



**Guidance on Total Coliform  
Bacteria Monitoring for Small Public  
Water Systems (Population Less  
Than 3,301 Persons)**

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**I. PURPOSE:**

The purpose of this guidance is to explain the total coliform monitoring requirements found in rules 3745-81-50 through 3745-81-55 of the Ohio Administrative Code and assist small public water systems (PWSs) with compliance requirements.

**II. BACKGROUND:**

Pursuant to rules 3745-81-50 through 3745-81-55 of the Ohio Administrative Code all PWSs are required to monitor for total coliform bacteria by collecting samples throughout the distribution system according to a written sample siting plan. This guidance along with the development of a written sample siting plan prepares systems to collect total coliform bacteria samples according to proper sample collection methods, take repeat samples when necessary, and makes them aware of the associated public notice requirements.

**III. GUIDANCE:**

The attached guidance is intended to be provided to systems during sanitary surveys or at any other time when it is discovered that a sample siting plan has not been drafted and/or a system is having difficulties complying with total coliform monitoring requirements.

**V. HISTORY:**

The Division of Drinking and Ground Waters issued the initial Sample Siting Plan Guidance on June 1, 1998. The guidance was revised on July 13, 1999 to incorporate rule changes and different criteria for acute violation public noticing and on August 17, 1999 to incorporate comments received from DDAGW staff.

The guidance was revised again on February 7, 2005 to incorporate new public notice requirements and expanded to include all total coliform monitoring requirements. Minor revisions were made following comments from U.S. EPA on October 14, 2005. The guidance was updated to reflect amended total coliform rules and reissued on June 16, 2011. This latest version has been completed to incorporate the changes in total coliform bacteria monitoring covered by the Revised Total Coliform Rule (RTCR) as adopted by the U.S. EPA effective April 1, 2016.

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(Population Less Than 3,301 Persons)**

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**Purpose**

This document provides information in simple terms on total coliform bacteria monitoring requirements contained in Ohio Administrative Code rules 3745-81-50 through 3745-81-55. It does not replace the rules but is intended to provide guidance for small PWSs.

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## SECTION 1: FREQUENTLY USED TERMS

**Clean compliance history** - A portion of the compliance criteria that noncommunity ground water (GW) systems serving fewer than 1001 persons must meet to return to quarterly monitoring after triggering into monthly monitoring - see Ohio Administrative Code (OAC) Rule 3745-81-01(C)(3).

**Detailed Monitoring Evaluation (DME)** - An evaluation of various system factors such as water quality, compliance history, and contamination barriers to determine if the PWS is on an appropriate routine total coliform monitoring schedule. The evaluation also determines if the total coliform sample siting plan is adequate.

**E. coli MCL violation** - A PWS is in violation of the E. coli MCL when any of the following conditions occur:

- a) A routine total coliform positive sample followed by an E. coli positive repeat sample; or
- b) A routine E. coli positive sample followed by a total coliform positive repeat sample; or
- c) Failure to take all required repeat samples following an E. coli positive routine sample; or
- d) Failure to test for E. coli in any total coliform positive repeat sample.

**NOTE:** If no repeat samples are taken following a total coliform positive routine sample – A Level 1 or Level 2 Assessment will be scheduled based on past compliance.

**Facility ID #** - A unique identification number assigned to various portions of the water system to aid in determining where a water sample was collected: Treatment Plants are a 7-digit number; Distribution Systems are DS1, Wells are WL (followed by multiple numbers). These numbers are typically found on the PWS's monitoring schedule or are available through the district offices.

**Ground Water Rule (GWR)** - A rule that applies to water systems using only ground water sources (wells) for drinking water. The rule outlines the actions required by these PWSs in responding to microbial contamination or identified deficiencies with the system.

**Level 1 Assessment or Level 2 Assessment** - Level 1 and Level 2 Assessments are evaluations to identify the possible presence of significant deficiencies, deficiencies in distribution system coliform monitoring practices, and (when possible) the likely reason that the PWS triggered the assessment. Level 1 Assessments are typically performed by the staff of a PWS with Ohio EPA assistance, while Level 2 Assessments are more comprehensive and usually performed by Ohio EPA staff.

**Minimal Treatment** - Means a ground water system with only one well and either no treatment, treatment consisting of only cartridge filtration or cation exchange, or a combination of only cartridge filtration and cation exchange.

**Monitoring schedule** - A schedule provided to each PWS annually which details sampling requirements for chemical and bacteriological contaminants.

**Monitoring violation** - A monitoring violation occurs when a system fails to:

- a) Collect all required routine samples;
- b) Collect all three (3) temporary routine samples the month following a total coliform positive (quarterly monitoring systems only);

- c) Collect routine samples at appropriate site as stated in sample siting plan;
- c) Test for E. coli in any total coliform positive routine sample;
- d) Follow laboratory sampling, collection, or analysis protocol;
- e) Utilize an approved laboratory for sample analysis.

**Noncommunity ground water systems (NCGWS) serving fewer than 1,001 persons** - A group of small PWSs that is eligible for a routine monitoring schedule of one sample each calendar quarter.

**Primary operating season** - The time during the year when a seasonal system is fully-pressurized and serving water to the public.

**Repeat samples** - Three (3) total coliform samples collected from the distribution system within 24 hours of being notified of the routine total coliform positive result; intended to verify or rebut the routine total coliform positive result. Reference: OAC Rule 3745-81-52(A).

**RP** - SDWIS/State abbreviation for a 'Repeat' sample.

**RT** - SDWIS/State abbreviation for a 'Routine' sample.

**RTCR** - Revised Total Coliform Rule, refers to monitoring and compliance under the U.S. EPA's Revised Total Coliform Rule (effective 04/01/2016).

**Sample Monitoring Point (SMP)** - A unique identification number assigned to a sample tap location at the water system to aid in determining compliance with applicable monitoring of the water system.

Examples of SMPs are:

- EP001 for the entry point sample location
- DS000 for a distribution system sample
- RS001 for a raw water well sample
- GWR001 for triggered source water samples
- SUP01 for Seasonal Start-Up Special Purpose Samples.

**Sample Siting Plan** - A written plan that identifies a sample collection schedule and sampling sites that are representative of water throughout the distribution system.

**SDWIS/State** - The Safe Drinking Water Information System is a database designed for drinking water compliance and enforcement data management.

**Seasonal system** - A noncommunity water system that has distinct seasonal fluctuations in its operations and population served during the course of a year such that all or most of the system is not operated on a year-round basis.

**Significant deficiency** - A defect in design, operation, maintenance, administration, or a failure or malfunction in a system component, including sources, treatment, storage, or distribution system that does any of the following:

1. May provide a pathway of entry for microbial or other contamination into the distribution system or that is indicative of a failure in a barrier that is already in place.
2. Causes, or has the potential to cause, an unacceptable risk to health or that could affect the reliable delivery of safe drinking water, as determined by the Director.

**Small system** - A PWS that serves a population of less than 3,301 people.

**Start-up sample** - A total coliform sample collected from the sample tap(s) in the distribution system considered to be the most susceptible to total coliform contamination. The sample must be collected prior to the seasonal system opening to the public for the season.

**SP** - SDWIS/State abbreviation for a 'Special Purpose' sample.

**Substantial System** - A ground water PWS that has either more than one well (regardless of treatment) or treatment beyond a cation exchange unit and cartridge filter, such as disinfection and/or iron filtration.

**Temporary Routine sample (TR)** - The term used in SDWIS/State for additional routine samples collected during the month after a routine total coliform positive sample was collected for a PWS on quarterly monitoring. This schedule is considered 'temporary,' and should not be confused with repeat samples. It does not apply to any system that is on a monthly monitoring schedule for total coliform.

**Treatment Technique (TT) trigger** - A set of conditions that require a PWS to conduct a Level 1 or Level 2 Assessment of the water system to identify and correct the cause of the trigger.

**Treatment Technique violation** - For RTCR, a TT violation is the failure to:

1. Complete an adequate Level 1 Assessment or Level 2 Assessment within the required timeframe (30 days) (Vio. Type 2A if L1; Vio. Type 2B if L2);
2. Complete the required corrective actions according to the approved schedule following a Level 1 Assessment or Level 2 Assessment (Vio. Type 2C);
3. Complete the required start-up procedure by a seasonal system before serving water to the public. (Vio. Type 2D)

**Water use advisory and/or boil order** - Warning issued to consumers to boil water or use an alternative water source due to contamination of the public water supply. The appropriate advisory is determined in conjunction with the district office representative.

## **SECTION 2: SAMPLE SITING PLAN**

All PWSs are required by Ohio Administrative Code (OAC) Rule 3745-81-50 to prepare and maintain a written sample siting plan for the collection of total coliform bacteria samples at sites which are representative of water throughout the distribution system. The plan should identify routine, repeat, source water, and start-up sampling locations, as applicable. Total coliform samples shall be collected from the sampling sites identified in the sample siting plan. The sample siting plan should be kept up to date and maintained on-site where it can be easily reached by people responsible for collecting samples.

Sample siting plan templates are available on the Revised Total Coliform Rule webpage at: <http://epa.ohio.gov/ddagw/rtrcr.aspx>. All seasonal systems should use the "Seasonal Total Coliform Sample Siting Plan Template." All other systems should use the "General Total Coliform Sample Siting Plan Template."

## SECTION 3: SEASONAL SYSTEMS

The Revised Total Coliform Rule (RTCR) requires different start-up and routine monitoring requirements depending on the type of seasonal system. Depressurizing some or all of the water lines could provide pathways for contamination and necessitates additional requirements to ensure the safety of the water. The three (3) types of seasonal PWSs include:

1. **Depressurized Seasonal:**

The entire water system is depressurized (all waterlines are drained) for a period of time each year.

2. **Partially-Depressurized Seasonal:**

The water system is partially-depressurized (some waterlines are drained) for a period of time each year.

3. **Fully-Pressurized Year-Round Seasonal:**

The entire system stays fully-pressurized (none of the waterlines are drained), but no one has access to the water for a period of time during the year (must be more than 90 consecutive days).

### Section 3.1 Seasonal Start-Up Procedure

Depressurized and Partially-Depressurized Seasonal Systems are required to complete the “Seasonal Public Water System Start-up Requirements and Checklist” annually before the primary operating season.

The checklist includes the submission of at least one start-up “special purpose” total coliform sample. The sample must be collected before the system opens to the public for the season at a location most susceptible to contamination (e.g. furthest from well). It is required in addition to the system’s routine samples.

- If the sample is total coliform negative, the system can complete and submit the “Seasonal Start-Up Certification Form” and begin serving water to the public. The “Seasonal Start-Up Certification Form” must be received by Ohio EPA on or before the day the system begins serving water to the public.
- If the sample is total coliform positive, the system must repeat the disinfection and flushing procedure and collect at least two start-up “special purpose” samples at least 24 hours apart. The samples must be total coliform negative before the system can complete and submit the “Seasonal Start-Up Certification Form” and begin serving water to the public.
- Start-up special purpose samples should be submitted to the lab as follows using the Microbiological Sample Submission Report (SSR):
  - Facility ID = DS1
  - Sample Monitoring Point = SUP01

**Example: A depressurized seasonal system is open from May 15 to September 15.** Requirements include:

1. Completing the “Seasonal Public Water System Start-Up Requirements and Checklist,”
2. Collecting at least one “Special Purpose” total coliform sample before opening.
3. If that sample result is absent, they can submit the “Seasonal Start-Up Certification Form” to the appropriate district office on or before the opening date of May 15<sup>th</sup>.
4. After May 15<sup>th</sup> they would begin collecting routine samples according to the current monitoring schedule.

- Sample Type = Special
- Comments = “Start-Up”

The start-up checklist and “Seasonal Start-Up Certification Form” must be completed every year. Systems must keep a copy of the checklist on file for at least five years for Ohio EPA review.

The “Seasonal Start-Up Certification Form” is required to be submitted to Ohio EPA **on or before the day when water is first available to the public each year** (i.e., on or before the first day of the primary operating season).

Fully-Pressurized Year-Round Seasonal Systems are required to complete the “Simplified Start-Up Checklist for Fully-Pressurized Seasonal Systems” following a Detailed Monitoring Evaluation by Ohio EPA during a site visit. These systems are required to keep a copy of the simplified start-up checklist on file for at least five years for Ohio EPA review. They are not required to submit the “Seasonal Start-Up Certification Form.”

Visit <http://epa.ohio.gov/ddagw/rtrcr.aspx> for copies of the checklists and the certification form.

### ***Section 3.2 Seasonal Routine Monitoring***

Seasonal PWSs shall collect routine total coliform samples according to the monitoring schedule. They must notify the area Ohio EPA district office if the primary operating season has changed (e.g., the season opening, and/or closing date will be earlier or later than the date in Ohio EPA’s database). Changes to the primary operating season may change the routine total coliform monitoring requirements.

Depressurized and partially-depressurized seasonal systems that use ground water and serve fewer than 1,001 people are subject to new monitoring requirements under the RTCR (See Table 1). A new monitoring schedule may be issued to these facilities following a site visit by the Ohio EPA. Routine monitoring requirements are in addition to the “Special Purpose” total coliform seasonal startup sample mentioned above. The first routine sample for a seasonal system must be collected after the first day of the primary operating season on file with Ohio EPA. The primary operating season is displayed on the annual monitoring schedule.

**Table 1: Public Water System Routine Monitoring Frequencies for Total Coliform Bacteria**

Source	Population	Public Water System Type	Minimum Frequency
Surface water	Less than 3,301	All system types	4 samples per month
Purchased surface water	Less than 1,001	All system types	1 sample per month
	1,001 to 2,500	All system types	2 samples per month
	2,501 to 3,300	All system types	3 samples per month
Ground water or purchased ground water	Less than 1,001	Community	1 sample per month
		Depressurized Seasonal and Partially-Depressurized Seasonal	1 sample per month or 1 sample per quarter <sup>1</sup> (during primary operating season; reference monitoring schedule)
			1 sample per quarter (during off-season, if partially-depressurized)
		Fully-Pressurized Year-Round Seasonal	1 sample per quarter (during primary operating season)
	Transient noncommunity and Nontransient noncommunity	1 sample per calendar quarter <sup>2</sup>	
	1,001 to 2,500	All system types	2 samples per month
	2,501 to 3,300	All system types	3 samples per month

<sup>1</sup>Depressurized and partially-depressurized seasonal system will be transitioned to the RTCR routine monitoring schedule following a Detailed Monitoring Evaluation (DME) performed by Ohio EPA. Until that time, these systems will be on quarterly monitoring during the primary operating season. Following the DME, these systems will switch to monthly monitoring during the primary operating season.

<sup>2</sup>System may be triggered into monthly monitoring for a minimum of 12 months if any of the events in OAC Rule 3745-81-51(B)(3) occur. See Section 7.1.

## SECTION 4: ROUTINE MONITORING

### **Section 4.1 Required Frequency**

All PWSs are required by OAC Rule 3745-81-51 to monitor for total coliform bacteria on a routine basis. As shown in Table 1, the number of routine samples required depends on the type of system, the source of water, and the population served. Samples should be collected according to the instructions found in the “Collection of Drinking Water Samples for Total Coliform Bacteria Analysis” document available here: <http://epa.ohio.gov/Portals/28/documents/rules/rtrcr/TCSampleCollection.pdf>.

The frequency of total coliform monitoring may be increased based on the results of a sanitary survey or Detailed Monitoring Evaluation. The increased monitoring frequency may then be reduced following subsequent sanitary surveys but will not be less than the minimum frequency listed in Table 1.

### **Section 4.2 Chlorine Monitoring**

All PWSs that supply water treated with chlorine or chloramines for disinfection purposes must also measure chlorine residual levels (total chlorine) at the time and location that routine and repeat total coliform bacteria samples are collected. Tips on how to do this are provided in the sample siting plan templates available on the Revised Total Coliform Rule webpage at: <http://epa.ohio.gov/ddagw/rtrcr.aspx>

### **Section 4.3 What happens if....**

#### **The routine sample(s) is (are) not collected?**

- The system will receive a monitoring violation and may receive a \$150 penalty.
- If the PWS is on **quarterly** monitoring, it may be increased to monthly monitoring (see “Triggering into Monthly Monitoring” in Section 7.1).
- The system is required to issue a Tier 3 public notice, as instructed in Section 9.

#### **The routine sample result(s) is total coliform negative?**

- Continue taking the next required routine sample.

#### **The routine sample result(s) is total coliform positive?**

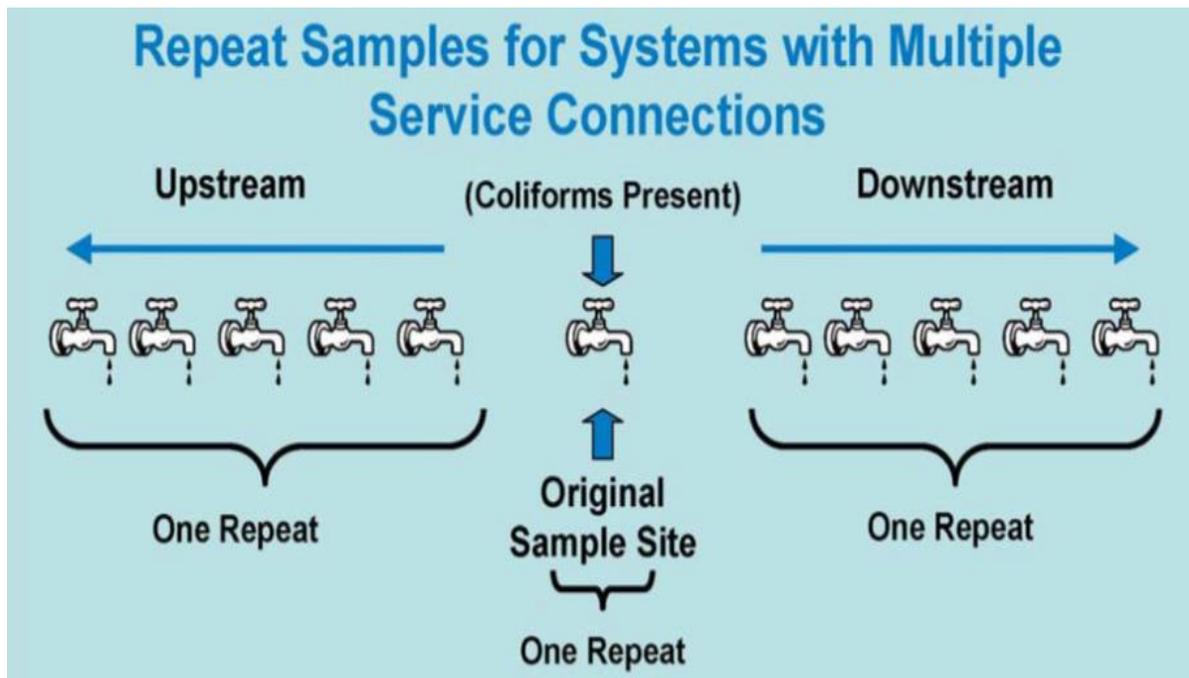
- Collect a set of three (3) repeat samples for each total coliform positive routine sample within 24 hours of notification, as described in Section 5.
- If applicable, collect the required number of source water samples under the Ground Water Rule. See Section 6 to determine if this requirement applies. Contact the area Ohio EPA district office for more information.
- Collect the required number of routine total coliform samples during the following month, as described in Section 7.
- Contact the area district office if there are any questions.

## SECTION 5: REPEAT MONITORING

PWSs are required by OAC Rule 3745-81-52 to collect a set of **three (3) repeat samples for each routine total coliform positive sample**. The PWS must collect the repeat samples within 24 hours following notification of the total coliform positive sample by either the laboratory or Ohio EPA. The repeat samples must be collected at the original total coliform positive routine sampling location and 2 additional sampling locations as described below.

All three (3) repeat samples must be collected on the same day in accordance with the sample siting plan (see Section 2) which identifies which taps are appropriate for total coliform monitoring. If there are fewer than three (3) sample taps (e.g., faucets) identified, the three (3) repeat samples should be collected from the identified taps at a minimum of **5-minute intervals with the water running continuously between samples**. If there are at least three (3) available sample taps, the three (3) repeat samples should be collected as follows:

1. One from the same sample tap as the original total coliform positive routine sample;
2. One from a sample tap within five service connections (or sample taps) upstream of the original sample site (i.e., closer to the source); and
3. One from a sample tap within five service connections (or sample taps) downstream of the original sample site (i.e., further from the source).



The sample siting plan shall be used to identify sample taps (e.g., faucets) for repeat samples. When submitting the samples to the lab, they should be labeled as follows on the Microbiological Sample Submission Report:

- Facility ID = DS1
- Sample Monitoring Point = DS000
- Sample Type = Repeat
- Note: Each sample submitted to the lab is assigned a unique sample number. The original

routine total coliform positive sample number must be included on the Microbiological Sample Submission Report (SSR). There should be a section for this on the SSR. If not, write it in the “Comments” section.

### **Section 5.1 Extensions**

PWSs may receive an extension to the 24-hour deadline for collecting three (3) repeat samples under specific circumstances. If the PWS cannot collect all three (3) repeat samples within 24 hours for one or more of the following reasons, then they may receive an extension of up to an additional 72 hours:

1. The certified laboratory that performs sample collection for the system is not available on a weekend or holiday;
2. The 30-hour hold time before analysis would be exceeded due to limited delivery service or because the laboratory is closed;
3. Sample bottles could not be obtained because the lab is closed on a weekend or holiday;
4. Extreme weather conditions create unsafe travel or on-site conditions for the sample collector.

The reason for the extension must be recorded on the Sample Submission Report given to the laboratory. For example, the PWS should write in the “Comments” box, “Collection deadline extended because certified lab was not available on the weekend.” PWSs should contact the area Ohio EPA district office with any questions regarding extensions.

### **Section 5.2 What happens if...**

#### **All repeat sample results are total coliform negative?**

- Collect the required number of routine total coliform samples the following month as instructed in Section 7.

#### **All repeat samples were not collected on time following a total coliform positive (E. coli negative) routine sample?**

- Contact the area district office representative no later than the end of the next business day after learning of the violations.
- If no extension is justified, the system has exceeded a Treatment Technique trigger and an assessment must be conducted.
  - Ensure the assessment is conducted to determine the source of contamination, as instructed in Section 10. Ohio EPA will notify you which type of assessment is required (Level 1 or Level 2).
  - Either agree or disagree with the assessment letter from the District office.
    - If you agree with the findings – complete the corrective actions, if any, according to the schedule outlined in the assessment form and letter.
    - If you disagree with the findings – respond, in writing, by the deadline provided in the assessment letter.
- Collect the required number of routine samples the following month as instructed in Section 7.

#### **All repeat samples were not collected on time following an E. coli positive routine sample?**

- Contact the area district office representative by the end of the day when the system is notified of an E. coli-positive routine sample, unless the system is notified of the result after the designated district office is closed, in which case the system shall notify the district office representative before the end of the next business day.
- If no extension is justified, an E. coli maximum contaminant level violation is triggered.
  - Issue a Tier 1 public notice, including a water use advisory and/or boil order, until a set of three (3) repeats are all total coliform negative. Collect the repeat samples as

- o instructed in Section 5.
  - o Ensure a Level 2 Assessment is conducted to determine the source of contamination.
    - Either agree or disagree with the Level 2 Assessment letter from the district office.
      - If you agree with the findings – complete the corrective actions, if any, according to the schedule outlined in the assessment form and letter.
      - If you disagree with the findings – respond, in writing, by the deadline provided in the assessment letter.
- Collect the required number of routine samples the following month as instructed in Section 7. Systems on **quarterly** monitoring are required to begin monthly monitoring next month (see “Triggering into Monthly Monitoring” in Section 7.1).

**The routine sample was total coliform positive (E. coli negative) and one or more repeat samples are total coliform positive (E. coli negative)?**

- Contact the area district office representative no later than the end of the next business day
- The system has exceeded a Treatment Technique trigger and an assessment must be conducted.
  - o Ensure the assessment is conducted to determine the source of contamination, as instructed in Section 10. Ohio EPA will notify you which type of assessment is required (i.e., Level 1 or Level 2).
  - o Either agree or disagree with the assessment letter from the district office.
    - If you agree with the findings – complete the corrective actions, if any, according to the schedule outlined in the assessment form and letter.
    - If you disagree with the findings – respond, in writing, by the deadline provided in the assessment letter.
- Collect the required number of routine samples the following month as instructed in Section 7.

**All routine and repeat samples were collected on time, the routine sample is total coliform positive and one or more of the repeat samples are E. coli positive?**

- Contact the area district office representative by the end of the day when the system learns of an E. coli maximum contaminant level violation, unless the system learns of the violation after the designated district office is closed, in which case the system shall notify the district office representative before the end of the next business day
- The PWS has an E. coli MCL violation.
- Issue Tier 1 public notification, including a water use advisory and/or boil order, until a set of three (3) repeats are all total coliform negative. Collect the repeat samples as instructed in Section 5.
- Ensure a Level 2 Assessment is conducted to determine the source of contamination.
  - o Either agree or disagree with the Level 2 Assessment letter from the district office.
    - If you agree with the findings – complete the corrective actions, if any, according to the schedule outlined in the assessment form and letter.
    - If you disagree with the findings – respond, in writing, by the deadline provided in the assessment letter.
- Collect the required number of routine samples the following month as instructed in Section 7. Systems on **quarterly** monitoring are required to begin monthly monitoring next following (see “Triggering into Monthly Monitoring” in Section 7.1).

## SECTION 6: TRIGGERED SOURCE WATER MONITORING (TSWM)

Ground water systems, as defined in OAC Rule 3745-81-01, are required to conduct triggered source water monitoring (TSWM) as determined by Ohio EPA. Substantial PWSs required to conduct TSWM must collect at least one total coliform source water sample (i.e., before any treatment) within 24 hours of being notified of a total coliform positive routine sample. A source water sample must be collected from each ground water source in use when the total coliform positive routine sample was collected or as described in the approved triggered source water monitoring plan at one or more sampling locations. TSWM is required if the following conditions exist:

1. The system does not provide at least 4-log treatment of viruses as approved by the director; and
2. The system is notified that a routine total coliform sample is positive that has not been invalidated.

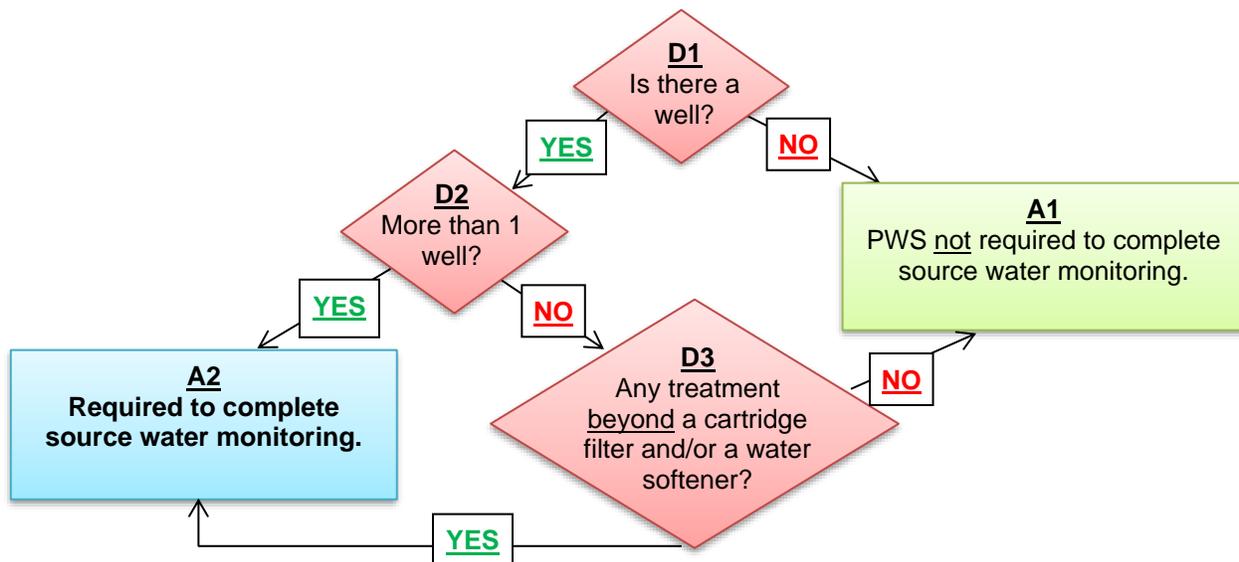
This requirement only applies to ground water systems that are considered GWR Substantial Systems. GWR Substantial Systems are defined as PWSs that meet one or more of the following criteria:

1. Have more than one well.
2. Have additional treatment beyond a water softener and/or cartridge filter.

If neither of the above criteria are met, then the PWS is considered a GWR Minimal Treatment System, and one of the repeat samples counts as a raw water sample and doubles as the required triggered source water sample. See Figure 1 for assistance with determining if the water system is required to take a separate source water monitoring (Triggered) sample.

The designation of “Ground Water Rule Minimal Treatment System” or “Ground Water Rule Substantial System” is listed near the top of each PWS’s distribution monitoring schedule. For more information on whether this requirement may apply to the PWS, please see OAC Rule 3745-81-42(A) or contact the area Ohio EPA district office.

**Figure 1. How to Determine if a raw water Triggered Source Water Monitoring sample taken before treatment is Required.**

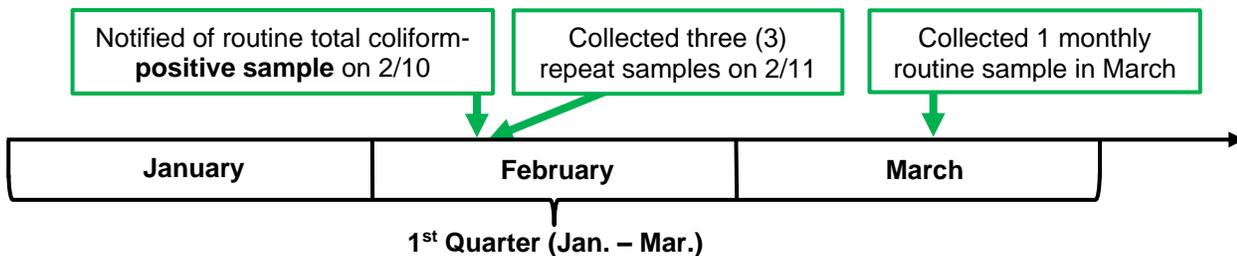


## SECTION 7: SAMPLING THE MONTH FOLLOWING A TOTAL COLIFORM POSITIVE ROUTINE SAMPLE

### ROUTINE MONTHLY MONITORING:

If you monitor monthly, **do not** take extra samples the month following a total coliform positive routine sample (see Figure 2). Collect the normal number of monthly routine samples (check the monitoring schedule). Additional increased monitoring is not required, unless directed by Ohio EPA.

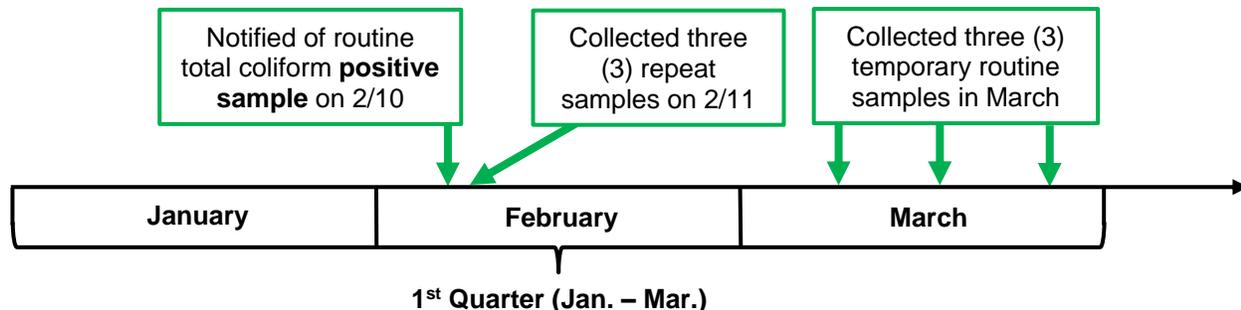
**Figure 2. Sampling Requirements for an Example PWS on /Monthly Monitoring**



### ROUTINE QUARTERLY MONITORING:

If you monitor quarterly, collect **at least three (3) temporary routine samples** during the month following a total coliform positive routine sample, unless you trigger into monthly monitoring (see Section 7.1 below). Repeat samples do not count towards the requirement to collect three (3) temporary routine samples (See Figure 3 below). Samples should be collected at locations identified in the Sample Siting Plan (Section 2). It is recommended that the three (3) samples be collected on different days of the month.

**Figure 3. Sampling Requirements for an Example PWS on Quarterly Monitoring**



### Section 7.1 Triggering into Monthly Monitoring

PWSs that monitor **quarterly** can trigger into **monthly** monitoring if any of the following occur:

- The system triggers two (2) Level 1 Assessments within a consecutive 12-month period;
- The system triggers a Level 2 Assessment;
- The system has an RTCR treatment technique violation;
- The system has two (2) RTCR monitoring violations within a consecutive 12-month period;
- The system has one (1) RTCR monitoring violation and triggers one (1) Level 1 Assessment within a consecutive 12-month period.

If the PWS triggers into monthly monitoring, they are not required to collect the three (3) temporary routine samples the following month. Instead, the PWS will begin collecting monthly routine samples for at least 12 consecutive months and may be eligible for a reduction to quarterly monitoring if the criteria in OAC Rule 3745-81-51(B)(4) are met.

## **Section 7.2 What happens if...**

### **All temporary routine sample results are total coliform negative?**

- Return to routine quarterly monitoring.

### **One or more of the three (3) temporary routine samples is not collected?**

- The PWS has a monitoring violation and may receive a \$150 penalty.
- Issue Tier 3 public notification, as instructed in Section 8.
- Resume routine monitoring. If the PWS is on **quarterly** monitoring, it may have triggered into monthly monitoring (see Section 7.1 above).

### **One or more of the three (3) temporary routine samples is total coliform positive?**

- Collect three (3) repeat samples for each total coliform positive sample, as described in Section 5.
- Contact the area district office inspector for assistance with any questions.
- Ohio EPA will notify you if you have triggered an assessment. If so, you are required to ensure an assessment is conducted to determine the source of contamination.
  - Either agree or disagree with the assessment letter from the district office.
    - If you agree with the findings – complete the corrective actions, if any, according to the schedule outlined in the assessment form and letter.
    - If you disagree with the findings – respond, in writing, by the deadline provided in the assessment letter.
- Collect the required number of routine samples the following month:
  - Systems on **quarterly** monitoring will collect three (3) temporary routine samples, unless they trigger into monthly monitoring (see Section 7.1 above).
  - Systems on **monthly** monitoring will collect one routine sample.

## **SECTION 8: LABORATORY INVALIDATION OF SAMPLE RESULTS**

If a **routine or repeat** sample is analyzed by a membrane filtration technique and exhibits confluent growth (CG) or produces colonies too numerous to count (TNTC), the sample must be invalidated unless further analysis indicates that total coliforms are detected. A sample will also be invalidated if the total coliform analysis does not conform to the “Ohio EPA Laboratory Manual for the Microbiological Analyses of Public Drinking Water 2014,” OAC Chapter 3745-89, and OAC Rule 3745-81-27. A replacement sample must be collected within 24 hours from the time the PWS is notified of the invalid sample, as required by OAC Rule 3745-81-50(D).

## SECTION 9: PUBLIC NOTIFICATION INSTRUCTIONS

Public water systems are required by OAC Rule 3745-81-32 to notify the public if they exceed the E. coli MCL or fail to monitor for total coliform. If a Tier 1 public notice is required, the PWS must contact the Ohio EPA district office and issue notification no later than 24 hours after being notified of the violation. If a Tier 2 or Tier 3 public notice is required, Ohio EPA will send a letter that contains the appropriate public notice, instructions on how to issue the notice, and a verification form. Send a copy of the public notice issued and the completed verification form to the area Ohio EPA district office representative.

### Tier 1 Public Notice: E. coli MCL Violations

- Issue public notice (including a water use advisory and/or boil order) and consult with the area district office for additional instructions as soon as possible, but no later than 24 hours after being notified of the violation. Consultation with the district office is recommended prior to issuing public notice, but in no case should the public notice be issued later than 24 hours after being notified of the violation.
- Use one or more of the following methods to reach all persons served, as established during consultation:
  - ❖ Radio and television (appropriate for community systems)
  - ❖ Continuous posting (appropriate for noncommunity systems)
  - ❖ Hand delivery
  - ❖ Another method with the approval from the area Ohio EPA district office
- The public notice cannot be lifted until a set of three (3) repeat samples collected on the same day are total coliform negative.

### Tier 2 Public Notice: Treatment Technique Violations

- Issue as soon as practical, but no later than 30 days after notification of the violation.
- Community PWSs use mail or other direct delivery.
- Noncommunity PWSs use continuous posting, mail or other direct delivery.
- If posted, notices must remain in place as long as the violation or situation exists, but in all cases **for at least 7 days**, even if the violation has been resolved.

### Tier 3 Public Notice: Monitoring and Reporting Violations

- Community PWSs:
  - Issue as soon as practical, but no later than 1 year after notification of the violation.
  - Use mail or other direct delivery.
- Noncommunity PWSs:
  - Issue as soon as practical, but no later than 30 days after notification of the violation.
  - Use continuous posting, mail or other direct delivery.
- If posted, notices must remain in place as long as the violation or situation exists, but in all cases, **for at least 7 days**, even if the violation has been resolved.

## SECTION 10: IDENTIFICATION AND ELIMINATION OF CONTAMINATION

### Conducting a Level 1 Assessment (L1A)

PWSs are required by OAC Rule 3745-81-53 to ensure that an assessment is conducted to evaluate and identify the possible presence of significant deficiencies, deficiencies in distribution system coliform monitoring practices, and (when possible) the likely reason that the PWS triggered the assessment. Repeat and special purpose samples from different sampling taps are helpful to identify the source of contamination. Special purpose samples may be used to investigate the source of contamination or to verify the problem has been resolved. Special purpose samples are, however, not used to determine compliance with total coliform monitoring or MCL requirements.

A Level 1 Assessment is triggered following a routine total coliform positive sample where:

1. At least one (1) repeat sample is total coliform positive, or
2. All repeat samples were not collected and submitted within the proper timeframe.

An Ohio EPA district office representative will contact the system to conduct a Level 1 Assessment to determine the possible cause or causes of the total coliform positive results. The causes may include any or all of the following issues: source water, treatment process, sample collection procedure, or some other event or practice in the distribution system that permitted bacteria to enter the water system.

Systems should consult with the area Ohio EPA district office representative on any measures taken to identify and eliminate the source of contamination. In addition, any corrective actions or measures taken by the drinking water system prior to or after repeat testing should be noted. Information on disinfecting a well can be found in the "Disinfection of a Public Water System Well" document on the Revised Total Coliform Rule webpage at: <http://epa.ohio.gov/ddagw/rtrcr.aspx>

In the event a Level 2 Assessment is triggered, the water system will be contacted by the area Ohio EPA district representative to schedule an on-site visit to conduct the investigation.

## Tips for Investigating Total Coliform Bacteria Contamination

1. Check sample tap for cleanliness and confirm correct sample collection procedure was followed.
2. Check the well for possible sources of contamination by:
  - Ensuring that water drains away from the well casing.
  - Determining if any fluid is seeping into the well. This may indicate a crack in the casing. This can be determined by looking inside the well with a flashlight, a down-hole camera, or by using a mirror on sunny days. You may hear fluid seeping into the well.
  - Making sure the well cap is securely closed and vermin-proof.
  - Checking the pit-less adaptor to ensure it is connected properly and securely.
3. Check the area surrounding the well to determine if septic systems, surface bodies of water, or other sources of contamination have encroached on the well's isolation radius.
4. Make sure there are no leaks in the waterline between the well and the treatment system.
5. Check for holes in the pressure tank bladder.
6. Make sure the treatment equipment is properly maintained, and if work has recently been done on the system; ensure that proper disinfection followed to minimize the introduction of bacteria into the system.
7. Ensure that backflow prevention devices are tested and maintained.
8. Look for areas where fluid could be siphoned back into the system (e.g., hoses connected to the pressure tank and dropped into a sump).
9. Collect investigatory special purpose water samples from appropriate locations to isolate where contamination may be entering the system (e.g., directly from the well, from the tank, after the softener, after a treatment unit).
10. If no possible sources of contamination are revealed, consider hiring a well driller to inspect the well with a down-hole camera and/or a plumber to inspect the distribution system to identify any deficiencies.

## SECTION 11: CONTACT INFORMATION



For additional information, contact the area district office representative or visit [www.epa.ohio.gov/ddagw/rtrc.aspx](http://www.epa.ohio.gov/ddagw/rtrc.aspx).

### Northwest District Office

347 North Dunbridge Road  
Bowling Green, Ohio 43402  
(419) 352-8461  
Fax: (419) 352-8468

### Northeast District Office

2110 E. Aurora Road  
Twinsburg, Ohio 44087  
(330) 963-1200  
Fax: (330) 487-4760

### Southwest District Office

401 East Fifth Street  
Dayton, Ohio 45402  
(937) 285-6357  
Fax: (937) 285-6249

### Central District Office

50 West Town Street, Suite 700  
Columbus, Ohio 43216  
(614) 728-3778  
Fax: (614) 728-3898

### Southeast District Office

2195 Front Street  
Logan, Ohio 43138  
(740) 385-8501  
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