



Drinking Water & Groundwater PROGRAM GUIDANCE

Wisconsin Department of Natural Resources
101 S. Webster Street, P.O. Box 7921
Madison, WI 53707-7921

Guidance Concerning Total Coliform/*E.Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

June 20, 2023

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

Applicability:

This guidance is for situations where all the following apply:

1. A Level 2 assessment is triggered at a municipal community drinking water system that does not continuously disinfect on a year-round basis,
2. The Level 2 assessment identifies no likely cause of the Level 2 trigger, and
3. Water quality data for the system documents a history of total coliforms or *E. coli* in the drinking water, indicating a potential health hazard.

Background:

In 2013, EPA promulgated the Revised Total Coliform Rule which establishes requirements for assessments and corrective action when monitoring results show that public water systems may be vulnerable to microbiological contamination. In 2016, DNR adopted these requirements within ch. NR 809, Wis. Adm. Code.

The intent of the assessment and corrective action portions of the Revised Total Coliform Rule is to “find and fix” the problem. Section NR 809.313, Wis. Adm. Code, describes the requirements, process, and corrective actions for the assessments and corrective actions.

Total coliforms are a group of related bacteria that are (with few exceptions) not harmful to humans. A variety of bacteria, parasites and viruses, known as pathogens, can potentially cause health problems if humans ingest them. EPA considers total coliforms a useful indicator of other pathogens for drinking water. Total coliforms are used to determine the adequacy of water treatment and the integrity of the distribution system.

Research conducted in Wisconsin and Minnesota suggests that populations served by groundwater-source systems without disinfection may be exposed to waterborne viruses and consequent health risks. Minnesota’s ongoing “Pathogen Project” seeks to understand and reduce the public health risk from pathogens in groundwater. In addition to investigating the sources and pathways of pathogen contamination, this study is examining the timing of pathogen contamination relative to groundwater recharge events that may be affected by climate change, such as precipitation or snowmelt.

Impacts to Wisconsin’s water resources due to climate change are documented in the 2021 WICCI Assessment Report. Climate change impacts such as extreme weather events may adversely affect groundwater water quality. Public water systems without continuous disinfection as a barrier to pathogens may be particularly vulnerable to such effects of our changing climate.

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

As of 2022, there are forty-nine (49) municipal community drinking water systems in Wisconsin that do not continuously disinfect year-round. Our data system indicates that eight (8) of these systems have no recent history of total coliforms in their drinking water.

Authority:

S. 281.17(8), Wis. Stats.

(a) The department may establish, administer and maintain a safe drinking water program no less stringent than the requirements of the safe drinking water act, 42 USC 300f to 300j-26.

(b) Notwithstanding par. (a) and s. [280.11 \(1\)](#), the department may not require a municipal water system to provide continuous disinfection of the water that it provides, unless one of the following applies:

1. Continuous disinfection is required under federal law.
2. Water quality data, well construction, or water system construction indicate a potential health hazard.

S. NR 809.313(1), Wis. Adm. Code

TREATMENT TECHNIQUE TRIGGERS. Water suppliers of public water systems shall conduct assessments in accordance with [assessment requirements] after public water systems exceed treatment technique triggers in par. (a) or (b).

(a) *Level 1 treatment technique triggers.*

1. For public water systems taking 40 or more samples per month, the public water system exceeds 5.0% total coliform-positive samples for the month.
2. For public water systems taking fewer than 40 samples per month, the public water system has two or more total coliform-positive samples in the same month.
3. The water supplier fails to take every required repeat sample after any single total coliform-positive sample.

(b) *Level 2 treatment technique triggers.*

1. An *E. coli* MCL violation, as specified in s. NR 809.30.
2. A second Level 1 trigger as defined in par. (a) within a rolling 12 month period, unless the department has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

total coliform-positive and has established that the water supplier has corrected the problem.

3. For public water systems with approved annual monitoring, a Level 1 trigger in two consecutive years.

Definitions:

“Level 1 assessment” means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and, when possible, the likely reason that the system triggered the assessment. It is triggered by total coliform detections under s. NR 809.31. It is conducted by the system operator or owner. s. NR 809.04(47g), Wis. Adm. Code.

“Level 2 assessment” means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and, when possible, the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system, including the system’s monitoring and operational practices, than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the department, which may include the system operator. s. NR 809.04(47r), Wis. Adm. Code.

Additional guidance to support DNR staff conducting Level 1 and 2 assessments is available in s. 2.8, Public Water Supply Operations Handbook, and in the Appendix to s. 2.8 Additional RTCR Assessment Training.

“Sanitary defect” means a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place. s. NR 809.04(71m), Wis. Adm. Code.

Guidance:

Prior to conducting the Level 2 assessment, the DNR Rep reviews the water quality data history and any prior Level 2 assessments conducted at the water system and any subsequent corrective actions. Initial consultation with colleagues, including the Field Supervisor, is encouraged. Note, samples that are not representative of water served to consumers are not the basis for Level 2 assessment corrective actions. For example, samples associated with isolated new construction or for water not available for consumption would not be relevant.

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

The DNR Rep conducts the Level 2 assessment site visit(s) in consultation with the water system representative(s). See s. 2.8.8 and Appendix to 2.8 of the Public Water Supply Operations Handbook for guidance on how to conduct the Level 2 assessment. Note, consideration of potential laboratory or sampling error is included in the Level 2 assessment, see Section D. Monitoring Observations, Form 3300-312. Additional investigative sampling may be helpful, such as adenosine triphosphate (ATP), most probable number (MPN), heterotrophic plate count (HPC), microbial DNA analysis, and large volume hollow fiber ultrafiltration (HFUF) sampling. Additional detail on investigative sampling strategies is available in Appendix to 2.8, Public Water Supply Operations Handbook.

In some situations, the Level 2 assessment will not identify a likely cause of the Level 2 trigger. On a case-by-case basis, the DNR Rep should consider identifying the persistent total coliform-positive or *E. coli* samples as a sanitary defect that indicates a failure in a barrier to contamination. The DNR Rep should consider the water system's historic data and the information gathered during the Level 2 assessment to determine whether continuous disinfection is an appropriate required corrective action to address a potential health hazard. If the DNR Rep believes, based on their best professional judgement, that continuous disinfection is needed to address a potential health hazard, the DNR Rep should consult with the RTCR Coordinator, Field Supervisor, Field Operations Director, and Program Director, to reach a decision.

The DNR Rep documents the findings and decision on the Level 2 Assessment Form 3300-312. (Note, DNR plan approval and start-up authorization are required prior to conducting continuous disinfection, per s. NR 811.08(2) and s. NR 810.26(1), Wis. Adm. Code.) In consultation with the water system representative, the DNR Rep sets the deadline(s) for corrective action(s).

If requiring continuous disinfection is appropriate, the DNR Rep documents the analysis and basis for the decision to require continuous disinfection and the corrective action schedule in a cover letter to the Level 2 Assessment Form. A template cover letter is provided below.

The DNR Rep then formally notifies the water system representative of the findings and decision.

The DNR Rep enters the Level 2 Assessment findings and decision into DWS (drinking water data system) and uploads the completed Level 2 Assessment Form and cover letter into OnBase. The DNR Rep monitors the water system progress on corrective action(s) and provides technical assistance as needed.

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

[Insert Letterhead]

[Date]

[Owner]

[Water System Name]

[Owner address]

PWSID#: [ID]

System Type – County: [Type – County]

SUBJECT: Level 2 Assessment Corrective Action Plan and Schedule

Dear [owner] :

Pursuant to s. NR 809.313, Wis. Adm. Code, the Wisconsin Department of Natural Resources, Division of Environmental Management, Bureau of Drinking Water and Groundwater, has determined that corrective action to address [total coliform/*E. coli*] contamination is required at [water system name], based on the recent Level 2 Assessment. The department has considered the water quality data, well construction, and water system construction and determined that the existing sanitary defects create a potential health hazard. The department determination, corrective action plan, and schedule are provided below.

Date of Level 2 Assessment: [Date]

Level 2 Assessment Conducted By: [Name, Title, Mailing Address, Email Address, Phone Number]

System Description: [Provide a brief description of the water system.]

Analysis and Determination: [Describe the current Level 2 assessment trigger(s). Describe the history of total coliform/*E. coli* contamination, prior Level 1 and 2 assessments and corrective actions. Describe the basis for determination, including any facts relevant to the risk to public health. State the determination (E.g. The Department determines that these facts indicate a potential health hazard and requires continuous disinfection as the required corrective action).]

Proposed Corrective Action Plan and Schedule:

As required under s. NR 809.313(3), Wis. Adm. Code, the water supplier shall complete the corrective action(s) in compliance with the timetable below. The water supplier may request additional time with justification. Please contact me to discuss this by [Date].

The water supplier shall notify the department when each scheduled corrective action is completed.

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Public Water Supply Operations Handbook

Appendix to 2.8.8 – Guidance Concerning Total Coliform/*E. Coli* Contamination at Municipal Public Water Systems Without Year-Round Continuous Disinfection

Corrective Action	Corrective Action Deadline	Code Citation
Submit to the Department plans and specifications for continuous disinfection.	[Within XX days of this letter.]	s. NR 811.08, Wis. Adm. Code
Complete installation of equipment necessary for continuous disinfection. Notify DNR Rep and request start up authorization.	[Within XX days of plan approval.]	s. NR 809.313(3), Wis. Adm. Code
Begin continuous disinfection.	[Within X days after DNR start up authorization.]	s. NR 810.26(1), Wis. Adm. Code
Submit monthly operation report.	No later than the 10 th day of first month following start of continuous disinfection, and every following month.	ss. NR 108.06(4), 810.07, Wis. Adm. Code

Appeal rights: If you believe that you have a right to challenge this decision, you should know that the Wisconsin Statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. Requests for contested case hearings must be made in accordance with ch. NR 2, Wis. Adm. Code. Filing a request for a contested case hearing does not extend the 30-day period for filing a petition for judicial review. For judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you must file your petition with the appropriate circuit court and serve the petition on the Department within 30 days after the decision is mailed. A petition for judicial review must name the Department of Natural Resources as the respondent.

Sincerely,

[Name]
[Title]

Encl. (Form 3300-312)

Disclaimer: This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.