Part A

The Requirements of the RTCR

An Overview

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A. The Requirements of the RTCR, an Overview

A.1. Is this guide for me?

THE REVISED TOTAL COLIFORM RULE (RTCR) REQUIREMENTS PRESENTED IN THIS DOCUMENT

The requirements presented here are the federal requirements of the RTCR. Drinking water primacy agencies may have additional requirements specific to their programs. Systems should check with their primacy agency to make sure they are complying with all their RTCR requirements.

The guide is designed for use by public water systems serving 1,000 or fewer persons to help them comply with the requirements of the Revised Total Coliform Rule (RTCR).

Primacy agencies and technical assistance providers may also benefit from reading this guide.

This part of the guide summarizes the key requirements of the RTCR. For a more comprehensive discussion of the rule, water systems can review **Part B** of this guide.

Systems should check with their drinking water primacy agency to determine if there are other requirements specified by the primacy agency with which they need to comply.

What Is a System Type?

It is important for water systems to determine their system type, as requirements vary depending on whether they are a community water system or non-community water system, a system that uses ground water or surface water, and whether or not they are a seasonal system. Systems should check with their drinking water primacy agency if they are not sure about their proper classification.

A.2. What is the RTCR?

The RTCR is one of the national primary drinking water regulations that protect the safety of drinking water in the U.S. It protects public health by limiting the levels of certain microbial organisms in drinking water. The RTCR is a revision of the 1989 Total Coliform Rule, which systems must comply with until March 31, 2016 (unless the drinking water agency starts to implement the RTCR earlier). **Starting no later than April 1, 2016, all systems must comply with the requirements of the RTCR**.

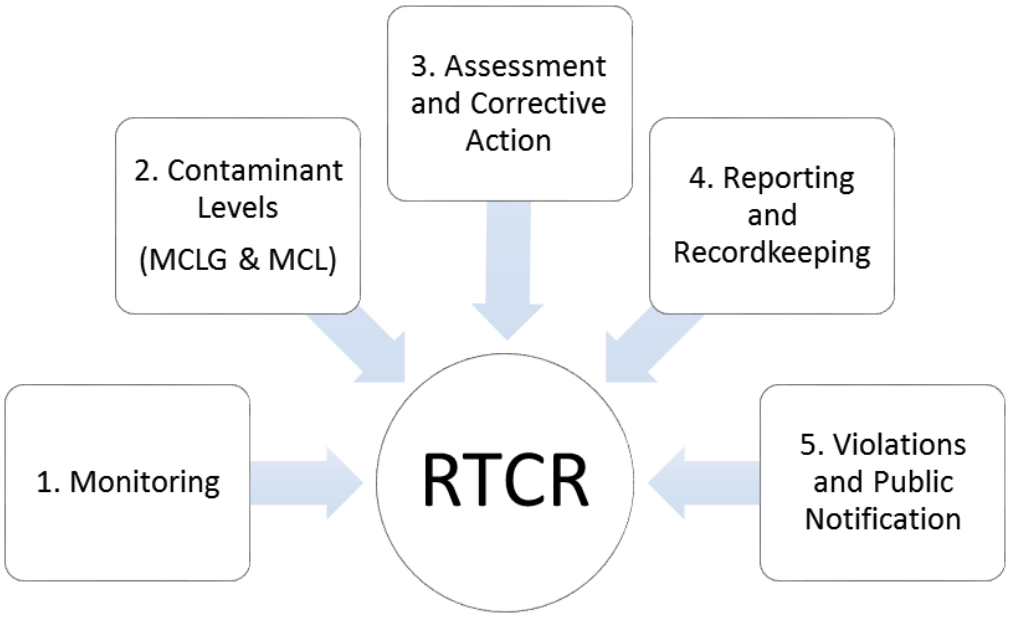
The RTCR requires systems to monitor for the presence of **total coliforms** and ***E. coli*** in drinking water. Total coliforms are a group of closely related bacteria that are natural and common inhabitants of soil and surface waters. Their presence in drinking water suggests that there has been a breach or failure in the water system (for example, a hole in the pipe); and pathogens, which are disease-carrying organisms, may have entered the drinking water. *E. coli*, on the other hand, is a type of bacteria that is a subset of total coliforms, most often fecal in origin (that is, from human or animal wastes). The presence of *E. coli,* therefore, can indicate that the water has been contaminated with fecal waste, which can contain pathogenic organisms.

The RTCR sets a maximum contaminant level (MCL) for *E. coli*. The MCL is the level with which systems must comply. In addition, certain levels of total coliforms in the water can trigger the system to perform an assessment of their infrastructure and sampling practices, as explained later in this guide.

A.3. What does the RTCR require of water systems?

The requirements of the RTCR can be grouped into the following five categories. All water systems must comply with these requirements. These requirements are discussed in greater detail throughout this section.

Figure A-1. The RTCR Requirements



A.3.1. Monitoring

Public water systems must regularly monitor for the presence of total coliforms and *E. coli* in their water based on a **sample siting plan**. The water system must develop a sample siting plan that identifies when and where the samples will be taken. Samples must be taken in a location that is representative of the water quality in the distribution system (each water sample must be at least 100 ml in volume). The sample siting plan is subject to drinking water primacy agency review and revision.

What Steps Do I Need to Take?

1) Develop a sample siting plan that has your schedule and location of water samples.

2) Take a sample of your water on a regular basis and have it tested for the presence of total coliforms. This is your routine sample.

3) If your routine sample is total coliform-positive: (a) have it tested for *E. coli* and (b) take repeat samples within 24 hours of being notified of the positive result.

4) Have your repeat samples analyzed for total coliforms and, if positive, for *E. coli*.

See Figure A-3 for an illustration of the steps.

Compliance Samples

1) Routine samples– These are water samples that water systems are required to take on a regular basis – whether that frequency is annually, quarterly, or monthly – to monitor for the presence of total coliforms. A water sample that is positive for total coliforms must be further tested for the presence of *E. coli.* State-certified laboratories generally test positive total coliform samples for *E. coli* automatically, but water systems should check to be sure this is completed. A positive sample may also require additional sampling the next month, as described below.

If necessary, systems should check with their drinking water agency to determine the minimum number and frequency of total coliform samples they need to take (that is, one every month, one every three months, one every year, etc.). Systems can also check with

their drinking water primacy agency to determine if their existing sample siting plan needs to be revised.

Systems on a quarterly or annual monitoring schedule may be required to take routine samples more frequently.

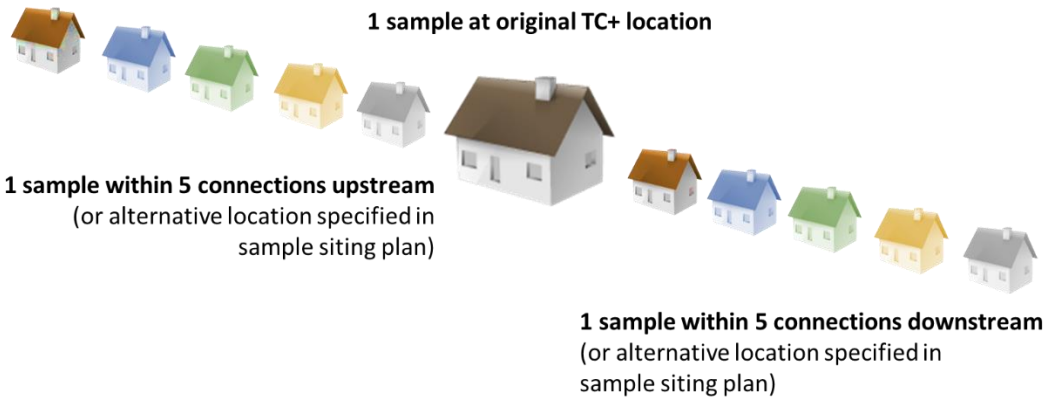
- The system must collect three **routine samples the month following a total coliform-positive sample**. It must continue to do so until all the samples are total coliform-negative or it has been informed by its primacy agency that it needs to take samples on a monthly basis rather than on a quarterly or annual basis.
- The RTCR specifies certain conditions that will require a system to take samples more frequently. For example, a system on annual or quarterly monitoring with test results repeatedly showing the presence of total coliforms or *E. coli* in its water may be required to take samples on a monthly basis. These conditions are found in **Part C** of this guide, under Items J to M of the Compliance Checklist.

2) Repeat samples– These are follow-up samples that water systems are required to take each time a routine sample is positive for total coliforms. Repeat samples, like routine samples, must be tested for the presence of total coliforms, and if positive, for the presence of *E. coli.* State-certified laboratories generally do this automatically but water systems should check to be sure it is completed. Water systems must collect **three repeat samples** (each water sample must be at least 100 ml in volume) within **24 hours** after being notified of the total coliform-positive sample result. **Figure A-2** shows where the repeat samples must be taken. For systems with only a single service connection, the drinking water primacy agency may allow the system to take the repeat samples over a period of three consecutive days (one sample for each day) or collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 ml.

Special Purpose Samples

Special samples are collected during repairs, responses to complaints, or for other maintenance reasons. Collection of these types of samples is often necessary to ensure that coliforms have not entered the distribution system as a result of events such as installation of new mains, main break repairs, or routine maintenance. **Special samples are not included in compliance or assessment trigger calculations**.

Figure A-2. Location of Repeat Samples



Sending Samples to the Laboratory

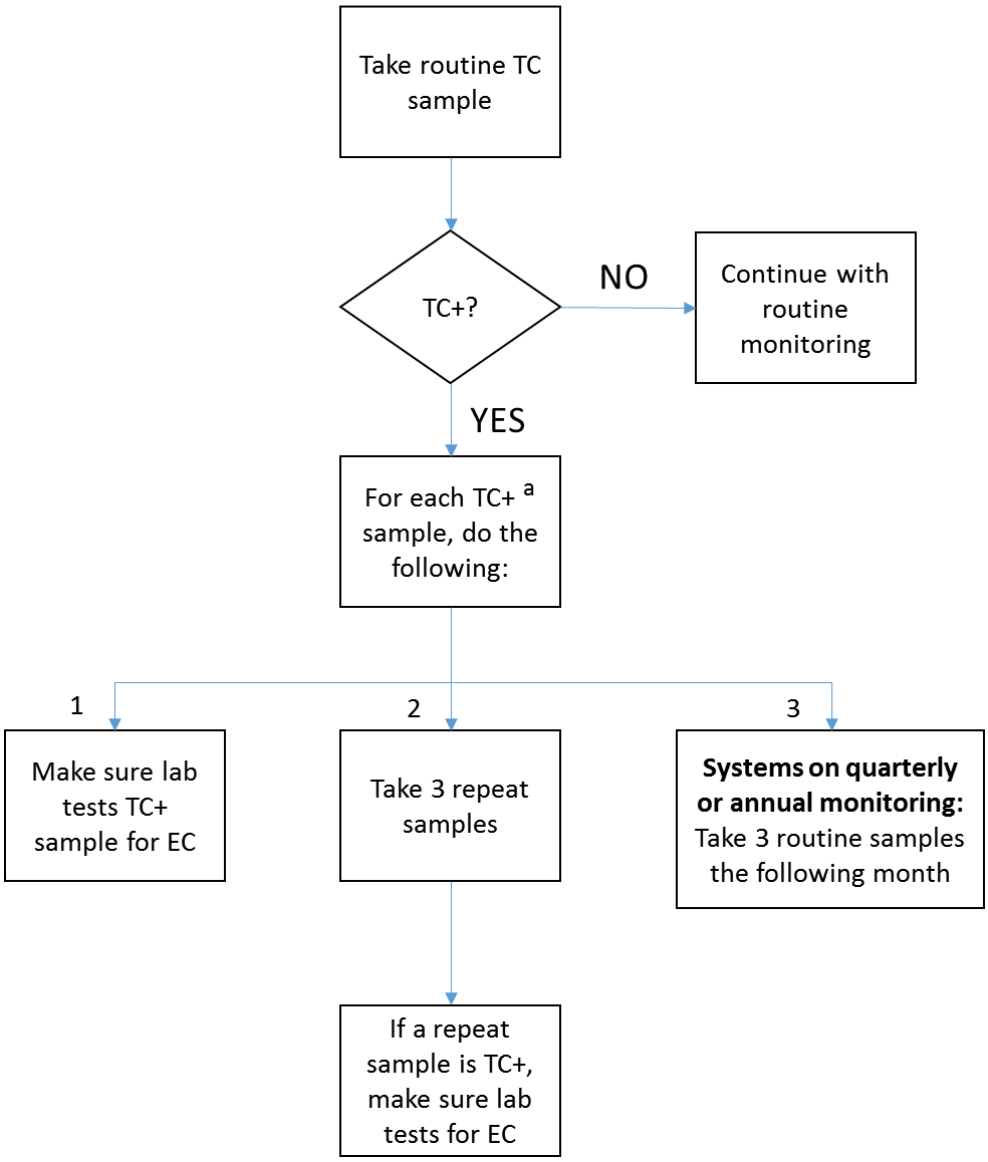
Systems must send their samples to a laboratory certified by the primacy agency for testing. Send the sample(s) as soon as possible, keeping in mind that the laboratory must start the tests within 30 hours of sample collection. EPA encourages (but does not require) that samples be shipped below 10°C (50°F). This temperature may be achieved by carefully packing the water samples in ice. Care should be taken when packing samples to avoid freezing. The laboratory may invalidate frozen samples.

In general, systems follow the sequence outlined in **Figure A-3** when complying with the monitoring requirements of the RTCR.

Compliance Tips

- Have your sample siting plan in an accessible place. Keep it up to date.
- Have sampling kits available and ready to use when you need to sample your water.
- Contact your drinking water agency if you have any questions about RTCR requirements.

Figure A-3. Diagram Showing the RTCR Monitoring Requirements



TC – total coliforms; **TC+** - total coliform-positive
EC – *E. coli*; **EC+** - *E. coli*-positive

[a] If you operate a ground water system not providing 4-log treatment of viruses, collect source water samples to comply with the Ground Water Rule.

Additional Requirements for Seasonal Systems

A **seasonal water system** is a non-community water system that starts up and shuts down operations at the beginning and end of each operating period. Examples are parks, campgrounds, fairgrounds and ski resorts.

I operate a seasonal system. What other requirements do I need to comply with?

1) Completion of **primacy agency-approved start-up procedures** before serving water to the public.

2) **Certification** to the primacy agency of completion of start-up procedures.

3) Designation in sample siting plan of **vulnerable time period to take sample**, if monitoring quarterly or annually.

Typical examples of seasonal systems

campgrounds

ski resorts

fairgrounds

Start-up Procedures

Seasonal systems are required to complete start-up procedures at the beginning of each operating season before serving water to the public. Some examples of start-up procedures that a drinking water primacy agency may require of seasonal systems include the following:

Flushing all pipes

Cleaning all water storage tanks

Disinfecting

Inspecting and repairing components

Collecting samples

Certification of Completion of Start-up Procedures

Seasonal systems are required to certify to the drinking water primacy agency that they have completed the start-up procedures. Each primacy agency will have different methods of certification. Systems should check with their drinking water primacy agency to determine how they will complete the certification process.

Sampling During the Vulnerable Time Period

Seasonal systems on a quarterly or annual monitoring period must state in their sample siting plan the time period when they will take their routine sample. This period is based on site-specific conditions. Consider, for example, when the demand for water is the highest, when the source water is most vulnerable to contamination (for example, during the wet season), or when there is a source of contamination that might affect the area surrounding the well (for example, spreading of animal waste for fertilizer). The system must have the sample siting plan approved by the drinking water primacy agency and the system must monitor during the period identified in the sample siting plan.

Tips for Seasonal Systems

- Check with your drinking water primacy agency to determine what start-up procedures you need to complete ahead of your opening for the season.
- Submit your certification of completion of start-up procedures as required by your drinking water primacy agency.
- Contact your drinking water primacy agency if you have any questions about RTCR requirements.

A.3.2. Contaminant Levels (MCLG and MCL)

Maximum contaminant level goal (MCLG)

Level of contaminant in drinking water below which there is no known or expected risk to health. It is a goal that allows for a margin of safety.

Maximum contaminant level (MCL)

Highest level of contaminant that is allowed in drinking water. It is set as close to the MCLG as feasible using the best available technology and taking cost into consideration. The MCL is the level the systems must comply with.

MCLG for *E. coli*

The MCLG for *E. coli* is set at **zero**.

MCL for *E. coli*

The MCL for *E. coli* is based on the results of the routine sample and its associated repeat samples. The system is out of compliance with the MCL if:

- The system has an ***E. coli*-positive repeat** sample following a **total coliform-positive routine** sample.
- The system has a **total coliform-positive repeat** sample following an ***E. coli*-positive routine** sample.
- The system fails to take all required repeat samples following an *E. coli*-positive routine sample.
- *E. coli* analysis is not completed when any repeat sample tests positive for total coliforms.

Compliance Tips

- Always take three repeat samples within 24 hours of being notified that your routine sample is total coliform-positive.
- Make sure that your laboratory is testing for *E. coli* when a sample is total coliform-positive.
- Contact your drinking water primacy agency if you have any questions about the requirements.

A.3.3. Assessment and Corrective Action

The RTCR requires an assessment or an investigation of the water system when certain conditions occur. There are two levels of assessments. A Level 1 assessment is a basic examination of the system. The Level 2 assessment is a more comprehensive and more in-depth examination of the system compared to a Level 1 assessment. Any problem (referred to as sanitary defects) found during the assessment must be corrected. The assessment and corrective action(s) must be completed within a required timeframe.

How do I comply with the assessment and corrective action requirements of the RTCR?

1) Determine if you have triggered either a Level 1 or Level 2 assessment.

2) Determine who can conduct the assessment and what assessment form to use.

3) Make sure that the assessment is conducted as soon as practical.

4) Correct any sanitary defects identified during the assessment.

5) Complete the assessment form and submit it to the drinking water primacy agency within 30 days of learning of the trigger.

Sanitary Defects

A sanitary defect (1) could provide a path for microbial contaminants to enter the distribution system or (2) indicates an existing failure or failure that could happen soon in a protective barrier (for example, treatment, practice, or structure) that is already in place. Examples include the following three scenarios:

Cracks on a storage tank

Rat droppings around the wellhead

Seal on wellhead not watertight

Photos courtesy of Nevada Division of Environmental Protection

Level 1 Assessment Triggers

A Level 1 assessment is required (triggered) when either of the following conditions occurs:

- Two or more total coliform-positive samples in the same sampling period (include the results of all routine and repeat samples)
- Not all required repeat samples are collected after a routine total coliform-positive sample

Level 2 Assessment Triggers

A Level 2 assessment is required (triggered) when any of the following conditions occurs:

- An *E. coli* MCL violation
- A second Level 1 assessment is triggered within a rolling 12-month period
- For systems on an annual monitoring frequency, a Level 1 assessment is triggered in two consecutive years

Persons Allowed to Conduct a Level 1 Assessment

A responsible party of the public water system can conduct a Level 1 assessment. The water system should consult with their drinking water primacy agency to determine who in their water system can conduct the assessment.

Persons Allowed to Conduct a Level 2 Assessment

The Level 2 assessment must be conducted by someone approved by the drinking water primacy agency, which could be primacy agency staff or a third party (such as an outside contractor). In some circumstances, it could be conducted by one of the system's staff or management with the required qualification(s) specified by the drinking water primacy agency.

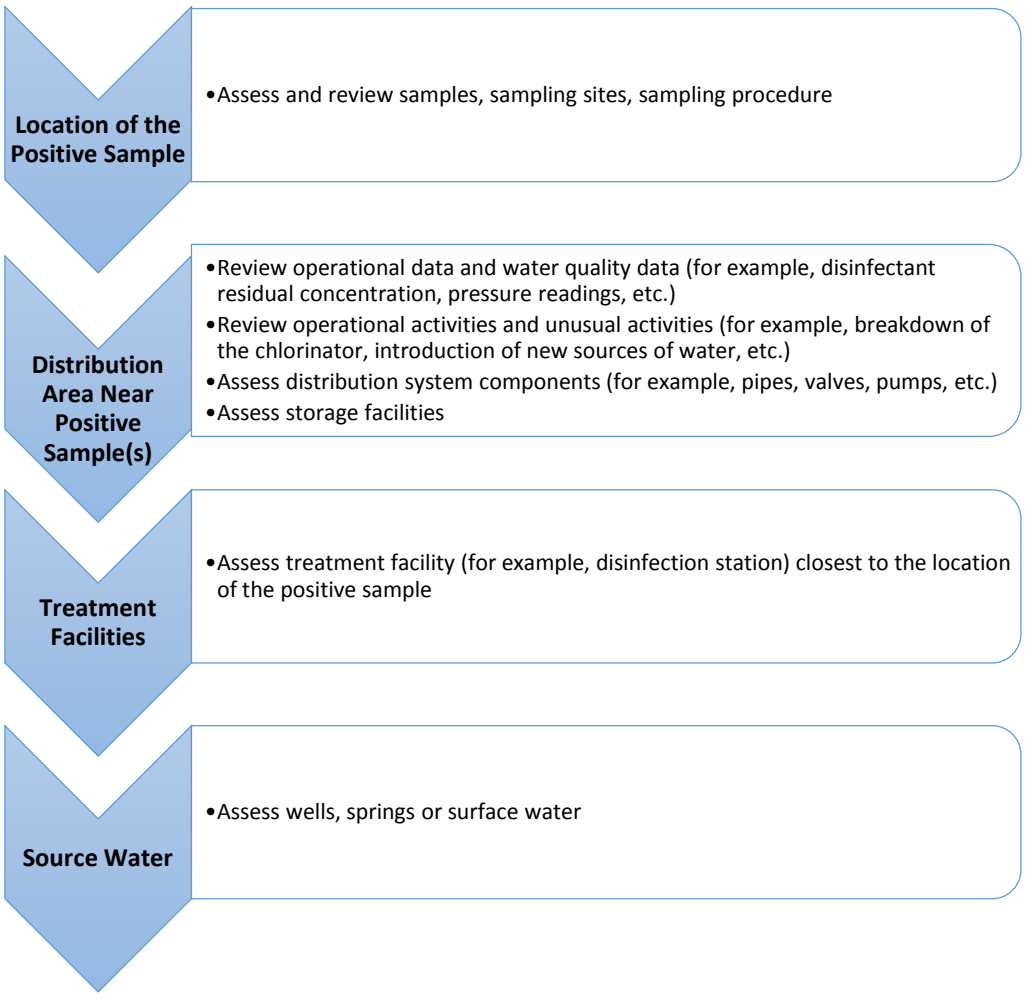
Assessment Forms

Water systems should check with their drinking water primacy agency to determine which assessment forms they are required to use and complete and where to submit them.

Conducting a Level 1 or Level 2 Assessment

Figure A-4 shows steps that the assessor can follow when conducting either assessment. Depending on the layout or the design of the system, not all elements may be present.

Figure A-4. Suggested Steps in Conducting a Level 1 or Level 2 Assessment



Timeline for Completing a Level 1 or Level 2 Assessment

A system must complete a Level 1 or Level 2 assessment, correct any sanitary defects found and submit the assessment form to the drinking water primacy agency **within 30 days** after learning that it has triggered the assessment. If there are corrective actions not completed at the time of the submission of the form, the system must also include a timetable for completing the rest of the corrective actions and report to their drinking water primacy agency when each outstanding corrective action has been completed.

Tips for Preparing for an Assessment

- Determine who can conduct a Level 1 and Level 2 assessment.
- Be familiar with the state's required forms and submittals.
- Create a standard operating procedure (SOP) for what to do when sampling results trigger an assessment.
- Understand which data source(s) to use to fill out the various sections of the form.
- Contact your drinking water primacy agency if you have any questions about the requirements.

A.3.4. Reporting and Recordkeeping

Systems need to report certain information to their drinking water primacy agencies within a required timeframe and keep certain records. **Table A-1** lists the items to report and **Table A-2** lists the records to keep.

Table A-1. Items Water Systems Need to Report

What to report	When to report to the drinking water primacy agency
Monitoring results	Within the first 10 days following either the end of the month the monitoring was completed, or the end of the required monitoring period, whichever is sooner. The system does not need to report this in the case where the state laboratory does the analysis and submits the results directly to the primacy agency.
E. coli-positive routine sample	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 primacy agency office is closed and the primacy agency does not have either an after-hours phone line or an alternative notification procedure. In this case, the system must notify the agency before the end of the next business day.
E. coli MCL violation[1]	By the end of the day when the system learns of an *E. coli* MCL violation, unless the system learns of the violation after the primacy agency office is closed and the primacy agency does not have either an after-hours phone line or an alternative notification procedure. In this case, the system must notify the primacy agency before the end of the next business day and notify the public within 24 hours of the violation.
Coliform treatment technique violation[1]	No later than the end of the next business day after the system learns of the violation. The public must be notified within 30 days.
Monitoring violation[1]	Within 10 days after the system learns of the violation. The public must be notified within a year of the violation.
Completed assessment form	Within 30 days after learning that the system has triggered an assessment.
Corrective action(s) not completed when assessment form was submitted	When corrective action is completed.

[1] Violations are discussed in **Section A.3.5** of this guide.

What to report	When to report to the drinking water primacy agency
Seasonal systems – certification of completion of primacy agency-approved start-up procedure	Prior to serving water to the public.
Certification of compliance with public notice requirements	Within 10 days of completing the public notification (whether initial notification or repeat notification).
Failure to comply with any of the requirements of the RTCR not already mentioned above	Within 48 hours of failing to comply with the requirement.

Table A-2. Records Water Systems Need to Keep

Records	Period of Time to Keep Records
Monitoring results	No less than 5 years.
Assessment forms[2] and documentation of corrective actions completed[3]	No less than 5 years after completion of the assessment and corrective action(s).
Repeat samples taken that meet drinking water primacy agency criteria for extension of 24-hour period for collection	No less than 5 years.
Copies of public notice (PN) issued and certification of compliance with PN regulations	No less than 3 years after issuance.
Sample siting plans	No less than 5 years (same period as records of microbiological analyses).

[2] Water systems should keep completed assessment forms regardless of who conducted the assessment.
[3] Or other available documentation of sanitary defects and corrective actions. EPA recommends that the system keep any photos, receipts, sample results, etc., related to assessments and corrective actions.

A.3.5. Violations and Public Notification

Systems that fail to perform a requirement are in violation of the rule. Some violations require a public notification, as shown in **Table A-3.** Systems should check with their drinking water primacy agency about the required language for public notices.

Table A-3. List of Violations and the Required Public Notification

Violation	Public Notification
***E. coli* MCL** • **Routine** total coliform-positive; **repeat** *E. coli*-positive • **Routine** *E. coli*-positive; **repeat** total coliform-positive • **Routine** *E. coli+*; system fails to take all **repeat** samples • **Repeat** total coliform-positive; sample not tested for *E. coli*	Tier 1 (issued within 24 hours)
Treatment technique • System fails to conduct the required assessment within required timeframe after exceeding a trigger. • System fails to complete required corrective action within required timeframe after identifying a sanitary defect. • Seasonal system fails to complete primacy agency-approved start-up procedure prior to serving water to the public.	Tier 2 (issued within 30 days)
Monitoring • System fails to collect all required routine or additional routine samples in a compliance period. • Routine total coliform-positive; sample not tested for *E. coli*	Tier 3 (issued within a year)
Reporting • System fails to submit monitoring report or completed assessment form after properly conducting monitoring or assessment in a timely manner. • System fails to notify its primacy agency of an *E. coli*-positive sample in a timely manner. • Seasonal system fails to submit certification of completion of a primacy agency-approved start-up procedure.	Tier 3 (issued within a year)