



COLORADO

Water Quality
Control Commission

Department of Public Health & Environment

NOTICE OF WRITTEN-COMMENT-ONLY PUBLIC RULEMAKING HEARING BEFORE THE COLORADO WATER QUALITY CONTROL COMMISSION

SUBJECT:

For consideration of the adoption of revisions to the Colorado Primary Drinking Water Regulations, Regulation #11 (5 CCR 1002-11). Revisions proposed by the Water Quality Control Division, along with a proposed Statement of Basis, Specific Statutory Authority and Purpose, are attached to this notice. Proposed revisions are intended to address comments from the U.S. Environmental Protection Agency regarding Colorado’s Revised Total Coliform Rule and to correct various typographical errors.

Proposed new language is shown with double-underlining and proposed deletions are shown with strikeouts. Any alternative proposals related to the subject of this hearing will also be considered.

During the commission’s consideration of whether to approve this notice of rulemaking, the commission determined that there is not a likelihood of significant controversy during the rulemaking process. Therefore, the commission has chosen to pursue an alternative rulemaking process consistent with section 24-4-103(4)(a) C.R.S.; and section 21.3(C)(5) of the Procedural Rules. It is the goal of the commission to complete this rulemaking without oral testimony.

SCHEDULE OF IMPORTANT DATES

Proponent’s Initial Comments Due	2/12/2020 5:00 pm	Additional Information Below
Responsive Comments Due	2/26/2020 5:00 pm	Additional Information Below
Rulemaking Deliberations	3/9/2020 9:00 am	Sabin Cleere Conference Room Department of Public Health and Environment 4300 Cherry Creek Drive South Denver, CO 80246

HEARING SUBMITTALS:

For this hearing, the commission will receive all submittals electronically. Submittals must be provided as PDF documents, except for raw data exhibits which may be provided as Excel workbooks. Submittals may be emailed to cdphe.wqcc@state.co.us, provided via an FTP site, CD or flash drive, or otherwise conveyed to the commission office so as to be received no later than the specified date.

PARTY STATUS:

Pursuant to section 21.3.C.5 and Section 21.3.D. of the commission's Procedural Rules, there shall be no party status for this rulemaking proceeding.

WRITTEN COMMENTS:

The commission encourages input from interested members of the public. Written comments should be emailed to cdphe.wqcc@state.co.us by 5:00 pm on 2/26/2020.

SPECIFIC STATUTORY AUTHORITY:

The provisions of sections 25-1.5-202; 25-8-202(1)(n); and 25-8-401 C.R.S. provide the specific statutory authority for consideration of the regulatory amendments proposed by this notice. Should the commission adopt the regulatory language as proposed in this notice or alternative amendments, it will also adopt, in compliance with section 24-4-103(4) C.R.S., an appropriate Statement of Basis, Specific Statutory Authority, and Purpose.

Dated this 12th day of November, 2019 at Denver, Colorado.

WATER QUALITY CONTROL COMMISSION

A handwritten signature in dark ink, appearing to read 'Trisha Oeth', written over a horizontal line.

Trisha Oeth, Administrator

- (I) An explanation of why the supplier is unable to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).
 - (II) A distribution system disinfectant residual data analysis demonstrating the inability to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).
 - (III) An engineering report prepared by a professional engineer registered in the state of Colorado demonstrating that capital improvements are necessary to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).
 - (IV) A proposed schedule for completing the system modifications.
- (B) The Department shall consider the following criteria when determining if an extension will be granted:
- (I) The supplier submitted a complete application that included the information specified above;
 - (II) The supplier has complied with the monitoring requirements specified in 11.17 in the last 36 months; and
 - (III) The supplier has not incurred an MCL violation specified in 11.17(9) in the last 36 months.
- (iii) The Department will only grant an extension for up to four years.
- (iv) If the supplier receives written Department-approval for an extension, the supplier must:
- (A) Continue to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(II) and is subject to the violation specified in 11.8(3)(d)(i)(B) until the capital improvements are completed or the extension expires, whichever comes first; and
 - (B) Comply with any Department-specified requirements.
- (c) Monitoring Requirements for Disinfection Treatment Technique Requirements
- (i) To determine compliance with the disinfection treatment technique requirements, the supplier must monitor the residual disinfectant concentration.
 - (A) At each entry point, the supplier must continuously monitor the residual disinfectant concentration.
 - (I) The supplier must record the lowest monitoring result each day.
 - (II) If there is a failure of the continuous monitoring equipment, the supplier must monitor the residual disinfectant concentration by collecting a grab sample no later than four hours after the equipment failure and continue collecting grab samples every four hours until the continuous monitoring equipment is returned to service.

- (a) The supplier must resume continuous residual disinfectant concentration monitoring no later than five working days after the equipment failure.
- (III) For systems supplying less than or equal to (\leq) 3,300 people, the supplier is not required to monitor continuously if the supplier collects grab samples at the frequency specified in Table 11.8-II.
 - (a) If more than one sample per day is required, the supplier must collect the samples throughout the day. The sampling intervals are subject to Department approval.
 - (b) If any grab sample result is less than ($<$) 0.2 mg/L, the supplier must increase the monitoring frequency of the residual disinfectant concentration at that entry point to at least every four hours until the residual disinfectant concentration is greater than or equal to (\geq) 0.2 mg/L.

TABLE 11.8-II MINIMUM GRAB SAMPLES	
Population supplied by the system	Samples per day
≤ 500	1
501 – 1,000	2
1,001 – 2,500	3
2,501 – 3,300	4

- (B) In the distribution system, the supplier must monitor the residual disinfectant concentration at the same time and at the same sampling locations that total coliform samples are collected under 11.16(4).
 - (I) The supplier must measure the residual disinfectant concentration as free chlorine unless the supplier uses a disinfection process that results in a monochloramine residual disinfectant, then the supplier must measure the residual disinfectant concentration as total chlorine. If the supplier uses a different type of chemical disinfectant (e.g., ozone or chlorine dioxide), the supplier must measure the appropriate residual disinfectant concentration.
 - (II) For systems using both surface water and groundwater sources, the Department may allow the supplier to collect residual disinfectant concentration samples at locations other than the total coliform sampling locations if the Department determines that other locations are more representative of finished water quality in the distribution system.

(III) A supplier may monitor for heterotrophic bacteria, measured as Heterotrophic Plate Count (HPC), instead of disinfectant residual, pursuant to 11.8(3)(g).

(d) Treatment Technique Violations for Disinfection

- (i) The following constitute disinfection treatment technique violations:
 - (A) At any entry point, the residual disinfectant concentration is less than ($<$) 0.2 mg/L for more than four hours.

- (B) In the distribution system, the residual disinfectant concentration is not detectable in more than 5 percent of the samples collected in each month, for two consecutive months that the system supplies water to the public.
 - (I) If the Department grants an extension under 11.8(3)(b)(ii), the supplier is subject to this violation after March 31, 2016 and until capital improvements are completed or the extension expires, whichever comes first.
- (C) In the distribution system:
 - (I) If the supplier collects greater than or equal to (\geq) 40 residual disinfectant concentration samples per month, the residual disinfectant concentration is less than ($<$) 0.2 mg/L in more than 5 percent of the samples collected.
 - (II) If the supplier collects greater than ($>$) one but less than ($<$) 40 residual disinfectant concentration samples per monitoring period~~th~~, the residual disinfectant concentration is less than ($<$) 0.2 mg/L in more than one sample collected.
 - (III) If the supplier collects greater than ($>$) one but less than ($<$) 40 residual disinfectant concentration samples per monitoring period~~th~~, the residual disinfectant concentration is less than ($<$) 0.2 mg/L in more than 5 percent of the samples collected in each month for two consecutive months that the system supplies water to the public.
 - (IV) If the supplier collects only one residual disinfectant concentration sample per monitoring period, the residual disinfectant concentration is less than ($<$) 0.2 mg/L.
- (D) Any time the supplier fails to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(A).

(e) Response to Disinfection Treatment Technique Violations

- (i) In the event of an entry point disinfection treatment technique violation as specified in 11.8(3)(d)(i)(A), the supplier must:
 - (A) Notify the Department no later than the end of the next business day.
 - (B) Distribute Tier 2 public notice as specified in 11.33.
- (ii) In the event of a disinfection treatment technique violation as specified in 11.8(3)(d)(i)(B-D), the supplier must:
 - (A) Notify the Department no later than 48 hours after the violation occurs.
 - (B) Distribute Tier 2 public notice as specified in 11.33.

(f) Reporting Requirements for Disinfection Monitoring

- (i) If at any time the entry point residual disinfectant concentration is less than ($<$) 0.2 mg/L, the supplier must notify the Department as soon as possible but no later than the end of the next business day.

(A) The supplier does not provide at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log inactivation and removal) at the entry point to the distribution system for each groundwater source as specified in 11.11(3); and

(B) The supplier is notified that a sample collected under 11.16(4)(b-d) is total coliform-positive and the sample was not invalidated under 11.16(7).

(ii) The supplier is not required to conduct triggered source water monitoring if either of the following conditions are met:

(A) The Department determines and documents in writing that the routine total coliform-positive sample collected under 11.16 was caused by a distribution system deficiency and not by the source water.

(B) The supplier collected the routine total coliform-positive sample collected under 11.16 at a location that meets Department criteria for distribution system conditions that will cause total coliform-positive sample results and therefore the total coliform-positive sample result was not caused by the source water.

(I) No later than 30 days after receiving the total coliform-positive sample result, the supplier must submit documentation that demonstrates the sample location met Department criteria.

(b) Monitoring Requirements for Triggered Source Water Monitoring

(i) The supplier must collect triggered source water monitoring samples no later than 24 hours after being notified of a total coliform-positive sample collected under 11.16(4)(b-d).

(A) If the supplier experiences circumstances beyond their control that prevent the supplier from collecting the source water samples, the Department may extend the 24-hour limit on a case-by-case basis.

(I) If the Department approves the extension, the Department shall specify how much time the supplier has to collect the source water samples.

(ii) The supplier must collect at least one triggered source water monitoring sample from each groundwater source that was in use at the time the total coliform-positive sample was collected. These samples must be collected at the well, before any treatment is applied.

(A) If the system's configuration does not allow for the supplier to sample at the well itself, the Department may:

(I) Approve the collection of triggered source water monitoring samples at a location that represents the water quality of that well or a location after treatment; and/or

(II) Require that sampling equipment be installed at the well itself.

(B) For systems with more than one groundwater source, the Department may approve collection of the triggered source water monitoring samples from a representative groundwater source(s).

- (I) The representative source(s) must supply water to the section of the distribution system where the total coliform-positive sample was collected.
 - (II) If required by the Department, the supplier must submit, for approval, a triggered source water monitoring plan to use a representative source(s).
 - (a) The triggered source water monitoring plan must identify which source(s) the supplier intends to use for representative sampling of groundwater sources. For each representative source identified, the supplier must identify each total coliform sampling location that the source represents in the system's sampling plan specified in 11.16(3).
 - (C) For a groundwater system supplying less than or equal to (\leq) 1,000 people that uses *E. coli* as a fecal indicator for triggered source water monitoring, the supplier may use a triggered source water monitoring sample to meet both the repeat sampling requirements specified in 11.16(5), and the triggered source water monitoring requirements. If the repeat sample collected from the groundwater source is *E. coli*-positive, the supplier must comply with the requirements in 11.11(4)(d).
 - (iii) The supplier must have all groundwater source samples analyzed for the presence of one of the following fecal indicators: *E. coli*, enterococci, or coliphage.
- (c) Additional Triggered Source Water Monitoring Requirements for Consecutive and Wholesale Systems
- (i) For consecutive systems, no later than 24 hours after being notified of the sample result, the supplier responsible for the consecutive system must notify all of their wholesalers of a total coliform-positive sample result collected under 11.16(4)(b-d).
 - (ii) A wholesale system that receives notification from a consecutive system it serves that a sample collected under 11.16(4)(b) is total coliform-positive, the wholesaler must sample all of its groundwater source(s) as specified above in 11.11(4)(b) no later than 24 hours and analyze the samples for a fecal indicator under 11.46(2)(b and e).
- (d) Response to Triggered Source Water Monitoring Fecal Indicator-Positive Sample Results
- (i) If the supplier has a fecal indicator-positive triggered source water monitoring sample result, that is not invalidated under 11.11(4)(e)(i), the supplier must:
 - (A) Notify the Department and initiate consultation no later than 24 hours after being notified of the fecal indicator-positive initial triggered source water monitoring sample result.
 - (B) Distribute Tier 1 public notice as specified in 11.33.
 - (I) For all consecutive systems supplied by the groundwater source that tested positive for a fecal indicator, the supplier responsible for the consecutive system must also distribute Tier 1 public notice to its consumers as specified in 11.33.
 - (C) No later than 24 hours after being notified of the fecal indicator-positive triggered source water monitoring sample result, the supplier must collect five confirmation

- (a) All public water systems must comply with the requirements specified in this rule, unless otherwise specified.
- (b) "CLEAN COMPLIANCE HISTORY" means a record of no MCL violations under 11.45(1), no sampling violations under 11.16(4) and 11.16(5), and no treatment technique triggers or treatment technique violations under 11.16(8) or 11.16(11)(b) for a minimum of 12 months.
- (c) Failure to comply with the applicable requirements of 11.16 is a violation of the Colorado Primary Drinking Water Regulations.
- (d) The supplier must have the system operated by qualified personnel who meet the requirements of Regulation 100, the *Water and Wastewater Facility Operators Certification Requirements*.

11.16(2) Analytical Methods and Laboratory Certification

- (a) Suppliers must analyze all compliance samples, required by 11.16 and 11.46(2), using a Department-certified laboratory using a certified method.

11.16(3) Sample Siting Plan Requirements

- (a) As part of the monitoring plan specified in 11.5, the supplier must develop a written sample siting plan, pursuant to 11.16(4) and 11.16(5), that identifies all of the following:
 - (i) Sampling sites and a sample collection schedule that are representative of water throughout the distribution system. The supplier must collect total coliform samples according to the written sample siting plan. Monitoring required by 11.16(4) and 11.16(5) locations may include a customer's premises, dedicated sampling station, or other designated compliance sampling site. The sample siting plan must include routine and repeat sample sites and any other sampling sites necessary to meet the requirements of 11.11.
 - (ii) Suppliers must identify repeat sample sites in the sample siting plan. Unless the requirements of 11.16(3)(a)(ii)(A) or 11.16(4)(a)(v)(A) are met, the supplier must collect at least one repeat total coliform sample at the site where the original total coliform-positive sample was collected, at least one repeat total coliform sample at a site within five service connections upstream from the site where the original total-coliform positive sample was collected, and at least one repeat total coliform sample at a site within five service connections downstream from the site where the original total-coliform positive sample was collected.
 - (A) Alternatively, suppliers may propose repeat monitoring locations to the Department that the supplier believes to be more representative of a pathway for contamination of the distribution system. A supplier may elect to:
 - (I) Identify alternative fixed repeat sampling sites that the supplier believes to be representative of a pathway for contamination of the distribution system; or
 - (II) Develop criteria for selecting repeat sampling sites on a situational basis that the supplier believes to best verify and determine the extent of potential contamination and a potential pathway for contamination of the distribution system in a standard operating procedure (SOP) that is included in the sampling plan. The Department may modify the SOP or require alternative repeat sampling sites.

- (B) If the supplier collected the original total coliform-positive sample from the end of the distribution system or one site away from the end of the distribution system, the Department may allow an alternative sampling site for collecting repeat samples at the upstream or downstream sites.
- (iii) The Department may review, revise, and approve the written sample siting plan, as specified in 11.16(3). The supplier must demonstrate that the sample siting plan remains representative of the water quality in the distribution system.

11.16(4) Sampling Requirements

- (a) To determine compliance with the MCL for *E. coli* or to determine if a treatment technique is triggered, the supplier must collect total coliform samples as specified in the supplier's sample siting plan in 11.16(3) and as specified in 11.16(4) and 11.16(5).
 - (i) The supplier must collect total coliform samples at regular time intervals throughout the month, except:
 - (A) For groundwater systems that supply less than or equal to (\leq) 4,900 people, the supplier may collect all required samples on a single day if the samples are collected from different sites.
 - (ii) The supplier may collect more samples than the minimum number of routine total coliform samples required as specified in Table 11.16-I as a tool to investigate potential problems in the distribution system.
 - (A) The supplier must use these sample results to determine if a coliform treatment technique in 11.16(8)(a)(i) or 11.16(8)(a)(ii) has been triggered if the supplier collects these samples in accordance with the sample siting plan and are representative of water throughout the distribution system.
 - (iii) If any of the sample results collected under 11.16(4) are total coliform-positive, the supplier must collect repeat samples as specified in 11.16(5), comply with the repeat monitoring requirements in 11.16(5) and *E. coli* analytical requirements in 11.16(4)(e).
 - (iv#) The supplier is not required to submit special purpose samples, as defined in 11.2(5)(78) unless the sample result is *E. coli*-positive and is representative of water in the distribution system. The supplier must submit *E. coli*-positive special purpose sample results to the Department as specified in 11.35(2)(a).
 - (iv) If an *E. coli* MCL violation occurs under 11.16(119) or if a coliform treatment technique is triggered under 11.16(8), the supplier must still collect at least the minimum number of required samples.
 - (v) For groundwater systems, the supplier must collect triggered source water monitoring samples as specified in 11.11(4) in addition to repeat samples required in 11.16(5).
 - (A) For a groundwater system with a single well supplying less than or equal to (\leq) 1,000 people, if the supplier is required to collect a triggered source water monitoring sample, the supplier, with written Department approval, may collect one of the repeat total coliform samples at the sample site required for triggered source water monitoring under 11.11(4), if the supplier demonstrates to the Department's satisfaction that the sample siting plan remains representative of water quality in the distribution system.

- (I) If approved by the Department, the supplier may use the repeat total coliform sample to meet both the triggered source water monitoring requirements specified in 11.11(4) and the total coliform repeat sampling requirements specified in this section, 11.16(5).
- (II) If the repeat sample collected from the groundwater source is *E. coli*-positive, the supplier must comply with the requirements in 11.11(4).

(b) Routine Sampling Requirements for Total Coliform

- (i) For all public water systems, the supplier must collect the number of routine total coliform samples specified in Table 11.16-I each month except:
 - (A) For non-community groundwater systems that supply less than or equal to (\leq) 1,000 people, the supplier must collect one total coliform sample during each quarter that water is supplied to the public, unless the supplier is required to increase the routine sampling frequency as specified in 11.16(4)(c).
 - (I) In any month where the system supplies greater than ($>$) 1,000 people, the supplier must collect the number of routine total coliform samples specified in Table 11.16-I each month.
 - (a) The supplier must have written Department-approval to alternate between quarterly and monthly sampling frequencies based on when the population supplied is less than or equal to (\leq) 1,000 people or when the population supplied is greater than ($>$) 1,000 people.
- (ii) For public water systems that haul water, the water hauler must collect at least one total coliform sample from the outlet port of each tank or container each month that the tank or container is used to supply water to the public.
- (iii) For hand-pumped wells, the supplier must collect at least one total coliform sample from each hand-pumped well each month that it supplies water to the public.
- (iv) For the following public water systems, the supplier is not eligible for a quarterly sampling frequency as specified in 11.16(4)(b)(i)(A):
 - (A) Seasonal systems.
 - (B) Public water systems that do not provide chemical disinfection.
 - (C) Public water systems that haul water.
 - (D) Groundwater systems with hand-pumped wells.
- (v) The Department must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, and determine whether the supplier is on an appropriate monitoring schedule.
 - (A) Based on the Department's special monitoring evaluation, the Department may modify the Supplier's monitoring schedule, consistent with 11.16(4) and 11.16(5), ~~or the Department may allow the supplier to stay on its existing monitoring schedule.~~

TABLE 11.16-I NUMBER OF ROUTINE TOTAL COLIFORM SAMPLES REQUIRED PER MONITORING PERIOD

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

¹ Includes systems that have greater than or equal to (≥) 15 service connections, but supply less than (<) 25 people.

(c) For Non-community Groundwater Systems Supplying Less Than or Equal to (≤) 1,000 People – Increased Routine Sampling Requirements for Total Coliform

- (i) If the supplier is sampling quarterly, the supplier must increase the routine sampling frequency to monthly if any of the following events occur:
 - (A) ~~The supplier triggers a~~ Level 2 assessment ~~is triggered or when~~ two Level 1 assessments under 11.16(8) ~~that~~ occur within a rolling 12-month period.
 - (B) A total coliform treatment technique violation occurs ~~under 11.16(11)(b).~~
 - (C) Two sampling violations under 11.16(4) ~~or 11.16(5)~~ occur ~~in a rolling within 12-month period consecutive months.~~
 - (D) A Level 1 assessment is triggered and a sampling violation ~~of 11.16~~ occurs within ~~a rolling 12-month period consecutive months.~~
 - (E) The supplier receives an *E. coli* MCL violation.
- (ii) The supplier must begin the monthly sampling frequency in the month following the month that the event occurred under 11.16(4)(c)(i).
- (iii) If the supplier is sampling monthly, the Department may allow the supplier to return to a routine quarterly sampling frequency if all of the following criteria are met:
 - (A) Within the last 12 months, the Department or a Department-approved party has completed a sanitary survey or a Level 2 assessment.

- (B) The system is free of sanitary defects and all significant deficiencies have been corrected, has a protected source water, and meets approved construction standards.
- (C) The system's water source(s) is protected from the direct influence of surface water or any other source of contamination.
- (D) The system has a clean compliance history for at least 12 consecutive months.

(d) For Non-community Groundwater Systems Supplying Less Than or Equal to (\leq) 1,000 People – Additional Routine Sampling Requirements in the Month Following a Total Coliform-positive Sample Result

- (i) If the supplier is collecting total coliform samples on a quarterly frequency and one or more of the samples collected is total coliform-positive (with or without a Level 1 treatment technique trigger), the supplier must collect at least three additional routine samples during the following month.
 - (A) The supplier may either collect the samples at regular time intervals throughout the month or collect all required additional routine samples on a single day if the samples are collected from different sites.
- (ii) If any of the additional routine sample results are total coliform-positive, the supplier must collect repeat samples as specified in 11.16(5).
- (iii) The supplier must use the results of additional routine samples to determine whether an *E. coli* MCL violation of 11.16(10) has occurred or if a treatment technique requirement is triggered under 11.16(9).
- (iv) If all three additional routine samples are total coliform-negative, the supplier may return to collecting one total coliform sample on a quarterly sampling frequency. The supplier must begin collecting the quarterly sampling frequency in the calendar quarter following the month that the three additional routine samples were required.

(e) If any routine or repeat sample result is total coliform-positive, the supplier must have a laboratory analyze the total coliform-positive culture medium to determine if *E. coli* are present.

- (i) If any routine sample under 11.16(4), repeat sample under 11.16(5), or special purpose sample result under 11.3(78) is *E. coli*-positive, the supplier must notify the Department no later than the end of the day that the supplier is notified of the sample result.
 - (A) If the supplier is notified of the sample result after the Department is closed, the supplier must contact the Department's after-hours phone line.

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(f) If any routine sample collected under 11.16(4) is total coliform-positive, the supplier must comply with the repeat monitoring requirements in 11.16(5).

11.16(5) Repeat Sampling Requirements for Total Coliform

- (a) For each routine sample result collected under 11.16(4) that is total coliform-positive, the supplier must collect a sample set of at least three repeat total coliform samples no later than 24 hours after being notified of the positive sample result.

- (i) If the supplier has a logistical problem beyond their control that prevents the supplier from collecting the repeat samples within the 24-hour limit, the Department may extend the 24-hour limit on a case-by-case basis.
 - (A) If the Department grants the extension, the Department shall specify how much time the supplier has to collect the repeat samples.
- (ii) The Department shall not waive the requirement to collect repeat samples.
- (b) The supplier must collect repeat samples in accordance with the written sample siting plan required under 11.16(3).
- (c) The supplier must collect all repeat samples on the same day.
 - (i) If the system has only one service connection, the Department may allow the supplier to 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.
- (d) If a treatment technique is triggered based only on routine sample results, the supplier is required to collect only one repeat sample set for each routine total coliform-positive routine sample collected under 11.16(4), and is not required to comply with the requirements specified in 11.16(5)(e).
- (e) If one or more of the repeat sample results is total coliform-positive, the supplier must:
 - (i) Collect an additional repeat sample set as specified in 11.16(5)(a-d) for each site that had a total coliform-positive sample result.
 - (A) The additional repeat sample set(s) must be collected no later than 24 hours after being notified of the total coliform-positive sample result(s), unless the Department extends the 24-hour limit as specified in 11.16(5)(a)(i).
 - (ii) Continue to collect additional repeat sample sets as specified in 11.16(5)(e)(i) until either:
 - (A) Total coliforms are not detected in one complete repeat sample set; or
 - (B) A treatment technique is triggered as specified in 11.16(8) based on total coliform-positive repeat sample results and the supplier has notified the Department.
 - (iii) If a trigger under 11.16(8) is exceeded as a result of a total coliform-positive routine sample, the supplier is required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.
- (f) If the supplier collects a routine sample, which after analysis is found to be total coliform-positive, but before receiving that sample result the supplier collects another routine sample within five service connections of the original sample, the supplier may use the subsequent routine sample as a repeat sample instead of as a routine sample.
- (g) Results of all routine and repeat samples collected under 11.16(4) and or 11.16(5) not invalidated by the Department under 11.16(7) must be used to determine if a coliform treatment technique is triggered under 11.16(8).

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11.16(6) Additional Requirements for Seasonal Systems

- (a) The supplier must complete Department-approved start-up procedures and certify that the start-up procedures were completed before supplying water to the public each season.
 - (i) No later than the 10th of the month following the month that the system began supplying water to the public, the supplier must submit the certification that start-up procedures were completed.
- (b) The supplier must either submit start-up procedures for Department approval or use the pre-approved procedures in the Department's *Revised Total Coliform Rule Start-up Procedures for Seasonal Systems Handbook*.
- (c) As part of the start-up procedures, the supplier must collect a total coliform sample in the distribution system before supplying water to the public.
- (d) All seasonal systems are required to collect monthly bacteriological-total coliform samples, pursuant to 11.16(4), during the operating season according to Table 11.16-I.

11.16(7) Invalidation of Total Coliform Samples

- (a) A total coliform-positive sample result invalidated under 11.16(7)(b) does not count towards meeting the minimum reporting requirements of 11.16(4) and 11.16(5).
- (b) The Department may invalidate a total coliform-positive sample result only if one or more of the following conditions are met:
 - (i) The laboratory establishes that improper sample analysis caused the total coliform-positive sample result.
 - (ii) Based on repeat sample results collected under 11.16(5), the Department determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem that is limited to the specific service connection from which the total coliform sample was collected. The Department shall not invalidate a total coliform-positive sample result on the basis of repeat sample results unless all repeat sample(s) collected at the same site as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a site other than the original site are total coliform-negative. The Department shall not invalidate a total coliform-positive sample result solely on the basis that all repeat sample results are total coliform-negative, or if the system has only one service connection.
 - (iii) The Department has substantial grounds to believe that a total coliform-positive sample result was due to a circumstance or condition that does not reflect water quality in the distribution system. If the Department makes this determination, the supplier must still collect the required number of repeat samples under 11.16(5) and use them to determine if a treatment technique is triggered as specified in 11.16(8). The Department must document the decision and supporting rationale for invalidating a total coliform-positive sample result in writing, have it approved and signed by a supervisor of the Department official who recommended the decision, and make this document available to the EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample result and what action the supplier has taken, or will take, to correct the problem. The Department shall not invalidate a total coliform-positive sample result solely on the basis that all repeat sample results are total coliform-negative.
 - (iv) The laboratory shall invalidate a total coliform-negative sample result (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), the sample produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or the sample exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If the laboratory invalidates a ~~total coliform-negative~~ sample result because of such interferences, the supplier must collect a replacement total coliform sample from the same site as the invalidated sample no later than 24 hours after being notified of the invalidation, and have it analyzed for the presence of total coliforms. The supplier must continue to re-sample within 24 hours and have the samples analyzed for the presence of total coliforms until the supplier obtains a valid result. The Department may extend the 24-hour limit on a case-by-case basis. ~~The supplier must continue to collect replacement total coliform samples until a valid sample result is obtained.~~

- (A) "CONFLUENT GROWTH" means, in the context of bacterial testing, a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.
- (B) "TOO NUMEROUS TO COUNT" means that the total number of bacterial colonies exceeds 200 on a 47-millimeter (mm) diameter membrane filter used for coliform detection.

11.16(8) Total Coliform Treatment Technique Triggers

- (a) The treatment technique triggers for a Level 1 assessment are as follows:
 - (i) If the supplier collects greater than or equal to (\geq) 40 samples per month, more than 5.0 percent of the samples collected for the month are total coliform-positive.
 - (ii) If the supplier collects less than ($<$) 40 samples per month, two or more samples collected for the monitoring period are total coliform-positive.
 - (iii) The supplier fails to collect all required repeat samples after any single total coliform-positive sample.
- (b) The treatment technique triggers for a Level 2 assessment are as follows:
 - (i) An *E. coli* MCL violation occurs as specified in 11.16(11)(a).
 - (ii) A second treatment technique trigger for a Level 1 assessment, as specified in 11.16(8)(a), occurred within 12 consecutive months, except:
 - (A) If the Department has determined the ~~likely reason possible cause~~(s) for the total coliform-positive sample(s) that caused the first Level 1 assessment to be triggered and the Department has established that the supplier has corrected the problem(s).

11.16(9) Treatment Technique Requirements: Level 1 and Level 2 Assessment

- (a) Once all of the monitoring required by 11.16(4) and or 11.16(5) has been completed, the supplier must determine if any treatment technique has been triggered as specified in 11.16(8). If at any time a treatment technique trigger has been exceeded, the supplier must complete the assessments as required by 11.16(9).
- (b) General Requirements for Assessments

- (i) To identify the possible presence of sanitary defects and defects in distribution system coliform sampling practices, the supplier must ensure that a Level 1 or Level 2 assessment is conducted.
 - (ii) The supplier must ensure that the assessor evaluates at least all of the following elements:
 - (A) Inadequacies in sample sites.
 - (B) Inadequacies in sampling protocol.
 - (C) Inadequacies in sample processing.
 - (D) Atypical events that could affect distributed water quality or indicate that distributed water quality was impaired.
 - (E) Changes in distribution system maintenance and operation, including water storage, that could affect distributed water quality.
 - (F) Source and treatment considerations that affect distributed water quality.
 - (G) Existing water quality monitoring data.
 - (iii) The supplier or the Department may request a consultation with the other party at any time during the assessment or corrective action phase. The consultation may be used to determine appropriate actions to be taken or to discuss relevant information that may impact the supplier's ability to comply with the requirements specified in 11.16(9).
 - (iv) If required by the Department, the supplier must ensure that the assessment is conducted consistent with any Department-specified modifications to assessment elements based on the size and type of the system and the size, type, and characteristics of the distribution system.
 - (v) The supplier must correct sanitary defects found through either Level 1 or Level 2 assessments, pursuant to 11.16(9)(b)(ii). If the supplier has not completed corrective action for any sanitary defect before the submission of the assessment form, the supplier, in consultation with the Department, must complete the corrective action(s) on a Department-approved schedule. The supplier must notify the Department when each scheduled corrective action is completed.
- (c) Level 1 Assessments
- (i) If any treatment technique for a Level 1 assessment is triggered under 11.16(8)(a), the supplier must complete a Level 1 assessment, consistent with Department requirements, as soon as practical.
 - (ii) No later than 30 days after learning of a treatment technique trigger for a Level 1 assessment, the supplier must submit for review a completed Level 1 assessment form. In the completed form, the supplier must state whether sanitary defects were identified and if so, describe all of the following:
 - (A) Sanitary defects identified.
 - (B) The likely reasonpossible-cause(s) for the treatment technique trigger.

- (C) If sanitary defects are identified, corrective actions completed.
- (D) If sanitary defects are identified, a proposed schedule for any corrective actions not already completed.

(E) The assessment form may also indicate that no sanitary defects were found.

- (iii) If the Department reviews the Level 1 assessment form and determines that the assessment ~~is~~ was not sufficient or the assessment form is not complete (including any proposed schedule for any corrective actions not already completed), the Department shall consult with the supplier. If the Department requires revisions after consultation, the supplier must submit a revised assessment form to the Department on an agreed-upon date no later than 30 days from the date of the consultation.
- (iv) Upon completion and submission of the assessment form by the supplier, the Department shall determine if the supplier identified the likely reason~~possible cause~~(s) for the Level 1 trigger. If the supplier identified the likely reason~~possible cause~~(s) for the treatment technique trigger, the Department shall determine if the supplier corrected the problem or included a Department-approved schedule for correcting the problem.

(d) Level 2 Assessments

- (i) If any treatment technique for a Level 2 assessment is triggered under 11.16(8)(b), the supplier must ensure that a Level 2 assessment is conducted as soon as practical. The supplier must ensure that the Level 2 assessment, consistent with Department requirements, is completed by the Department or Department-approved party.
- (ii) The supplier must comply with any expedited actions or additional actions required by the Department in the case of an *E. coli* violation.
- (iii) No later than 30 days after learning of a Level 2 treatment technique trigger exceedance, the supplier must submit for review a completed Level 2 assessment form. The supplier must state whether sanitary defects were identified and if so, describe all of the following:
 - (A) Sanitary defects identified.
 - (B) The ~~possible cause~~likely reason(s) for the Level 2 treatment technique trigger.
 - (C) If sanitary defects are identified, corrective actions completed.
 - (D) If sanitary defects are identified, a proposed schedule for any corrective actions not already completed.

(E) The assessment form may also indicate that no sanitary defects were found.

- (iv) If the Department reviews the Level 2 assessment form and determines that the assessment was not sufficient or the assessment form is not complete (including any proposed schedule for any corrective actions not already completed), the Department shall consult with the supplier. If the Department requires revisions after consultation, the supplier must submit a revised assessment form to the Department on an agreed-upon schedule no later than 30 days from the date of the consultation.
- (v) Upon completion and submission of the assessment form by the supplier, the Department shall determine if the supplier identified the ~~possible cause~~likely reason(s) for the Level 2 treatment technique trigger. If the supplier identified the likely reason~~possible~~

cause(s) for the treatment technique trigger, the Department shall determine if the supplier corrected the problem or included a Department-approved schedule for correcting the problem.

11.16(10) Compliance Determination for the *E. coli* MCL

- (a) To determine if an *E. coli* MCL violation has occurred, the supplier must include the results of all routine and repeat samples collected in the monitoring period under 11.16(4) and 11.16(5).
- (b) The BATs for achieving compliance with the *E. coli* MCL are specified in 40 CFR 141.63(e-f).

11.16(11) Violations

- (a) The following constitute *E. coli* MCL violations, pursuant to 11.45(1) and Table 11.45-I:
 - (i) A repeat sample is *E. coli*-positive following a total coliform-positive routine sample.
 - (ii) A repeat sample is total coliform-positive following an *E. coli*-positive routine sample.
 - (iii) The supplier fails to collect all required repeat samples following an *E. coli*-positive routine sample.
 - (iv) The supplier fails to analyze a total coliform-positive repeat sample for *E. coli*.
 - (v) If a repeat sample collected at the monitoring location for triggered source water monitoring is *E. coli*-positive. The supplier must also comply with 11.11(4)(d). If a supplier collects more than one repeat sample at the monitoring location for triggered source water monitoring, the supplier may reduce the number of additional source water samples required under 11.11(4)(d) by the number of repeat samples collected at that location that were not *E. coli*-positive.
 - (vi) If a supplier collects more than one repeat sample at the triggered source water monitoring location under 11.11(4)(d), and more than one repeat sample is *E. coli*-positive, the supplier has violated the *E. coli* MCL and must also comply with 11.11(6).
 - (vii) If all of the repeat samples collected at the triggered source water monitoring location are *E. coli* negative and a repeat sample collected other than the one for triggered source water monitoring is *E. coli*-positive, the supplier has violated the *E. coli* MCL under 11.16(11)(a) and the supplier is not required to comply with 11.11(4)(d).
- (b) The following constitute treatment technique violations:
 - (i) A treatment technique was triggered under 11.16(8) and the supplier failed to conduct the required assessment or corrective action(s) within the timeframe as specified in 11.16(9).
 - (ii) For seasonal systems, the supplier fails to complete Department-approved start-up procedures before supplying water to the public.
- (c) The following constitute monitoring violations:
 - (i) Failure to collect every required routine or additional routine sample in the supplier's compliance period.
 - (ii) Failure to analyze for *E. coli* following a total coliform-positive routine sample.

For all community and non-transient, non-community water systems that supply water treated with chlorine or chloramines, the supplier must comply with the requirements specified in this section, 11.23(1).

(b) MRDL Requirements for Chlorine and Chloramines

(i) The chlorine and chloramines MRDLs are as follows:

TABLE 11.23-I MRDLs FOR CHLORINE AND CHLORAMINES	
Disinfectant	MRDL (mg/L as Cl ₂)
Chlorine	4.0
Chloramines	4.0

(ii) The BATs for achieving compliance with the MRDLs for chlorine and chloramines are specified in 40 CFR 141.65(c).

(iii) To protect public health, the supplier may increase residual disinfectant concentration in the distribution system to a level greater than (>) the MRDL for a time necessary to address specific microbiological contamination problems caused by circumstances including but not limited to:

- (A) Distribution system line breaks.
- (B) Storm run-off events.
- (C) Source water contamination events.
- (D) Backflow contamination events.

(c) Monitoring Requirements for Chlorine and Chloramines

(i) To determine compliance with the MRDLs for chlorine and/or chloramines, the supplier must monitor the residual disinfectant concentration in the distribution system at the same time and at the same locations that total coliform samples are collected under 11.16(4) and 11.16(5), as identified in the supplier's sample siting plan under 11.16(3).

(A) The supplier may use the results of samples collected under 11.8(3)(c)(i)(B) or 11.11(2)(c)(i)(B) to satisfy both the requirements specified in this section, 11.23(1), and 11.8(3)(c)(i)(B) or 11.11(2)(c)(i)(B).

(d) Compliance Determination for Chlorine and Chloramines

(i) Compliance with the MRDL for chlorine or chloramines is determined quarterly based on the RAA of all sample results collected.

(A) If the supplier collects more than one sample in a month, the supplier must average all sample results collected that month to get the monthly average.

(I) The supplier must use the monthly average in the RAA calculation.

(B) If the supplier switches between the use of chlorine and chloramines for disinfection during the year, the supplier must include all sample results for both chlorine and chloramines in calculating the RAA and determining compliance.

Monitoring, and-reporting, and recordkeeping violations, except where a Tier 1 or Tier 2 public notice is required	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Failure to comply with a testing procedure, except where a Tier 1 or Tier 2 public notice is required	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Operation under a variance or an exemption	11.43
Availability of unregulated contaminant monitoring results	11.47
Exceedance of the fluoride secondary maximum contaminant level	11.19(7)
Revised Total Coliform Rule reporting and recordkeeping violations	11.16(11), 11.16(12), and 11.36(4)(d)

(b) For Tier 3 public notice the supplier must:

- (i) Distribute public notice as soon as possible, but no later than one year after learning of the violation or situation or beginning operation under a variance or an exemption.
 - (A) If the supplier is required to distribute more than one Tier 3 public notice, the supplier may use an annual report detailing all violations and situations that occurred during the previous 12 months instead of individual Tier 3 public notices, as long as the timing requirements specified in 11.33(4)(b)(i) are met.
 - (B) For community water systems, the supplier may use the consumer confidence report (CCR) specified in 11.34 to comply with the Tier 3 public notice requirements if the CCR meets all of the following criteria:
 - (I) The CCR is distributed to customers no later than 12 months after the supplier learns of the violation or situation.
 - (II) The Tier 3 public notice in the CCR complies with the content requirements specified in 11.33(5).
 - (III) The CCR is distributed as specified in 11.33(3)(b)(iii).
 - (C) If the supplier posts the public notice, the notice must remain in place for as long as the violation or situation persists or for seven days, whichever is longer.
- (ii) Repeat the distribution of the public notice annually as long as the violation, variance, exemption, or other situation persists.
 - (A) For community water systems, the supplier may use the CCR specified in 11.34 to comply with the repeat Tier 3 public notice requirement if the requirements specified in 11.33(4)(b)(i)(B)(I-III) are met.
- (iii) Distribute the public notice and any repeat public notices as specified in 11.33(3)(b)(iii).

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
<i>Violations of Colorado Primary Drinking Water Regulations²</i>				
Microbiological Contaminants				
Total coliform (TT violations resulting from failure to conduct assessments or corrective actions, and violations resulting from failure to monitor or report)	2	11.16(11)(b)	3	11.16(11)(c-d) 11.16(12)(b)
Seasonal system failure to follow Department-approved start-up procedures before supplying water to the public or failure to submit certification of completed start-up procedures	2	11.16(11)(b)(ii)	3	11.16(11)(d)(iii)
<i>E. coli</i> (MCL violation, monitoring violations, and reporting violations)	1	11.16(11)(a)	3	11.16(11)(c) 11.16(11)(d) 11.16(12)(a) 11.16(12)(c)
<i>E. coli</i> (TT violations resulting from failure to conduct Level 2 assessments or corrective action)	2	11.16(11)(b)(i)	N/A	N/A
Turbidity MCL	2	11.8(2)(d)	3	11.8(2)(c)
Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	2, 1 ³	11.8(2)(d)	3	11.8(2)(c), 11.8(2)(g), 11.46(7)
Surface Water Treatment Rule violations, other than violations resulting from single exceedance of maximum allowable turbidity level (TT)	2	11.8(2)(b)	3	11.8(2)(c), 11.46(7)
Surface Water Treatment Rule: Filter Backwash Recycle Rule	2	11.9(2)	3	11.9(3)
Surface Water Treatment Rule: Enhanced Treatment for <i>Cryptosporidium</i> Rule	2	11.10(3)(c), 11.10(4)(b)	2, 3 ⁴	11.10(2)
Groundwater Rule	2	11.11(2)(d), 11.11(6)(c), 11.11(3)(e)(i), 11.38(4)	3	11.11(2)(c), 11.11(3), 11.11(4), 11.11(5), 11.11(6), 11.38(4)
Disinfectant residual (TT in the distribution system)	2	11.8(3)(d)(i), 11.11(2)(d)(i)	3	11.8(3)(c)(i), 11.11(2)(c)(i)

Disinfectant residual for public water systems that haul water	N/A	N/A	3	11.8(3)(c)(i)(B), 11.11(2)(c)(i)(B), 11.41(2)(b)
Inorganic Chemicals				
Antimony	2	11.19(5)	3	11.19(3)
Arsenic	2	11.19(5)	3	11.19(3)
Asbestos (fibers >10 µm)	2	11.19(5)	3	11.19(3)
Barium	2	11.19(5)	3	11.19(3)
Beryllium	2	11.19(5)	3	11.19(3)
Cadmium	2	11.19(5)	3	11.19(3)
Chromium (total)	2	11.19(5)	3	11.19(3)
Cyanide	2	11.19(5)	3	11.19(3)
Fluoride	2	11.19(5)	3	11.19(3)
Mercury (inorganic)	2	11.19(5)	3	11.19(3)
Nitrate	1	11.18(5)	1 ⁵ , 3	11.18(3)
Nitrite	1	11.18(5)	1 ⁵ , 3	11.18(3)
Total Nitrate and Nitrite	1	11.18(5)	3	11.18(3)
Selenium	2	11.19(5)	3	11.19(3)
Thallium	2	11.19(5)	3	11.19(3)
Lead and Copper Rule				
Lead and Copper Rule (TT)	2	11.26(3)(e), 11.26(4)(k), 11.26(5)(i), 11.26(6)(d), 11.26(7)(f)	3	11.26(2)(d), 11.26(4), 11.26(5)
Synthetic Organic Chemicals (SOCs)				
2,4-D	2	11.21(6)	3	11.21(3)(d)
2,4,5-TP (Silvex)	2	11.21(6)	3	11.21(3)(d)
Alachlor	2	11.21(6)	3	11.21(3)(d)
Atrazine	2	11.21(6)	3	11.21(3)(d)
Benzo(a)pyrene (PAHs)	2	11.21(6)	3	11.21(3)(d)
Carbofuran	2	11.21(6)	3	11.21(3)(d)
Chlordane	2	11.21(6)	3	11.21(3)(d)
Dalapon	2	11.21(6)	3	11.21(3)(d)
Di (2-ethylhexyl) adipate	2	11.21(6)	3	11.21(3)(d)
Di (2-ethylhexyl) phthalate	2	11.21(6)	3	11.21(3)(d)
Dibromochloropropane	2	11.21(6)	3	11.21(3)(d)
Dinoseb	2	11.21(6)	3	11.21(3)(d)
Dioxin (2,3,7,8-TCDD)	2	11.21(6)	3	11.21(3)(d)
Diquat	2	11.21(6)	3	11.21(3)(d)
Endothall	2	11.21(6)	3	11.21(3)(d)

Endrin	2	11.21(6)	3	11.21(3)(d)
Ethylene dibromide	2	11.21(6)	3	11.21(3)(d)
Glyphosate	2	11.21(6)	3	11.21(3)(d)
Heptachlor	2	11.21(6)	3	11.21(3)(d)
Heptachlor epoxide	2	11.21(6)	3	11.21(3)(d)
Hexachlorobenzene	2	11.21(6)	3	11.21(3)(d)
Hexachlorocyclo-pentadiene	2	11.21(6)	3	11.21(3)(d)
Lindane	2	11.21(6)	3	11.21(3)(d)
Methoxychlor	2	11.21(6)	3	11.21(3)(d)
Oxamyl (Vydate)	2	11.21(6)	3	11.21(3)(d)
Pentachlorophenol	2	11.21(6)	3	11.21(3)(d)
Picloram	2	11.21(6)	3	11.21(3)(d)
Polychlorinated biphenyls (PCBs)	2	11.21(6)	3	11.21(3)(d)
Simazine	2	11.21(6)	3	11.21(3)(d)
Toxaphene	2	11.21(6)	3	11.21(3)(d)
Volatile Organic Chemicals (VOCs)				
Benzene	2	11.21(6)	3	11.21(3)(b)
Carbon tetrachloride	2	11.21(6)	3	11.21(3)(b)
Chlorobenzene (monochlorobenzene)	2	11.21(6)	3	11.21(3)(b)
o-Dichlorobenzene	2	11.21(6)	3	11.21(3)(b)
p-Dichlorobenzene	2	11.21(6)	3	11.21(3)(b)
1,2-Dichloroethane	2	11.21(6)	3	11.21(3)(b)
1,1-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
cis-1,2-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
trans-1,2-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
Dichloromethane	2	11.21(6)	3	11.21(3)(b)
1,2-Dichloropropane	2	11.21(6)	3	11.21(3)(b)
Ethylbenzene	2	11.21(6)	3	11.21(3)(b)
Styrene	2	11.21(6)	3	11.21(3)(b)
Tetrachloroethylene	2	11.21(6)	3	11.21(3)(b)
Toluene	2	11.21(6)	3	11.21(3)(b)
1,2,4-Trichlorobenzene	2	11.21(6)	3	11.21(3)(b)
1,1,1-Trichloroethane	2	11.21(6)	3	11.21(3)(b)
1,1,2-Trichloroethane	2	11.21(6)	3	11.21(3)(b)
Trichloroethylene	2	11.21(6)	3	11.21(3)(b)
Vinyl chloride	2	11.21(6)	3	11.21(3)(b)
Xylenes (total)	2	11.21(6)	3	11.21(3)(b)
Radionuclides				

Beta/photon emitters	2	11.22(5)	3	11.22(3)(c)
Alpha emitters	2	11.22(5)	3	11.22(3)(b)
Combined radium (226 & 228)	2	11.22(5)	3	11.22(3)(b)
Uranium	2	11.22(5)	3	11.22(3)(b)
Disinfection Byproducts (DBPs), Disinfection Byproduct Precursors, Disinfectant Residuals				
Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The Department sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).				
Total trihalomethanes (TTHMs)	2	11.25(1)(g)	3	11.25(1)(c)
Haloacetic Acids (HAA5)	2	11.25(1)(g)	3	11.25(1)(c)
Bromate	2	11.25(3)(c)	3	11.25(3)(e)
Chlorite	2	11.25(2)(c)	3	11.25(2)(e)
Chlorine (MRDL)	2	11.23(1)(e)	3	11.23(1)(c)
Chloramine (MRDL)	2	11.23(1)(e)	3	11.23(1)(c)
Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	11.23(2)(e)(ii)	2 ⁶ , 3	11.23(2)(c)
Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	1 ⁷	11.23(2)(e)(i)	1	11.23(2)(c)
Control of DBP precursors—TOC (TT)	2	11.24(9)	3	11.24(3)
Disinfection profiling and benchmarking	2	11.8(4)(d), 11.8(5)(d)	3	11.8(4), 11.8(5)
Development of monitoring plan	N/A	N/A	3	11.25(1)(d)
Other Treatment Techniques				
Acrylamide (TT)	2	11.21(6)(b)	N/A	N/A
Epichlorohydrin (TT)	2	11.21(6)(b)	N/A	N/A
Water hauler failure to operate in accordance with Department-approved operational plan	2	11.41(3)(a)	N/A	N/A
Storage Tanks (TT)	2	11.28(4)(b)	N/A	N/A
Unregulated Contaminant Monitoring⁸				
Unregulated contaminants	N/A	N/A	3	11.47
Nickel	N/A	N/A	3	11.19(3)(b)
Public Notification for Variances and Exemptions				
Operation under a variance or exemption	3	11.43(10)(f) ⁹	N/A	N/A
Violation of conditions of a variance or exemption	2	11.43(10)(f) ¹⁰	N/A	N/A
Other Situations Requiring Public Notification				

Fluoride secondary maximum contaminant level (SMCL) exceedance	3	11.19(7)	N/A	N/A
Exceedance of nitrate MCL for non-community water systems, as allowed by the Department	1	11.18(2)(d)	N/A	N/A
Availability of unregulated contaminant monitoring data	3	11.47	N/A	N/A
Waterborne disease outbreak	1	11.3(81)	N/A	N/A
Other waterborne emergency ¹¹	1	N/A	N/A	N/A
Source Water Sample Positive for GWR Fecal indicators: <i>E. coli</i> , enterococci, or coliphage	1	11.11(4)(d)(i), 11.11(5)(c)(i)	N/A	N/A
Waiver of Disinfection	N/A	N/A	N/A	11.13(2)
Backflow Prevention and Cross Connection Control Rule violations	2	11.39(6)(a)	3	11.39(6)(b)
Other situations as determined by the Department	1, 2, 3 ¹²	N/A	N/A	N/A

1 Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports) do not require notice, unless otherwise determined by the Department. The Department may, at its discretion, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations specified in Table 11.33-V, as authorized under 11.33(2)(a) and 11.33(3)(a).

2 The term "Violations of *Colorado Primary Drinking Water Regulations*" is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

3 Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under 11.8(2)(b) are required to consult with the Department no later than 24 hours after learning of the violation. Based on this consultation, the Department may elevate the violation to Tier 1. If the supplier is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.

4 Failure to collect three or more samples for *Cryptosporidium* analysis requires a special Tier 2 public notice as specified in 11.10(2)(e). All other monitoring and testing procedure violations require Tier 3 public notice.

5 Failure to collect a confirmation sample no later than 24 hours for nitrate or nitrite after an initial sample exceeds the MCL requires Tier 1 public notice. Other monitoring violations for nitrate require Tier 3 public notice.

6 Failure to monitor for chlorine dioxide at the entry point the day after exceeding the MRDL at the entrance to the distribution system requires Tier 2 public notice.

7 If any daily sample collected at the entry point exceeds the MRDL for chlorine dioxide and one or more samples collected in the distribution system the next day exceed the MRDL, Tier 1 public notice is required. Failure to collect the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 public notice.

8 Some water systems must monitor for certain unregulated contaminants under 11.47.

9 This citation refers to §§1415 and 1416 of the Safe Drinking Water Act. §§1415 and 1416 require that "a schedule prescribed . . . for a public water system granted a variance shall require compliance by the system . . ."

10 In addition to §§1415 and 1416 of the Safe Drinking Water Act, 11.43(3) of the *Colorado Primary Drinking Water Regulations* specifies the items and schedule milestones that must be included in a variance for small systems.

11 Other waterborne emergencies require a Tier 1 public notice under 33.2(a) for situations that do not meet the definition of a waterborne disease outbreak specified in 11.3, but that

still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

12 The Department may place other situations in any tier believed appropriate, based on threat to public health.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
<i>Colorado Primary Drinking Water Regulations</i>			
Microbiological Contaminants			
Fecal coliform/<i>E. coli</i>	Zero	Zero	Fecal coliforms and <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Fecal indicators (GWR)	Zero	TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
<i>E. coli</i> (GWR)	None	TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
<u>1. <i>E. coli</i></u> <u>2. Enterococci</u> <u>4-3-Coliphage</u> (GWR)	None	TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Coliphage (GWR)	-	-	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Groundwater Rule (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

A violation that occurred for failure to conduct an assessment not triggered by the presence of <i>E. coli</i> and/or violations for corrective action		TT	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. [THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment(s).
A violation that occurred for failure to conduct an assessment triggered by the presence of <i>E. coli</i> and/or violations for corrective action		TT	<i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for <i>E. coli</i> , indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found. [THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment that we conducted.
<i>E. coli</i> MCL violations	Zero	See footnote 2	<i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.
A violation occurred for failure to conduct seasonal start-up procedures	None	TT	Failure to perform the required start-up procedures prior to serving water to the public has the potential to distribute contaminated water. When our system shuts down operation, the lack of pressure in our pipes can allow the entry of bacteria and other disease-causing microorganisms into the drinking water. By performing start-up procedures such as flushing the pipes, disinfecting the water, and collecting a coliform bacteria sample before we open, we can be sure that we are providing you with safe water.
Turbidity	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Disinfectant residual	N/A	TT (in the distribution system)	Disinfectant residual serves as one of the final barriers to protect public health. Lack of an adequate disinfectant residual may increase the likelihood that disease-causing organisms are present.
Surface Water Treatment Rule, Surface Water Treatment Rule: Filter Backwash Recycle Rule, and Surface Water Treatment Rule: Enhanced Treatment for Cryptosporidium Rule violations			
<i>Giardia lamblia</i>	Zero	TT ³	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Viruses	.	.	.
Heterotrophic plate count (HPC) bacteria ⁴	.	.	.
<i>Legionella</i>	.	.	.
<i>Cryptosporidium</i>	.	.	.
Inorganic Chemicals			
Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
Arsenic	0	0.010	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos (10 µm)	7 MFL	7 MFL	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Total Nitrate and Nitrite	10	10	Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Lead and Copper			
Lead	Zero	TT ⁵	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Copper	1.3	TT ⁶	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Synthetic Organic Chemicals (SOCs)			
2,4-D	0.07	0.07	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene (PAHs)	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.

Carbofuran	0.04	0.04	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane	Zero	0.002	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di (2-ethylhexyl) adipate	0.4	0.4	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.
Di (2-ethylhexyl) phthalate	Zero	0.006	Some people who drink water containing di (2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloro-propane (DBCP)	Zero	0.0002	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Dioxin (2,3,7,8-TCDD)	Zero	3×10^{-8}	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Ethylene dibromide	Zero	0.00005	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachlorocyclopentadiene	0.05	0.05	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Polychlorinated biphenyls (PCBs)	Zero	0.0005	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile Organic Chemicals (VOCs)			
Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (monochloro- benzene)	0.1	0.1	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene	0.6	0.6	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.

p-Dichlorobenzene	0.075	0.075	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane	Zero	0.005	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,1-Dichloroethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene	0.1	0.1	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-Dichloropropane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloroethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
Toluene	1	1	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
1,2,4-Trichlorobenzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
1,1,2-Trichloroethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
Radionuclides			

Beta/photon emitters	Zero	4 mrem/yr	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters	Zero	15 pCi/L	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium	Zero	30µg/L	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Disinfection Byproducts (DBPs), Disinfection Byproduct Precursors, Disinfectant Residuals			
Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The Department sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs). ¹⁸			
Total trihalomethanes (TTHMs)	N/A	0.080 ⁷	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
Haloacetic Acids (HAA)	N/A	0.060 ⁸	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chlorine	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Chloramines	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.

Chlorine dioxide, where any 2 consecutive daily samples collected at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system, which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today include exceedances of the State standard within the distribution system, which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Other Treatment Techniques			
Acrylamide	Zero	TT	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

Backflow Prevention and Cross-Connection Control Rule	None	TT	<p>Uncontrolled cross connections can lead to inadvertent contamination of the drinking water.</p> <p>[THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.]</p> <p>We have installed or permitted an uncontrolled cross connection.</p> <p>We failed to notify the Department of a backflow contamination event.</p> <p>We failed to complete the testing requirements for backflow prevention devices.</p> <p>We failed to comply with the requirements for surveying our system for cross connections.</p>
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1 If the supplier is collecting at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. If the supplier is collecting fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

2 *E. coli*-positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an *E. coli*-positive routine sample, failure to collect all required repeat samples following an *E. coli*-positive routine sample, or failure to analyze a total-coliform positive repeat sample for *E. coli*.

3 11.8 treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.

4 The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfection in the distribution system.

5 Action Level = 0.015 mg/L

6 Action Level = 1.3 mg/L

7 The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.

8 The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.

(G) *Level 2 assessment* means a very detailed study of the water system to identify possible problems and determine, if possible, why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

(iv) The supplier must include in the CCR the telephone number for the system that the consumer may call for additional information about the CCR.

(v) The supplier must include in the CCR information about opportunities for public participation in decisions that may affect the quality of the water (e.g., time and place of regularly scheduled board meetings).

(vi) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, the supplier must include either of the following in the CCR:

(A) Information in the appropriate language(s) regarding the importance of the CCR.

(B) A telephone number or address where the consumer may contact the supplier to obtain a translated copy of the CCR or request assistance in the appropriate language.

(vii) For each violation that occurs during the year covered by the CCR specified in 11.34(2)(d)(vi), the supplier must include a clear and readily understandable explanation of each violation, any potential adverse health effects, and the steps the supplier has taken to correct the violation.

(b) Language Requirements for the CCR

(i) The supplier must include all of the following language in the CCR, exactly as written:

(A) "Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791)."

(B) "Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)."

(ii) The supplier must also include in the CCR a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water including bottled water.

(A) The supplier may use the following language or comparable language:

(I) "The sources of drinking water include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and,

in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and also may come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health."

- (iii) The supplier must include in the CCR a short informational statement about lead in drinking water and its effects on children.
 - (A) The supplier may use the following language, providing the specific information for the text in brackets, or other Department-approved language written by the supplier:
 - (I) If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF WATER SYSTEM] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://water.epa.gov/drink/info/lead>.

(c) Source Water Content Requirements for the CCR

- (i) The supplier must include all of the following information about each of the system's sources in the CCR:
 - (A) The type of source (e.g., surface water or groundwater).
 - (B) The commonly used name(s) of the source(s), if any.
 - (C) The general location(s) of the source(s).
 - (D) If a source water assessment has been completed, the supplier must include all of the following:
 - (I) Notification of the availability of this information.
 - (II) How to obtain this information.
 - (III) If the Department has provided a source water assessment, a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the Department or written by the supplier.

(d) Detected Contaminant Content Requirements for the CCR

- (i) The supplier must include in the CCR information on all of the following detected contaminants, except *Cryptosporidium*:
 - (A) Regulated contaminants.
 - (B) Unregulated contaminants that the supplier must sample for under 11.47.
- (ii) The information for detected contaminants must be displayed in a table or several adjacent tables.
 - (A) If the supplier chooses to include information related to any additional sample results not required by 11.34(2)(d)(i), the supplier must display this information separately from the table(s) of detected contaminants.
- (iii) For each regulated contaminant, the table(s) of detected contaminants must include all of the following:
 - (A) The MCL expressed as a whole number as specified in Table 11.34-I.
 - (I) If there is no MCL for a detected contaminant, the supplier must show in the table(s) that there is a treatment technique, or specify the action level, applicable to that contaminant.
 - (B) The MCLG expressed in the same units as the MCL.
 - (C) For contaminants subject to an MCL, except turbidity, total coliforms and *E. coli*, the highest contaminant level used to determine compliance and the range of detected levels as follows:
 - (I) If compliance with the MCL is determined annually or less frequently, the highest detected level and the range of all detected levels expressed in the same units as the MCL.

- (II) If compliance with the MCL is determined based on a RAA, the RAA and range of all detected sample results expressed in the same units as the MCL.
- (III) If compliance with the MCL is determined based on an LRAA, the highest LRAA and the range of all LRAAs expressed in the same units as the MCL.
 - (a) For the TTHM and HAA5 MCLs, the supplier must also include the range of all individual sample results expressed in the same units as the MCL.
 - (b) For the TTHM and HAA5 MCLs, if more than one LRAA exceeds the MCL, the supplier must include the LRAAs for all sampling locations that exceeded the MCL.
- (D) For turbidity reported under 11.8, the highest single turbidity measurement and the lowest monthly percentage of samples meeting the turbidity limit specified in 11.8 for the filtration technology being used.
 - (I) The supplier should include an explanation of the reasons for measuring turbidity.
- (E) For lead and copper, the 90th percentile value(s) and the number of sampling sites that exceeded the action levels.
- (F) For *E. coli*, the total number of *E. coli*-positive samples that are not special purpose samples, collected under 11.16(4) or 11.16(5).
- (iv) For each unregulated contaminant for which the supplier must monitor, the table(s) of detected contaminants must include the average of the sample results and the range of all detected levels.
 - (A) The supplier may include a brief explanation of the reasons for monitoring for unregulated contaminants.
- (v) The table(s) of detected contaminants must also include the likely source(s) of the contaminants to the best of the supplier's knowledge.
 - (A) If the supplier lacks specific information on the likely source, the supplier must include one or more of the typical sources for that contaminant listed in Table 11.34-I that is most applicable to the system.
- (vi) The table(s) of detected contaminants must clearly identify any data that show a violation of any of the requirements listed below that occurred during the year covered by the CCR:
 - (A) MCLs.
 - (B) MRDLs.
 - (C) Treatment techniques.
 - (D) Monitoring and reporting of compliance data.

- (E) Filtration and disinfection as specified in 11.8.
- (F) Recordkeeping of compliance data.
- (G) Special monitoring requirements as specified in 11.47 and 11.20.
- (H) If applicable, the terms of a variance, an exemption, or an administrative or judicial order.

(vii) If a system supplies water through multiple hydraulically independent distribution systems that use different sources, the supplier should identify each separate distribution system in the CCR and should include a separate column for each independent distribution system in the table(s) of detected contaminants.

- (A) Alternatively, the supplier may produce separate CCRs that only include data for each independent distribution system.

(e) Additional Content Requirements for the CCR

(i) If the supplier is required to comply with 11.11:

(A) The supplier must include all of the following information in the CCR about any significant deficiency that has not been corrected at the time of delivery of the CCR:

- (I) The nature of the significant deficiency(s).
- (II) The date(s) the significant deficiency(s) was identified by the Department.
- (III) For each significant deficiency that was required to be addressed under 11.38(3) that has not been addressed, the Department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.

(B) The supplier must continue to include the information under 11.34(2)(e)(i)(A) each year until the Department determines that the significant deficiency was corrected under 11.38(3).

(C) If directed by the Department, the supplier must include all of the following information for any significant deficiency that was corrected before the CCR is issued:

- (I) Inform the customers of the significant deficiency.
- (II) How the deficiency was corrected.
- (III) The date of correction.

(D) The supplier must include all of the following information in the CCR about any fecal indicator-positive groundwater source sample:

- (I) The source of the fecal contamination, if the source is known.
- (II) The date(s) of the fecal indicator-positive groundwater source sample(s).

- (III) For each fecal indicator-positive contamination event in the groundwater source that was required to be addressed under 11.11(6)(b) that has not been addressed, the Department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.
 - (IV) If the fecal contamination in the groundwater source was addressed under 11.11(6), the date of such action.
 - (V) The applicable potential health effects language specified in Table 11.34-1 for a fecal indicator-positive groundwater source sample(s) that was not invalidated by the Department.
- (E) The supplier must continue to include the information specified in 11.34(2)(e)(i)(D) each year until the Department determines that the fecal contamination in the groundwater source was addressed under 11.11(6)(b).
- (ii) If the supplier has nitrate sample result(s) greater than (>) 5 mg/L but less than (<) the MCL, the supplier must include a short informational statement about nitrate's effect on children.
- (A) The supplier may use the following language or other Department-approved language written by the supplier:
 - (I) "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider."
- (iii) If the supplier has arsenic sample result(s) greater than (>) 0.005 mg/L but less than or equal to (\leq) 0.010 mg/L, the supplier must include a short informational statement about arsenic.
- (A) The supplier may use the following language or other Department-approved language written by the supplier:
 - (I) "While your drinking water meets the EPA's standard for arsenic, it does contain low levels of arsenic. The EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."
- (iv) If the supplier sampled for *Cryptosporidium* and the sample results show that *Cryptosporidium* may be present in the source water or the finished water, the supplier must include all of the following:
- (A) A summary of the sample results.
 - (B) An explanation of the significance of the sample results.

- (v) If the supplier sampled for radon and the sample results show that radon may be present in the finished water, the supplier must include all of the following:
 - (A) The sample results.
 - (B) An explanation of the significance of the sample results.
- (vi) If a supplier is operating under a variance or an exemption as specified in 11.43, the supplier must include all of the following:
 - (A) An explanation of the reasons for the variance or exemption.
 - (B) The date on which the variance or exemption was issued.
 - (C) A brief status report on the steps the supplier is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption.
 - (D) A notice of any opportunity for public input in the review or renewal, of the variance or exemption.
- (vii) For surface water systems, if the supplier failed to install adequate filtration or disinfection equipment or processes, or has had a failure of such equipment or processes which are a violation as specified in 11.8, the supplier must include the following language exactly as written as part of the explanation of potential adverse health effects:
 - (A) "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."
- (viii) If the supplier failed to take one or more actions for lead and copper control as specified in 11.26, the supplier must include the applicable language from Table 11.34-I.
- (ix) If the supplier failed to comply with the acrylamide and epichlorohydrin certification requirements as specified in 11.21(5), the supplier must include the applicable language from Table 11.34-I.
- (x) The supplier must include a clear and readily understandable explanation of any violation specified in 11.34(2)(d)(vi), including the length of the violation, any potential adverse health effects, and the actions the supplier has taken to correct the violation.
 - (A) To describe the potential adverse health effects, the supplier must include the applicable language from Table 11.34-I.
- (xi) If the supplier has collected additional voluntary samples and the sample results show the presence of other contaminants in the finished water, the Department strongly encourages the supplier to report any sample results which may show a health concern.
 - (A) To determine if results may show a health concern, the Department recommends that the supplier find out if EPA has proposed a National Primary Drinking Water Regulation or has issued a health advisory for that contaminant by calling the Safe Drinking Water Hotline (800-426-4791).

- (B) Detects above a proposed MCL or health advisory level show possible health concerns. For such contaminants, the Department recommends that the supplier include all of the following:
 - (I) The sample results.
 - (II) An explanation of the significance of the sample results noting the existence of a health advisory or a proposed regulation.
- (xii) If a backflow prevention and cross-connection control violation occurs under 11.39(6), the supplier must include the following.
 - (A) The following language exactly as written:
 - (I) "We have an inadequate backflow prevention and cross-connection control program. Uncontrolled cross connections can lead to inadvertent contamination of the drinking water."
 - (B) If applicable, one or both of the following statements:
 - (I) We have installed or permitted an uncontrolled cross connection.
 - (II) We experienced a backflow contamination event.
- (xiii) If the supplier is required to conduct a Level 1 assessment and/or a Level 2 assessment that is not triggered by an *E. coli* MCL violation, the supplier must include the following:
 - (A) The following language exactly as written:
 - (I) "Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments."
 - (B) The following applicable language for a Level 1 assessment and/or a Level 2 assessment exactly as written, providing the specific information for the text in brackets:
 - (I) During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.
 - (II) During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and

- (a) No later than July 1 of each calendar year, the supplier must submit a copy of the CCR along with a Certification of Delivery to the Department.
 - (i) The Certification of Delivery must state that the CCR has been distributed to customers and that the information is correct and consistent with the information that the supplier previously submitted to the Department.
 - (ii) The supplier must also distribute the CCR to any other agency or clearinghouse as directed to by the Department.
- (b) For wholesale systems, the wholesaler must submit a copy of the information provided to the supplier responsible for the consecutive system along with a Certification of Delivery to the Department no later than the date specified in 11.34(3)(a)(i).
 - (i) The Certification of Delivery must state that the information has been distributed to the supplier responsible for the consecutive system(s) and that the information is correct and consistent with the information that the wholesaler previously submitted to the Department.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS

Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbiological Contaminants						
Total coliform bacteria	TT	N/A	TT	N/A	Naturally present in the environment	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution.
Fecal Indicators: <u>1</u> including <i>E. coli</i> , <u>2</u> enterococci or <u>3</u> coliphage	TT	N/A	TT	N/A	Human and animal fecal waste	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

Fecal coliform and <i>E. coli</i>	0	N/A	0	0	Human and animal fecal waste.	Fecal coliforms and <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
<i>E. coli</i>	<i>E. coli</i> -positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an <i>E. coli</i> -positive routine sample, failure to collect all required repeat samples following an <i>E. coli</i> -positive routine sample, or failure to analyze a total-coliform positive repeat sample for <i>E. coli</i> .	N/A	<i>E. coli</i> -positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an <i>E. coli</i> -positive routine sample, failure to collect all required repeat samples following an <i>E. coli</i> -positive routine sample, or failure to analyze a total-coliform positive repeat sample for <i>E. coli</i> .	0	Human and animal fecal waste	<i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely-compromised immune systems.

Total organic carbon (ppm)	TT	N/A	TT	N/A	Naturally present in the environment.	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (TTHMs) and haloacetic acids (HAA5s). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	TT	N/A	TT	N/A	Soil runoff.	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Disinfectant residual ²	TT (in the distribution system)	N/A	TT (in the distribution system)	N/A	Water additive used to control microbes.	Disinfectant residual serves as one of the final barriers to protect public health. Lack of an adequate disinfectant residual may increase the likelihood that disease-causing organisms are present.
Radionuclides						
Beta/photon emitters (mrem/yr)	4 mrem/yr	N/A	4	0	Decay of natural and man-made deposits.	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.

Alpha emitters (pCi/L)	15 pCi/L	N/A	15	0	Erosion of natural deposits.	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (pCi/L)	5 pCi/L	N/A	5	0	Erosion of natural deposits.	Some people who drink water containing radium -226 or -228 in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium (µg/L)	30 µg/L	N/A	30	0	Erosion of natural deposits.	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Inorganic Chemicals						
Antimony (ppb)	0.006	1000	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
Arsenic (ppb)	0.010	1000	10 ⁴	0 ⁴	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos (MFL)	7 MFL	N/A	7	7	Decay of asbestos cement water mains; Erosion of natural deposits.	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.

Barium (ppm)	2	N/A	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	0.004	1000	4	4	Discharge from metal refineries and coal burning factories; Discharge from electrical, aerospace, and defense industries.	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Bromate (ppb)	0.010	1000	10	0	By-product of drinking water disinfection.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium (ppb)	0.005	1000	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints.	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chloramines (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

Chlorine dioxide (ppb)	MRDL = 0.8	1000	MRDL = 800	MRDLG = 800	Water additive used to control microbes.	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chlorite (ppm)	1	N/A	1	0.8	By-product of drinking water disinfection.	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chromium (ppb)	0.1	1000	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper (ppm)	AL=1.3	N/A	AL=1.3	1.3	Corrosion of household plumbing systems; Erosion of natural deposits.	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Cyanide (ppb)	0.2	1000	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

Fluoride (ppm)	4.0	N/A	4.0	4.0	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Lead (ppb)	AL=0.015	1000	AL=15	0	Corrosion of household plumbing systems; Erosion of natural deposits.	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury (inorganic) (ppb)	0.002	1000	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (ppm)	10	N/A	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Nitrite (ppm)	1	N/A	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium (ppb)	0.05	1000	50	50	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium (ppb)	0.002	1000	2	0.5	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Synthetic Organic Chemicals (SOCs)						
2,4-D (ppb)	0.07	1000	70	70	Runoff from herbicide used on row crops.	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP (Silvex)(ppb)	0.05	1000	50	50	Residue of banned herbicide.	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	N/A	N/A	TT	0	Added to water during sewage/wastewater treatment.	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.

Alachlor (ppb)	0.002	1000	2	0	Runoff from herbicide used on row crops.	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine (ppb)	0.003	1000	3	3	Runoff from herbicide used on row crops.	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene (PAH) (nanograms/L)	0.0002	1,000,000	200	0	Leaching from linings of water storage tanks and distribution lines.	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran (ppb)	0.04	1000	40	40	Leaching of soil fumigant used on rice and alfalfa.	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane (ppb)	0.002	1000	2	0	Residue of banned termiticide.	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon (ppb)	0.2	1000	200	200	Runoff from herbicide used on rights of way.	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

Di(2-ethylhexyl) adipate (ppb)	0.4	1000	400	400	Discharge from chemical factories.	Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects, such as weight loss, liver enlargement or possible reproductive difficulties.
Di(2-ethylhexyl) phthalate (ppb)	0.006	1000	6	0	Discharge from rubber and chemical factories.	Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloro-propane (ppt)	0.0002	1,000,000	200	0	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb (ppb)	0.007	1000	7	7	Runoff from herbicide used on soybeans and vegetables.	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat (ppb)	0.02	1000	20	20	Runoff from herbicide use.	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin (2,3,7,8-TCDD) (ppq)	0.00000003	1,000,000,000	30	0	Emissions from waste incineration and other combustion; discharge from chemical factories.	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Endothall (ppb)	0.1	1000	100	100	Runoff from herbicide use	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

Endrin (ppb)	0.002	1000	2	2	Residue of banned insecticide	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Epichlorohydrin	TT	N/A	TT	0	Discharge from industrial chemical factories; an impurity of some water treatment chemicals.	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide (ppt)	0.00005	1,000,000	50	0	Discharge from petroleum refineries.	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate (ppb)	0.7	1000	700	700	Runoff from herbicide use.	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor (ppt)	0.0004	1,000,000	400	0	Residue of banned pesticide.	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide (ppt)	0.0002	1,000,000	200	0	Breakdown of heptachlor.	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

Hexachlorobenzene (ppb)	0.001	1000	1	0	Discharge from metal refineries and agricultural chemical factories.	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachloro-cyclopentadiene (ppb)	0.05	1000	50	50	Discharge from chemical factories.	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane (ppt)	0.0002	1,000,000	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor (ppb)	0.04	1000	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl (Vydate) (ppb)	0.2	1000	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
PCBs (Polychlorinated biphenyls) (ppt)	0.0005	1,000,000	500	0	Runoff from landfills; discharge of waste chemicals.	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.

Pentachloro-phenol (ppb)	0.001	1000	1	0	Discharge from wood preserving factories.	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram (ppb)	0.5	1000	500	500	Herbicide runoff.	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Simazine (ppb)	0.004	1000	4	4	Herbicide runoff.	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene (ppb)	0.003	1000	3	0	Runoff/leaching from insecticide used on cotton and cattle.	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile Organic Chemicals (VOCs)						
Benzene (ppb)	0.005	1000	5	0	Discharge from factories; leaching from gas storage tanks and landfills.	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride (ppb)	0.005	1000	5	0	Discharge from chemical plants and other industrial activities.	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (ppb)	0.1	1000	100	100	Discharge from chemical and agricultural chemical factories.	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.

o-Dichlorobenzene (ppb)	0.6	1000	600	600	Discharge from industrial chemical factories.	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
p-Dichlorobenzene (ppb)	0.075	1000	75	75	Discharge from industrial chemical factories.	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane (ppb)	0.005	1000	5	0	Discharge from Industrial chemical factories.	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
1,1-Dichloroethylene (ppb)	0.007	1000	7	7	Discharge from industrial chemical factories.	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene (ppb)	0.07	1000	70	70	Discharge from industrial chemical factories.	Some people who drink water containing cis-1,2- dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene (ppb)	0.1	1000	100	100	Discharge from industrial chemical factories.	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane (ppb)	0.005	1000	5	0	Discharge from pharmaceutical and chemical factories.	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

1,2-Dichloropropane (ppb)	0.005	1000	5	0	Discharge from industrial chemical factories.	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene (ppb)	0.7	1000	700	700	Discharge from petroleum refineries.	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (HAA) (ppb)	0.060	1000	60	N/A	By-product of drinking water disinfection.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene (ppb)	0.1	1000	100	100	Discharge from rubber and plastic factories; leaching from landfills.	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloro-ethylene (ppb)	0.005	1000	5	0	Discharge from factories and dry cleaners.	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
1,2,4-Trichloro-benzene (ppb)	0.07	1000	70	70	Discharge from textile-finishing factories.	Some people who drink water containing 1,2,4- trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane (ppb)	0.2	1000	200	200	Discharge from metal degreasing sites and other factories.	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.

1,1,2-Trichloroethane (ppb)	0.005	1000	5	3	Discharge from industrial chemical factories.	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
Trichloro-ethylene (ppb)	0.005	1000	5	0	Discharge from metal degreasing sites and other factories.	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
TTHMs (Total trihalomethanes) (ppb)	0.080	1000	80	N/A	Byproduct of drinking water disinfection.	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Toluene (ppm)	1	N/A	1	1	Discharge from petroleum factories.	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
Vinyl Chloride (ppb)	0.002	1000	2	0	Leaching from PVC piping; discharge from plastics factories.	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (ppm)	10	N/A	10	10	Discharge from petroleum factories; discharge from chemical factories.	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

- (iii) The EPA Administrator has identified a small system variance technology that is applicable to the system's size and source water quality.
 - (A) The supplier must be financially and technically capable of installing, operating, and maintaining the applicable small system variance technology, as specified in guidance or regulations issued by the EPA Administrator.
 - (iv) The Department determines that the small system variance technology provides adequate protection of public health, considering the system's source water quality and the removal efficiencies and expected useful life of the small system variance technology.
- (b) The Department will not grant a small system variance from:
- (i) Treatment technique requirements or MCLs for a contaminant which was regulated in the *National Primary Drinking Water Regulations* on or before January 1, 1986.
 - (ii) A microbial contaminant (e.g., a bacterium, virus or other organism), an indicator for a microbial contaminant, or treatment technique requirement for a microbial contaminant.
 - (iii) A treatment technique for filtration of surface water sources specified in 11.8, 11.9, ~~or 11.10~~ or a treatment technique requirement in 11.11 or 11.16.

11.43(4) Exemption Qualifications

- (a) The Department may grant an exemption from an MCL or treatment technique if all of the following criteria apply:
- (i) Due to compelling factors, the supplier is unable to comply with an MCL or treatment technique requirement, or implement measures to develop an alternative source.
 - (A) Compelling factors may include economic factors (e.g., qualifying as a system that supplies a disadvantaged community).
 - (ii) The exemption will not result in an unreasonable risk to public health.
 - (iii) The supplier cannot reasonably make management and/or restructuring changes that result in compliance or, if compliance cannot be achieved, improve the drinking water quality.
 - (iv) The public water system was in operation on the effective date of the MCL or treatment technique requirement.
 - (A) The Department may grant an exemption to systems not in operation on the effective date of the MCL or treatment technique requirement if a reasonable alternative source is not available.
- (b) If the supplier was granted a variance or small system variance, the supplier will not be granted an exemption.
- (c) The supplier will not be granted an exemption from:
- ~~(i) The total coliform MCL.~~
 - ~~(A) The effective date relating to the total coliform MCL has been stayed for a supplier that demonstrates to the Department that the violation of the total~~

In order to address EPA's comments and for the department to obtain full primacy for the RTCR, the commission modified the drinking water regulation to increase clarity and accuracy in accordance with EPA's concerns. The modifications were minor and do not change any underlying requirements.

Revisions included:

- Adding cross-references to the RTCR and Ground Water Rule (Sections 11.11. and 11.16).
- Improving definitions related to RTCR (e.g., triggered assessments and seasonal systems) in Section 11.3.
- Adding clarifying language to RTCR (Section 11.16).
- Clarifying RTCR-related requirements in the Surface Water Treatment Rule (Section 11.8)
- Adding clarifying language, consolidating health effects language for public notification, and adding "recordkeeping" to the Tier 3 public notice table in Section 11.33 (Public Notification Rule).
- Adding RTCR-related clarifying language, adding cross-references, and consolidating the table of regulated contaminants in Section 11.34 (Consumer Confidence Report (CCR) Rule).
- Adding RTCR-related clarifying language and cross-references to Section 11.43 (Variances and Exemptions Rule).
- Correcting the RTCR table of contents for formatting issues.
- Adding a RTCR and GWR-related reference column to the MCLs and MCLGs microbial table in Section 11.45 (MCLs, MCLGs, SMCLs, MRDLs, and Action Levels).

One additional correction was made to Section 11.39 for the Backflow Prevention and Cross-Connection Rule. A minor modification was made to correct a typographical error in reference 11.39(1).