

TITLE 10 -- DEPARTMENT OF NATURAL RESOURCES
DIVISION 60 – SAFE DRINKING WATER COMMISSION
Chapter 4 – Contaminant Levels and Monitoring

PROPOSED NEW RULE

10 CSR 60-4.022 Revised Total Coliform Rule

PURPOSE: The rule establishes sampling and monitoring requirements for public water systems. The rule also establishes a maximum contaminant level (MCL) for *E. coli* and uses *E. coli* and total coliforms to initiate a “find and fix” approach to address fecal contamination that could enter into the distribution system. It requires public water systems to perform assessments to identify sanitary defects and subsequently take corrective action to correct them. The rule sets monitoring and treatment technique requirements for seasonal systems. At the beginning of each operating period, before serving water to the public, seasonal systems meeting criteria must conduct state-approved start-up procedures and certify completion of start-up procedures. The rule is based on the requirements in the federal Revised Total Coliform Rule found in subpart Y of 40 CFR part 141.

(1) General Requirements and Applicability.

(A) The provisions of this rule include both maximum contaminant level and treatment technique requirements.

(B) Applicability. The provisions of this rule apply to all public water systems.

(C) Compliance date. Systems must comply with the provisions of this rule beginning April 1, 2016, unless otherwise specified in this rule.

(D) Violations of national primary drinking water regulations. Failure to comply with the applicable requirements of this rule, including requirements established by the department pursuant to these provisions, is a violation of the National Primary Drinking Water Regulations.

(2) Analytical methods and laboratory certification.

(A) Analytical methodology.

1. The standard sample volume required for analysis, regardless of analytical method used, is 100 ml.

2. Systems need only determine the presence or absence of total coliforms and *E. coli*; a determination of density is not required.

3. The time from sample collection to initiation of test medium incubation may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10 deg. C during transit.

4. If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of *Standard Methods for the Examination of Water and Wastewater* (20th and 21st editions).

5. Total coliform and *E. coli* analyses must be conducted in accordance with one (1) of the analytical methods or alternative methods incorporated by reference in 10 CSR 60-5.010(3).

(B) Laboratory Certification. Systems must have all compliance samples required under this rule analyzed by a laboratory certified by the EPA or the department to analyze drinking water samples. The laboratory used by the system must be certified for each method (and associated contaminant(s)) used for compliance monitoring analyses under this rule.

(3) General monitoring requirements for all public water systems.

(A) Sample siting plans.

1. Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system no later than March 31, 2016. These plans are subject to department review and revision. Systems must collect total coliform samples according to the written sample siting plan. Monitoring required by section (4) through (8) of this rule may take place at a customer's premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of 10 CSR 60-4.025 must be reflected in the sampling plan.

2. The minimum monitoring frequency for total coliforms is based on the population served by the system as defined in the chart in section (7) of this rule except that systems using surface water or ground water under the direct influence of surface water or systems practicing iron removal or lime softening must collect at least five (5) samples per month. Unless the department approves or specifies in writing of a lesser frequency based on population and system type as defined in sections (4)-(7) of this rule, systems must monitor each calendar month that the system provides water to the public. Systems must collect samples at regular time intervals throughout the month, except that systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

3. Systems must take at least the minimum number of required samples even if the system has had an *E. coli* maximum contaminant level (MCL) violation or has exceeded the coliform treatment technique triggers in subsection (9)(A) of this rule.

4. A system may conduct more compliance monitoring than is required by this rule to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine samples and must include the results in calculating whether the coliform treatment technique trigger in subparagraphs (9)(A)1.A.-B. of this rule has been exceeded only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.

5. Systems must identify repeat monitoring locations in the sample siting plan. Unless the provisions of subparagraphs (3)(A)5.A. or B. of this rule are met, the system must collect at least one (1) repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one (1) repeat sample at a tap within five (5) service connections upstream and at least one (1) repeat sample at a tap within five (5) service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one (1) service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the department may allow an alternative sampling location instead of the requirement to collect at least one (1) repeat sample upstream or downstream of the original sampling site. Except as provided for in subparagraph (3)(A)5.B. of this rule, systems required to conduct triggered

source water monitoring under 10 CSR 60–4.025(3)(A) must take ground water source sample(s) in addition to repeat samples required under this rule.

A. Systems may propose repeat monitoring locations to the department that the system believes to be representative of a pathway for contamination of the distribution system. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The system must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The department may modify the SOP or require alternative monitoring locations as needed.

B. Ground water systems serving 1,000 or fewer people may propose repeat sampling locations to the department that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A ground water system with a single well required to conduct triggered source water monitoring may, with written department approval, take one (1) of its repeat samples at the monitoring location required for triggered source water monitoring under 10 CSR 60-4.025(3)(A) if the system demonstrates to the department's satisfaction that the sample siting plan remains representative of water quality in the distribution system. If approved by the department, the system may use that sample result to meet the monitoring requirements in both 10 CSR 60-4.025(3)(A) and this section.

(I) If a repeat sample taken at the monitoring location required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL and must also comply with 10 CSR 60-4.025(3)(A)3. If a system takes more than one (1) repeat sample at the monitoring location required for triggered source water monitoring, the system may reduce the number of additional source water samples required under 10 CSR 60-4.025(3)(A)3. by the number of repeat samples taken at that location that were not *E. coli*-positive.

(II) If a system takes more than one (1) repeat sample at the monitoring location required for triggered source water monitoring under 10 CSR 60-4.025(3)(A) and more than one (1) repeat sample is *E. coli*-positive, the system has violated the *E. coli* MCL and must also comply with 10 CSR 60-4.025(4)(A)1.

(III) If all repeat samples taken at the monitoring location required for triggered source water monitoring are *E. coli*-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL, but is not required to comply with 10 CSR 60-4.025(3)(A)3.

6. The department may review, revise, and approve, as appropriate, repeat sampling proposed by systems under subparagraphs (3)(A)5.A.-B. of this rule. The system must demonstrate that the sample siting plan remains representative of the water quality in the distribution system. The department may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

(B) Special purpose samples. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples taken pursuant to section (8) of this rule are not considered special

purpose samples and must be used to determine whether the coliform treatment technique trigger has been exceeded.

(C) Invalidation of total coliform samples. A total coliform-positive sample invalidated under this subsection (3)(C) does not count toward meeting the minimum monitoring requirements of this rule.

1. The department may invalidate a total coliform-positive sample only if any of the following conditions are met.

A. The laboratory establishes that improper sample analysis caused the total coliform-positive result.

B. The department, on the basis of the results of repeat samples collected as required under subsection (8)(A) of this rule, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The department cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform-negative [e.g., the department cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the system has only one (1) service connection].

C. The department has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under subsection (8)(A) of this rule, and use them to determine whether a coliform treatment technique trigger in section (9) of this rule has been exceeded. To invalidate a total coliform-positive sample under this subsection, the decision and supporting rationale must be documented in writing, and approved and signed by the supervisor of the department official who recommended the decision. The department must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

2. A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within twenty-four (24) hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within twenty-four (24) hours and have the samples analyzed until it obtains a valid result. The department may waive the twenty-four (24)-hour time limit on a case-by-case basis. Alternatively, the department may implement criteria for waiving the twenty-four (24)-hour sampling time limit to use in lieu of case-by-case extensions.

(4) Routine monitoring requirements for non-community water systems serving 1,000 or fewer people using only ground water.

(A) General monitoring requirements.

1. The provisions of this section apply to non-community water systems using only ground water (except ground water under the direct influence of surface water, as defined in 10 CSR 60-2.015) and serving 1,000 or fewer people.

2. Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in section (8) of this rule.

3. Once all monitoring required by this section and section (8) of this rule for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in section (9) of this rule have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by section (9) of this rule.

4. For the purpose of determining eligibility for remaining on or qualifying for quarterly monitoring under the provisions of paragraphs (4)(F)4. and (4)(G)2., respectively, of this rule for transient non-community water systems, the department may elect to not count monitoring violations under paragraph (10)(C)1. of this rule if the missed sample is collected no later than the end of the monitoring period following the monitoring period in which the sample was missed. The system must collect the make-up sample in a different week than the routine sample for that monitoring period and should collect the sample as soon as possible during the monitoring period. The department may not use this provision under subsection (H) of this section. This authority does not affect the provisions of paragraph (10)(C)1. of this rule and 10 CSR 60-7.010(12)(D).

(B) Monitoring frequency for total coliforms. Unless the department approves of a lesser frequency in writing, the minimum monitoring frequency for total coliforms is one (1) sample per month except that systems practicing iron removal or lime softening must collect at least five (5) routine samples per month. In addition, the department may require a greater frequency if necessary. Seasonal systems must meet the monitoring requirements of subsection (4)(I) of this rule. With written department approval, systems must monitor each calendar quarter that the system provides water to the public, except for seasonal systems or as provided under subsections (4)(C)-(H) and (4)(J) of this rule.

(C) Transition to the Revised Total Coliform Rule.

1. Systems, including seasonal systems, must continue to monitor according to the total coliform monitoring schedules under 10 CSR 60-4.020 that were in effect on March 31, 2016, unless any of the conditions for increased monitoring in subsection (4)(F) of this rule are triggered on or after April 1, 2016, or unless otherwise directed by the department.

2. Beginning April 1, 2016, the department will perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the department has performed the special monitoring evaluation during each sanitary survey, the department may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of this section (4). The department may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in this section. For seasonal systems on quarterly or annual monitoring, this evaluation must include review of the approved sample siting plan, which must designate the time period(s) for monitoring based on site-specific considerations (e.g., during periods of

highest demand or highest vulnerability to contamination). The seasonal system must collect compliance samples during these time periods.

(D) Annual site visits. Beginning no later than calendar year 2017, systems on annual monitoring, including seasonal systems, must have an initial and recurring annual site visit by the department that is equivalent to a Level 2 assessment or an annual voluntary Level 2 assessment that meets the criteria in subsection (9)(B) to remain on annual monitoring. The periodic required sanitary survey may be used to meet the requirement for an annual site visit for the year in which the sanitary survey was completed.

(E) Criteria for annual monitoring. Beginning April 1, 2016, the department may reduce the monitoring frequency for a well-operated ground water system from quarterly routine monitoring to no less than annual monitoring, if the system demonstrates that it meets the criteria for reduced monitoring in paragraphs (4)(E) 1.-3. of this rule, except for a system that has been on increased monitoring under the provisions of subsection (4)(F) of this rule. A system on increased monitoring under subsection (4)(F) of this rule must meet the provisions of subsection (4)(G) of this rule to go to quarterly monitoring and must meet the provisions of subsection (4)(H) of this rule to go to annual monitoring.

1. The system has a clean compliance history for a minimum of twelve (12) months;

2. The most recent sanitary survey shows that the system is free of sanitary defects or has corrected all identified sanitary defects, has a protected water source, and meets approved construction standards; and

3. The department has conducted an annual site visit within the last twelve (12) months and the system has corrected all identified sanitary defects. The system may substitute a Level 2 assessment that meets the criteria in subsection (9)(B) of this rule for the department annual site visit.

(F) Increased Monitoring Requirements for systems on quarterly or annual monitoring. A system on quarterly or annual monitoring that experiences any of the events identified in paragraphs (F) 1. through (F) 4. of this section must begin monthly monitoring the month following the event. A system on annual monitoring that experiences the event identified in paragraphs (F) 5. of this section must begin quarterly monitoring the quarter following the event. The system must continue monthly or quarterly monitoring until the requirements in subsection (G) of this section for quarterly monitoring or subsection (H) of this section for annual monitoring are met. A system on monthly monitoring for reasons other than those identified in paragraphs (F) 1. through (F) 4. of this section is not considered to be on increased monitoring for the purposes of subsections (G) and (H) of this section.

1. The system triggers a Level 2 assessment or two Level 1 assessments under the provisions of section (9) in a rolling twelve (12) month period.

2. The system has an *E. coli* MCL violation.

3. The system has a coliform treatment technique violation.

4. The system has two Revised Total Coliform Rule monitoring violations or one Revised Total Coliform Rule monitoring violation and one Level 1 assessment under the provisions of section (9) in a rolling twelve (12) month period for a system on quarterly monitoring.

5. The system has one Revised Total Coliform Rule monitoring violation for a system on annual monitoring.

(G) Requirements for returning to quarterly monitoring. The department may reduce the monitoring frequency for a system on monthly monitoring triggered under subsection (F) of this section to quarterly monitoring if the system meets the criteria in paragraphs (G) 1. and (G) 2. of this section.

1. Within the last twelve (12) months, the system must have a completed sanitary survey or a site visit by the department or a voluntary Level 2 assessment by a party approved by the department, be free of sanitary defects, and have a protected water source; and

2. The system must have a clean compliance history for a minimum of twelve (12) months.

(H) Requirements for systems on increased monitoring to qualify for annual monitoring. The department may reduce the monitoring frequency for a system on increased monitoring under subsection (F) of this section if the system meets the criteria in subsection (G) of this section plus the criteria in paragraphs (H) 1. and (H) 2. of this section.

1. An annual site visit by the department and correction of all identified sanitary defects. The system may substitute a voluntary Level 2 assessment by a party approved by the department for the department annual site visit in any given year.

2. The system must have in place or adopt one or more additional enhancements to the water system barriers to contamination in subparagraphs (H) 2. A. through (H) 2. E. of this section.

A. Cross connection control, as approved by the department.

B. An operator certified by an appropriate department certification program or regular visits by a circuit rider certified by an appropriate department certification program.

C. Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the department.

D. Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under 10 CSR 60-4.025(4)(B)3.

E. Other equivalent enhancements to water system barriers as approved by the department.

(I) Seasonal systems.

1. Beginning April 1, 2016, all seasonal systems must demonstrate completion of a department-approved start-up procedure, which may include a requirement for startup sampling prior to serving water to the public.

2. A seasonal system must monitor every month that it is in operation unless it meets the criteria in subparagraphs (I)2.A. through (I)2.C. of this section to be eligible for monitoring less frequently than monthly beginning April 1, 2016, except as provided under subsection (4)(C) of this rule.

A. Seasonal systems monitoring less frequently than monthly must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). Seasonal systems must collect compliance samples during this time period.

B. To be eligible for quarterly monitoring, the system must meet the criteria in subsection (G) of this section.

C. To be eligible for annual monitoring, the system must meet the criteria under subsection (H) of this section.

3. The department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating, except that systems that monitor less frequently than monthly must still monitor during the vulnerable period designated by the department.

(J) Additional routine monitoring the month following a total coliform-positive sample. Systems collecting samples on a quarterly or annual frequency must conduct additional routine monitoring the month following one (1) or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three (3) routine samples during the next month, except that the department may waive this requirement if the conditions of paragraphs (4)(J) 1.-3. of this rule are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations under subsection (9)(A) of this rule.

1. The department may waive the requirement to collect three (3) routine samples the next month in which the system provides water to the public if the department, or an agent approved by the department, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the department to determine whether additional monitoring and/or any corrective action is needed. The department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the department to perform sanitary surveys.

2. The department may waive the requirement to collect three (3) routine samples the next month in which the system provides water to the public if the department has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the department must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the department official who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

3. The department may not waive the requirement to collect three (3) additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the department determines that the system has corrected the contamination problem before the system takes the set of repeat samples required in section (8) of this rule, and all repeat samples were total coliform-negative, the department may waive the requirement for additional routine monitoring the next month.

(5) Routine monitoring requirements for community water systems serving 1,000 or fewer people using only ground water.

(A) General Routine Monitoring.

1. The provisions of this section apply to community water systems using only ground water (except ground water under the direct influence of surface water, as defined in 10 CSR 60-2.015) and serving 1,000 or fewer people.

2. Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in section (8) of this rule.

3. Once all monitoring required by this section (5) and section (8) of this rule for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in section (9) of this rule have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by section (9) of this rule.

(B) Monitoring frequency for total coliforms. Unless the department approves of a lesser frequency in writing as provided for under subsections (5)(C)-(F) of this rule, the monitoring frequency for total coliform is one (1) sample per month except that systems practicing iron removal or lime softening must collect at least five (5) routine samples per month.

(C) Transition to the Revised Total Coliform Rule.

1. All systems must continue to monitor according to the total coliform monitoring schedules under 10 CSR 60-4.020 that were in effect on March 31, 2016, unless any of the conditions in subsection (5)(E) of this rule are triggered on or after April 1, 2016, or unless otherwise directed by the department.

2. Beginning April 1, 2016, the department must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the department has performed the special monitoring evaluation during each sanitary survey, the department may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of this section. The department may not allow systems to begin less frequent monitoring under the special monitoring evaluation unless the system has already met the applicable criteria for less frequent monitoring in this section.

(D) Criteria for reduced monitoring.

1. The department may reduce the monitoring frequency from monthly monitoring to no less than quarterly monitoring if the system is in compliance with department-certified operator provisions and demonstrates that it meets the criteria in subparagraphs (5)(D) 1.A.-C. of this rule. A system that loses its certified operator must return to monthly monitoring the month following that loss.

A. The system has a clean compliance history for a minimum of twelve (12) months.

B. The most recent sanitary survey shows the system is free of sanitary defects (or has an approved plan and schedule to correct them and is in compliance with the plan and the schedule), has a protected water source and meets approved construction standards.

C. The system meets at least one (1) of the following criteria:

(I) The system had an annual site visit by the department that is equivalent to a Level 2 assessment or an annual Level 2 assessment by a party approved by the department and correction of all identified sanitary defects (or the system has an approved plan and schedule to correct them and is in compliance with the plan and schedule).

(II) The system has cross connection control, as approved by the department.

(III) The system has continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the department.

(IV) The system has a demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under 10 CSR 60-4.025(4)(B)3.

(V) Other equivalent enhancements to water system barriers as approved by the department.

(E) Return to routine monthly monitoring requirements. Systems on quarterly monitoring that experience any of the events in paragraphs (5)(E)1.-4. of this rule must begin monthly monitoring the month following the event. The system must continue monthly monitoring until it meets the reduced monitoring requirements in subsection (5)(D) of this rule.

1. The system triggers a Level 2 assessment or two Level 1 assessments in a rolling twelve (12) month period.

2. The system has an *E. coli* MCL violation.

3. The system has a coliform treatment technique violation.

4. The system has two Revised Total Coliform Rule monitoring violations in a rolling twelve (12) month period.

(F) Additional routine monitoring the month following a total coliform-positive sample. Systems collecting samples on a quarterly frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three (3) routine samples during the next month, except that the department may waive this requirement if the conditions of paragraphs (5)(F)1., 2 or 3. of this rule are met. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations.

1. The department may waive the requirement to collect three (3) routine samples the next month in which the system provides water to the public if the department, or an agent approved by the department, performs a site visit before the end of the next month in which the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the department to determine whether additional monitoring or any corrective action, or both, is needed. The department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the department to perform sanitary surveys.

2. The department may waive the requirement to collect three (3) routine samples the next month in which the system provides water to the public if the department has determined why the sample was total coliform-positive and has established that the system has corrected the problem or will correct the problem before the end of the next month in which the system serves water to the public. In this case, the department must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the department official who recommends such a decision, and make this document available to the U.S. EPA and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem.

3. The department may not waive the requirement to collect three (3) additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the department determines that the system has corrected the contamination problem before the system takes the set of repeat

samples required in section (8) of this rule, and all repeat samples were total coliform-negative, the department may waive the requirement for additional routine monitoring the next month.

(6) Routine monitoring requirements for surface water and ground water under the direct influence of surface water public water systems serving 1,000 or fewer people.

(A) General Routine Monitoring.

1. This section (6) applies to surface water and ground water under the direct influence of surface water systems serving 1,000 or fewer people.

2. Following any total coliform-positive sample taken under the provisions of this section (6), systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in section (8) of this rule.

3. Once all monitoring required by this section (6) and section (8) of this rule for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in section (9) have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by section (9) of this rule.

4. Seasonal systems.

A. Beginning April 1, 2016, all seasonal systems must demonstrate completion of a department-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

B. The department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(B) Routine monitoring frequency for total coliforms. Surface water and groundwater under the direct influence of surface water systems (including consecutive systems) must monitor monthly. Systems may not reduce monitoring. Primary public water systems must collect a minimum of five (5) routine samples per month. In addition, the department may require a greater frequency if necessary.

(7) Routine monitoring requirements for public water systems serving more than 1,000 people.

(A) General Routine Monitoring.

1. The provisions of this section apply to public water systems serving more than 1,000 persons.

2. Following any total coliform-positive sample taken under the provisions of this section, systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in section (8) of this rule.

3. Once all monitoring required by this section and section (8) of this rule for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in section (9) of this rule have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by section (9) of this rule.

4. Seasonal systems.

A. Beginning April 1, 2016, all seasonal systems must demonstrate completion of a department-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

B. The department may exempt any seasonal system from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating.

(B) Monitoring frequency for total coliforms. The monitoring frequency for total coliforms is based on the population served by the system, as follows, except for systems using surface water or groundwater under the direct influence of surface water or practicing iron removal or lime softening must collect a minimum of five (5) routine samples per month:

Total Coliform Monitoring Frequency for Public Water Systems Serving
More Than 1,000 People

Population served	Minimum number of samples per month
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

(C) Reduced monitoring. Systems may not reduce monitoring, except for non-community water systems using only ground water (and not ground water under the direct influence of surface water) serving 1,000 or fewer people in some months and more than 1,000 persons in other months. In months when more than 1,000 persons are served, the systems must monitor at the frequency specified in subsection (7)(B) of this rule. In months when 1,000 or fewer people are served, the department may reduce the monitoring frequency, in writing, to a frequency allowed under section (4) of this rule for a similarly situated system that always serves 1,000 or fewer people, taking into account the provisions in subsection (7)(E)-(G) of this rule.

(8) Repeat monitoring and *E. coli* requirements.

(A) Repeat monitoring.

1. If a sample taken under sections (8)(4)-(7) of this rule is total coliform-positive, the system must collect a set of repeat samples within twenty-four (24) hours of being notified of the positive result. The system must collect no fewer than three (3) repeat samples for each total coliform-positive sample found. The department may extend the twenty-four (24) hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within twenty-four (24) hours that is beyond its control. Alternatively, the department may implement criteria for the system to use in lieu of case-by-case extensions. In the case of an extension, the department must specify how much time the system has to collect the repeat samples. The department cannot waive the requirement for a system to collect repeat samples in paragraphs (8)(A)1.-3. of this rule.

2. The system must collect all repeat samples on the same day, except that the department may allow a system with a single service connection to collect the required set of repeat samples over a three (3)-day period or to collect a larger volume repeat sample(s) in one (1) or more sample containers of any size, as long as the total volume collected is at least three hundred milliliters (300 ml). Systems with more than one (1) service connection, but fewer service connections than the required number of repeat samples, shall collect repeat samples as directed by the department.

3. The system must collect an additional set of repeat samples in the manner specified in paragraphs (8)(A)1.-3. of this rule if one (1) or more repeat samples in the current set of repeat samples is total coliform-positive. The system must collect the additional set of repeat samples within twenty-four (24) hours of being notified of the positive result, unless the department extends the limit as provided in paragraph (8)(A)1. of this rule. The system must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the system determines that a coliform treatment technique trigger specified in subsection (9)(A) of this rule has been exceeded as a result of a repeat sample being total coliform-positive and notifies the department. If a trigger identified in section (9) of this rule is exceeded as a result of a routine sample being total coliform-positive, systems are required to conduct only one (1) round of repeat monitoring for each total coliform-positive routine sample.

4. After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five (5) adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

5. Results of all routine and repeat samples taken under sections (4)-(8) of this rule not invalidated by the department must be used to determine whether a coliform treatment technique trigger specified in section (9) of this rule has been exceeded.

(B) *Escherichia coli* (*E. coli*) testing.

1. If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if *E. coli* are present. If *E. coli* are present, the system must notify the department by the end of the day when the system is notified of the test result, unless the system is notified of the result after the department office is closed and the department does not have either an after-hours phone line or an alternative

notification procedure, in which case the system must notify the department before the end of the next business day.

2. The department has the discretion to allow a system, on a case-by-case basis, to forgo *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is *E. coli*-positive. Accordingly, the system must notify the department as specified in paragraph (8)(B)1. of this rule and the provisions of 10 CSR 60-4.020(7)(C) apply.

(9) Coliform treatment technique triggers and assessment requirements for protection against potential fecal contamination.

(A) Treatment technique triggers. Systems must conduct assessments in accordance with subsection (9)(B) of this rule after exceeding treatment technique triggers in paragraphs (9)(A)1. and (9)(A)2. of this rule..

1. Level 1 treatment technique triggers.

A. For systems taking forty (40) or more samples per month, the system exceeds 5.0% total coliform-positive samples for the month.

B. For systems taking fewer than forty (40) samples per month, the system has two (2) or more total coliform-positive samples in the same month.

C. The system fails to take every required repeat sample after any single total coliform-positive sample.

2. Level 2 treatment technique triggers.

A. An *E. coli* MCL violation, as specified in section (10) of this rule.

B. A second Level 1 trigger as defined in paragraph (9)(A)1. of this rule, within a rolling twelve (12) month period, unless the department has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem.

C. For systems with approved annual monitoring, a Level 1 trigger in two (2) consecutive years.

(B) Requirements for assessments.

1. Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the department.

2. When conducting assessments, systems must ensure that the person performing the assessment evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

3. Level 1 Assessments. A system must conduct a Level 1 assessment consistent with department requirements if the system exceeds one (1) of the treatment technique triggers in paragraph (9)(A)1. of this rule. The Level 1 assessment must be conducted consistent with any

department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

A. The system must complete a Level 1 assessment as soon as practical after any trigger in paragraph (9)(A)1. of this rule. In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the department within thirty (30) days after the system learns that it has exceeded a trigger.

B. If the department reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the department must consult with the system. If the department requires revisions after consultation, the system must submit a revised assessment form to the department on an agreed-upon schedule not to exceed thirty (30) days from the date of the consultation.

C. Upon completion and submission of the assessment form by the system, the department must determine if the system has identified a likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to the department for correcting the problem.

4. Level 2 Assessments. A system must ensure that a Level 2 assessment consistent with department requirements is conducted if the system exceeds one of the treatment technique triggers in paragraph (9)(A)2. of this rule. The Level 2 assessment must be conducted consistent with any department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the department in the case of an *E. coli* MCL violation.

A. The system must ensure that a Level 2 assessment is completed by the department or by a party approved by the department as soon as practical after any trigger in paragraph (9)(A)2. of this rule. The system must submit a completed Level 2 assessment form to the department within thirty (30) days after the system learns that it has exceeded a trigger. The assessment form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified.

B. The system may conduct Level 2 assessments if the system has staff or management with the certification or qualifications specified by the department unless otherwise directed by the department.

C. If the department reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the department must consult with the system. If the department requires revisions after consultation, the system must submit a revised assessment form to the department on an agreed-upon schedule not to exceed thirty (30) days.

D. Upon completion and submission of the assessment form by the system, the department must determine if the system has identified a likely cause for the Level 2 trigger and determine whether the system has corrected the problem, or has included a schedule acceptable to the department for correcting the problem.

(C) Corrective Action. Systems must correct sanitary defects found through either Level 1 or 2 assessments conducted under subsection (9)(B) of this rule. For corrections not completed

by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable approved by the department in consultation with the system. The system must notify the department when each scheduled corrective action is completed.

(D) Consultation. At any time during the assessment or corrective action phase, either the water system or the department may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the department on all relevant information that may impact on its ability to comply with a requirement of this rule, including the method of accomplishment, an appropriate timeframe, and other relevant information.

(10) Violations.

(A) *E. coli* MCL Violation. A system is in violation of the MCL for *E. coli* when any of the conditions identified in paragraphs (10)(A)1.-4. of this rule occur.

1. The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

2. The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

3. The system fails to take all required repeat samples following an *E. coli*-positive routine sample.

4. The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(B) Treatment technique violation.

1. A treatment technique violation occurs when a system exceeds a treatment technique trigger specified in subsection (9)(A) of this rule and then fails to conduct the required assessment or corrective actions within the timeframe specified in subsections (9)(B) and (9)(C) of this rule.

2. A treatment technique violation occurs when a seasonal system fails to complete a department -approved start-up procedure prior to serving water to the public.

(C) Monitoring violations.

1. Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

2. Failure to analyze for *E. coli* following a total coliform-positive routine sample is a monitoring violation.

(D) Reporting violations.

1. Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or assessment in a timely manner is a reporting violation.

2. Failure to notify the department following an *E. coli*-positive sample as required by paragraph (8)(B)1. of this rule in a timely manner is a reporting violation.

3. Failure to submit certification of completion of department -approved start-up procedure by a seasonal system is a reporting violation.

(11) Reporting Requirements. Reporting requirements are in section (12) of 10 CSR 60-7.010 Reporting Requirements.

(12) Record-Keeping Requirements. Recordkeeping requirements are in section (5) of 10 CSR 60-9.010 Requirements for Maintaining Public Water System Records.

AUTHORITY: section 640.100, RSMo Supp. 2014. Original rule filed Aug. 17, 2015.

PUBLIC ENTITY COSTS: This new rule is anticipated to cost Missouri Department of Natural Resources an estimated annual aggregate cost of approximately two hundred eighty-seven thousand five hundred forty-nine dollars (\$287,549) each year the rule is in effect and an estimated one-time cost of approximately fifty-six thousand six hundred seventy dollars (\$56,670). This new rule is anticipated to cost publicly-owned public water systems an estimated annual aggregate costs of one hundred twenty-nine thousand seven hundred ninety-three dollars (\$129,793) and an estimated one-time cost of thirty five thousand three hundred eighty-five dollars (\$35,385). The fiscal note for this proposed rule includes the information relied upon to develop the estimated cost of compliance.

PRIVATE ENTITY COSTS: This amendment is anticipated to cost private entities an estimated aggregate annual cost of one hundred ninety four thousand six hundred eighty-nine dollars (\$194,689) and an estimated one-time cost of forty-three thousand seven hundred fifty-two dollars (\$43,752). The fiscal note for this proposed rule includes the information relied upon to develop the estimated cost of compliance.

NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: The Department of Natural Resources Public Drinking Water Branch will hold a public hearing on this proposed rule at 10:00 a.m. on October 16, 2015 at the Lewis and Clark State Office Building, 1101 Riverside Drive, Jefferson City, Missouri. Any interested person may comment during the public hearing in support of or in opposition to the proposed rule. Written comments postmarked or received by October 19, 2015 will also be accepted. Written comments must be mailed to: Scott Weckenborg, MDNR Public Drinking Water Branch, P.O. Box 176, Jefferson City, MO 65102, or hand-delivered to the Lewis and Clark State Office Building, 1101 Riverside Drive, Jefferson City, Missouri.