearwell 0400-45-01-.17 (16), (17), (33) and (34)	(1-10)	0	
	Deficiency Subtotal	0	

7. Pumps, Pump Facilities and Controls (18)

Requirement	Points Range	Deduction	Comments
A. Pump Facilities 0400-45-01-.17 (9) and (13)	(1-4)	0	
B. Maintenance of Pumping Equipment 0400-45-01-.17(13)	(1-3)	0	
	Deficiency Subtotal	0	

8. Distribution System and Cross Connection Controls (86)

Requirement	Points Range	Deduction	Comments
A. Notification, Inspection, Disinfection and Sample Collection of New or Existing Facilities 0400-45-01-.17 (8) and (19)	(3-5)	0	
B. Flushing Program/Blow Offs 0400-45-01-.17(10) and (23)	(3-4)	0	
C. Fire Hydrants 0400-45-01-.17 (18)	(0)	Narrative	No comment needed.
D. Adequate Pressure 0400-45-01-.17 (9)	(5)	0	
E. Map of Distribution System 0400-45-01-.17 (15)	(3)	0	See narrative reminder
F. Approved Cross Connection Policy or Ordinance and Plan 0400-45-01-.17 (6)	(4)	0	
G. Working Cross Connection Program 0400-45-01-.17(6)	(3-9)	3	See narrative about searches for potential cross connections
H. Unaccounted Water Loss	(0)	Narrative	See narrative
	Deficiency Subtotal	3	

Total Deficiency Points: 6

Points Available: 599

Overall Rating: 98

Points Available

421 - Consecutive Systems/Distribution Only

488 - Treatment Systems/Wholesalers

599 - Both Treatment and Distribution

Inspector: Richard Lambert



Additional Comments/Explanations:

See the August 01, 2016 sanitary survey report for a narrative of explanations and comments relative to the current survey findings. See Tennessee's Sanitary Survey Manual for explanations and comments regarding the rating categories and procedures.

There are 599 possible rating points available for a water system with both treatment and distribution. Since six (6) points were deducted for deficiencies in this survey, the calculated rating would be $593/599 \approx 98\%$. The Tennessee Sanitary Survey Manual only allows reporting of the whole number portion of the calculated rating.

DRINKING WATER MONITORING PROGRAM
Norris Water Commission Water System
For Water Treatment 2 / Distribution System 1
PWSID #0000513, Anderson County
August 2016

The following Drinking Water Monitoring Program has been developed in accordance with Division Rules 0400-45-01-.07 and 0400-45-01-.17(3). Unless otherwise noted, all results must be reported on the Monthly Operations Report (MOR). Please place this monitoring program in an easily accessible location for water system personnel to review.

I. Raw Water

Unless otherwise noted, collect a representative sample **daily** prior to any chemical additions and analyze for the following:

1. Temperature
2. Turbidity
3. Alkalinity (Total)
4. pH
5. Fluoride (Once a Week)
6. Hardness (Once a Week)
7. Jar Test (as needed to optimize treatment and enhance coagulation)

II. Settled/Pre-filtered Water

Collect a representative sample before filtration **daily** and analyze for the following:

1. Chlorine residual (free)

III. Finished Water

Collect a representative sample after filtration **daily** and analyze for the following:

1. Turbidity – continuous monitoring, reporting highest level for each four-hour block from all generated data.
2. Chlorine residual (free), continuous, reporting lowest daily measurement on MOR from all data generated.
3. Alkalinity (Total)
4. pH
5. Fluoride
6. Hardness (Once a Week)

IV. Distribution System

A. Unless otherwise noted, while in operation collect a **daily** representative sample from dead-end or low usage lines (chlorine sample locations must be reported in or with the MOR) minimum of five (5) days per week, excluding holidays, and analyze for the following:

1. Chlorine residual (free)
2. Fluoride

B. Bacteriological

1. A minimum of two (2) samples are to be collected each month and analyzed by a State Certified Laboratory. Chlorine residual must be collected at the same time and same frequency as that of the bacteriological samples.
2. The Revised Total Coliform Rule (RTCR) became effective March 31, 2016 and requires that samples collected for repairs will be special samples and not be compliance samples. The RTCR requires that the quantity and location of collected bacteriological samples be specified in the system's Bacteriological Site Sampling Plan.