

reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer.

(4) Ground water systems that provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in § 141.403(b).

(5) If requested by the State, ground water systems must provide the State with any existing information that will enable the State to perform a hydrogeologic sensitivity assessment. For the purposes of this subpart, "hydrogeologic sensitivity assessment" is a determination of whether ground water systems obtain water from hydrogeologically sensitive settings.

(d) *Compliance date.* Ground water systems must comply, unless otherwise noted, with the requirements of this subpart beginning December 1, 2009.

**§ 141.401 Sanitary surveys for ground water systems.**

(a) Ground water systems must provide the State, at the State's request, any existing information that will enable the State to conduct a sanitary survey.

(b) For the purposes of this subpart, a "sanitary survey," as conducted by the State, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available, facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

(c) The sanitary survey must include an evaluation of the applicable components listed in paragraph (c)(1) through (8) of this section:

- (1) Source,
- (2) Treatment,
- (3) Distribution system,
- (4) Finished water storage,

(5) Pumps, pump facilities, and controls,

(6) Monitoring, reporting, and data verification,

(7) System management and operation, and

(8) Operator compliance with State requirements.

**§ 141.402 Ground water source microbial monitoring and analytical methods.**

(a) *Triggered source water monitoring—*

(1) *General requirements.* A ground water system must conduct triggered source water monitoring if the conditions identified in paragraphs (a)(1)(i) and either (a)(1)(ii) or (a)(1)(iii) of this section exist.

(i) The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a State-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source; and either

(ii) The system is notified that a sample collected under § 141.21(a) is total coliform-positive and the sample is not invalidated under § 141.21(c) until March 31, 2016, or

(iii) The system is notified that a sample collected under §§ 141.854 through 141.857 is total coliform-positive and the sample is not invalidated under § 141.853(c) beginning April 1, 2016.

(2) *Sampling requirements.* A ground water system must collect, within 24 hours of notification of the total coliform-positive sample, at least one ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under § 141.21(a) until March 31, 2016, or collected under §§ 141.854 through 141.857 beginning April 1, 2016, except as provided in paragraph (a)(2)(ii) of this section.

(i) The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.

(ii) If approved by the State, systems with more than one ground water

source may meet the requirements of this paragraph (a)(2) by sampling a representative ground water source or sources. If directed by the State, systems must submit for State approval a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under §141.21(a) until March 31, 2016, or under §141.853 beginning April 1, 2016, and that the system intends to use for representative sampling under this paragraph.

(iii) Until March 31, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of §141.21(b) and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a). If the repeat sample collected from the ground water source is *E. coli*-positive, the system must comply with paragraph (a)(3) of this section.

(iv) Beginning April 1, 2016, a ground water system serving 1,000 or fewer people may use a repeat sample collected from a ground water source to meet both the requirements of subpart Y and to satisfy the monitoring requirements of paragraph (a)(2) of this section for that ground water source only if the State approves the use of *E. coli* as a fecal indicator for source water monitoring under this paragraph (a) and approves the use of a single sample for meeting both the triggered source water monitoring requirements in this paragraph (a) and the repeat monitoring requirements in §141.858. If the repeat sample collected from the ground water source is *E. coli*-positive, the system must comply with paragraph (a)(3) of this section.

(3) *Additional requirements.* If the State does not require corrective action under §141.403(a)(2) for a fecal indicator-positive source water sample collected under paragraph (a)(2) of this section that is not invalidated under paragraph (d) of this section, the system must collect five additional source water samples from the same source

within 24 hours of being notified of the fecal indicator-positive sample.

(4) *Consecutive and wholesale systems.*

(i) In addition to the other requirements of this paragraph (a), a consecutive ground water system that has a total coliform-positive sample collected under §141.21(a) until March 31, 2016, or under §§141.854 through 141.857 beginning April 1, 2016, must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

(ii) In addition to the other requirements of this paragraph (a), a wholesale ground water system must comply with paragraphs (a)(4)(ii)(A) and (a)(4)(ii)(B) of this section.

(A) A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under §141.21(a) until March 31, 2016, or collected under §§141.854 through 141.857 beginning April 1, 2016, is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under paragraph (a)(2) of this section and analyze it for a fecal indicator under paragraph (c) of this section.

(B) If the sample collected under paragraph (a)(4)(ii)(A) of this section is fecal indicator-positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of paragraph (a)(3) of this section.

(5) *Exceptions to the triggered source water monitoring requirements.* A ground water system is not required to comply with the source water monitoring requirements of paragraph (a) of this section if either of the following conditions exists:

(i) The State determines, and documents in writing, that the total coliform-positive sample collected under §141.21(a) until March 31, 2016, or under §§141.854 through 141.857 beginning April 1, 2016, is caused by a distribution system deficiency; or

(ii) The total coliform-positive sample collected under §141.21(a) until March 31, 2016, or under §§141.854 through 141.857 beginning April 1, 2016,

is collected at a location that meets State criteria for distribution system conditions that will cause total coliform-positive samples.

(b) *Assessment source water monitoring.* If directed by the State, ground water systems must conduct assessment source water monitoring that meets State-determined requirements for such monitoring. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under paragraph (a)(2) of this section to meet the requirements of paragraph (b) of this section. State-determined assessment source water monitoring requirements may include:

(1) Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public,

(2) Collection of samples from each well unless the system obtains written State approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

(3) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

(4) Analysis of all ground water source samples using one of the analytical methods listed in the in paragraph (c)(2) of this section for the presence of *E. coli*, enterococci, or coliphage.

(5) Collection of ground water source samples at a location prior to any treatment of the ground water source unless the State approves a sampling location after treatment, and

(6) Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the State approves an alternate sampling location that is representative of the water quality of that well.

(c) *Analytical methods.* (1) A ground water system subject to the source water monitoring requirements of paragraph (a) of this section must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

(2) A ground water system must analyze all ground water source samples collected under paragraph (a) of this section using one of the analytical methods listed in the following table in paragraph (c)(2) of this section or one of the alternative methods listed in appendix A to subpart C of this part for the presence of *E. coli*, enterococci, or coliphage:

ANALYTICAL METHODS FOR SOURCE WATER MONITORING

Fecal indicator <sup>1</sup>	Methodology	Method citation
<i>E. coli</i> .....	Colilert <sup>3</sup> .....	9223 B. <sup>2</sup>
	Colisure <sup>3</sup> .....	9223 B. <sup>2</sup>
	Membrane Filter Method with M1 Agar .....	EPA Method 1604. <sup>4</sup>
	m-ColiBlue24 Test <sup>5</sup> .....	
	E*Colite Test <sup>6</sup> .....	
Enterococci	EC-MUG <sup>7</sup> .....	9221 F. <sup>2</sup>
	NA-MUG <sup>7</sup> .....	9222 G. <sup>2</sup>
	Multiple-Tube Technique .....	9230B. <sup>2</sup>
	Membrane Filter Technique .....	9230C. <sup>2</sup>
Coliphage .....	Membrane Filter Technique .....	EPA Method 1600. <sup>8</sup>
	Enterolert <sup>9</sup> .....	
	Two-Step Enrichment Presence-Absence Procedure .....	EPA Method 1601. <sup>10</sup>
	Single Agar Layer Procedure .....	EPA Method 1602. <sup>11</sup>

Analyses must be conducted in accordance with the documents listed below. The Director of the Federal Register approves the incorporation by reference of the documents listed in footnotes 2-11 in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed below. Copies may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202-566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

<sup>1</sup> The time from sample collection to initiation of analysis may not exceed 30 hours. The ground water system is encouraged but is not required to hold samples below 10 °C during transit.

<sup>2</sup> Methods are described in Standard Methods for the Examination of Water and Wastewater 20th edition (1998) and copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC 20005-2605.

<sup>3</sup> Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092.

<sup>4</sup>EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821–R–02–024. Method is available at <http://www.epa.gov/nerlcwww/1604sp02.pdf> or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

<sup>5</sup>A description of the m-ColiBlue24 Test, "Total Coliforms and *E. coli* Membrane Filtration Method with m-ColiBlue24<sup>®</sup> Broth," Method No. 10029 Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

<sup>6</sup>A description of the E-Colite Test, "Charm E-Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water, January 9, 1998, is available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843–1032 or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

<sup>7</sup>EC–MUG (Method 9221F) or NA–MUG (Method 9222G) can be used for *E. coli* testing step as described in § 141.21(f)(6)(i) or (ii) after use of Standard Methods 9221 B, 9221 D, 9222 B, or 9222 C.

<sup>8</sup>EPA Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl-β-D-Glucoside Agar (mEI) EPA 821–R–02–022 (September 2002) is an approved variation of Standard Method 9230C. The method is available at <http://www.epa.gov/nerlcwww/1600sp02.pdf> or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460. The holding time and temperature for ground water samples are specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

<sup>9</sup>Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092. Preparation and use of the medium is set forth in the article "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters," by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881–3884.

<sup>10</sup>EPA Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure; April 2001, EPA 821–R–01–030. Method is available at <http://www.epa.gov/nerlcwww/1601ap01.pdf> or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

<sup>11</sup>EPA Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821–R–01–029. Method is available at <http://www.epa.gov/nerlcwww/1602ap01.pdf> or from EPA's Water Resource Center (RC–4100T), 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

(d) *Invalidation of a fecal indicator-positive ground water source sample.* (1) A ground water system may obtain State invalidation of a fecal indicator-positive ground water source sample collected under paragraph (a) of this section only under the conditions specified in paragraphs (d)(1)(i) and (ii) of this section.

(i) The system provides the State with written notice from the laboratory that improper sample analysis occurred; or

(ii) The State determines and documents in writing that there is substantial evidence that a fecal indicator-positive ground water source sample is not related to source water quality.

(2) If the State invalidates a fecal indicator-positive ground water source sample, the ground water system must collect another source water sample under paragraph (a) of this section within 24 hours of being notified by the State of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in paragraph (c) of this section. The State may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the State must specify how much time the system has to collect the sample.

(e) *Sampling location.* (1) Any ground water source sample required under paragraph (a) of this section must be collected at a location prior to any treatment of the ground water source

unless the State approves a sampling location after treatment.

(2) If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a State-approved location to meet the requirements of paragraph (a) of this section if the sample is representative of the water quality of that well.

(f) *New sources.* If directed by the State, a ground water system that places a new ground water source into service after November 30, 2009, must conduct assessment source water monitoring under paragraph (b) of this section. If directed by the State, the system must begin monitoring before the ground water source is used to provide water to the public.

(g) *Public notification.* A ground water system with a ground water source sample collected under paragraph (a) or (b) of this section that is fecal indicator-positive and that is not invalidated under paragraph (d) of this section, including consecutive systems served by the ground water source, must conduct public notification under § 141.202.

(h) *Monitoring violations.* Failure to meet the requirements of paragraphs (a)–(f) of this section is a monitoring violation and requires the ground water system to provide public notification under § 141.204.

[71 FR 65653, Nov. 8, 2006; 71 FR 67427, Nov. 21, 2006, as amended at 74 FR 30958, June 29, 2009; 78 FR 10353, Feb. 13, 2013]

~~At the same time as the sampling schedule required under §141.702. This description must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, phases of chemical treatment, and filter backwash recycle. If the State does not respond to a system regarding sampling location(s), the system must sample at the reported location(s).~~

**§ 141.704 Analytical methods.**

(a) *Cryptosporidium*. Systems must analyze for *Cryptosporidium* using *Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA*, 2005, United States Environmental Protection Agency, EPA-815-R-05-002 or *Method 1622: Cryptosporidium in Water by Filtration/IMS/FA*, 2005, United States Environmental Protection Agency, EPA-815-R-05-001, which are incorporated by reference, or alternative methods listed in appendix A to subpart C of this part. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of these methods online from <http://www.epa.gov/safewater/disinfection/t2> or from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave., NW., Washington, DC 20460 (Telephone: 800-426-4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW., Washington, DC (Telephone: 202-566-2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(1) Systems must analyze at least a 10 L sample or a packed pellet volume of at least 2 mL as generated by the methods listed in paragraph (a) of this section. Systems unable to process a 10 L sample must analyze as much sample volume as can be filtered by two filters approved by EPA for the methods listed in paragraph (a) of this section, up

to a packed pellet volume of at least 2 mL.

(2)(i) Matrix spike (MS) samples, as required by the methods in paragraph (a) of this section, must be spiked and filtered by a laboratory approved for *Cryptosporidium* analysis under §141.705.

(ii) If the volume of the MS sample is greater than 10 L, the system may filter all but 10 L of the MS sample in the field, and ship the filtered sample and the remaining 10 L of source water to the laboratory. In this case, the laboratory must spike the remaining 10 L of water and filter it through the filter used to collect the balance of the sample in the field.

(3) Flow cytometer-counted spiking suspensions must be used for MS samples and ongoing precision and recovery (OPR) samples.

(b) *E. coli*. System must use methods for enumeration of *E. coli* in source water approved in §136.3(a) of this chapter or alternative methods listed in appendix A to subpart C of this part.

(1) The time from sample collection to initiation of analysis may not exceed 30 hours unless the system meets the condition of paragraph (b)(2) of this section.

(2) The State may approve on a case-by-case basis the holding of an *E. coli* sample for up to 48 hours between sample collection and initiation of analysis if the State determines that analyzing an *E. coli* sample within 30 hours is not feasible. *E. coli* samples held between 30 to 48 hours must be analyzed by the Colilert reagent version of Standard Method 9223B as listed in §136.3(a) of this title.

(3) Systems must maintain samples between 0 °C and 10 °C during storage and transit to the laboratory.

(c) *Turbidity*. Systems must use methods for turbidity measurement approved in §141.74(a)(1).

[71 FR 769, Jan. 5, 2006, as amended at 74 FR 30959, June 29, 2009]

**§ 141.705 Approved laboratories.**

~~(a) *Cryptosporidium*. Systems must have *Cryptosporidium* samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water or a laboratory that has been certified to~~

~~of EPA, where EPA acts as the State, must comply with decisions made by EPA for implementation of subpart Y. EPA has authority to establish such procedures and criteria as are necessary to implement subpart Y.~~

~~(e) *Violations of national primary drinking water regulations.* Failure to comply with the applicable requirements of §§141.851 through 141.861, including requirements established by the State pursuant to these provisions, is a violation of the national primary drinking water regulations under subpart Y.~~

**§ 141.852 Analytical methods and laboratory certification.**

(a) *Analytical methodology.* (1) The standard sample volume required for analysis, regardless of analytical method used, is 100 ml.

(2) Systems need only determine the presence or absence of total coliforms

and *E. coli*; a determination of density is not required.

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

(4) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of *Standard Methods for the Examination of Water and Wastewater* (20th and 21st editions).

(5) Systems must conduct total coliform and *E. coli* analyses in accordance with one of the analytical methods in the following table or one of the alternative methods listed in Appendix A to subpart C of part 141.

Organism	Methodology category	Method <sup>1</sup>	Citation <sup>1</sup>
Total Coliforms	Lactose Fermentation Methods	Standard Total Coliform Fermentation Technique.	Standard Methods 9221 B.1, B.2 (20th ed.; 21st ed.), <sup>2,3</sup>
		Presence-Absence (P-A) Coliform Test	Standard Methods Online 9221 B.1, B.2-99, <sup>2,3</sup> Standard Methods 9221 D.1, D.2 (20th ed.; 21st ed.), <sup>2,7</sup>
	Membrane Filtration Methods	Standard Total Coliform Membrane Filter Procedure.	Standard Methods Online 9221 D.1, D.2-99, <sup>2,7</sup> Standard Methods 9222 B, C (20th ed.; 21st ed.), <sup>2,4</sup>
		Membrane Filtration using MI medium	Standard Methods Online 9222 B-97, <sup>2,4</sup> , 9222 C-97, <sup>2,4</sup> EPA Method 1604, <sup>2</sup>
		m-ColiBlue24 <sup>®</sup> Test <sup>2,4</sup>	
		Chromocult <sup>®</sup> 2,4	
	Enzyme Substrate Methods	Colisure <sup>®</sup>	Standard Methods 9223 B (20th ed.; 21st ed.), <sup>2,5</sup>
		E*Collie <sup>®</sup> Test <sup>2</sup>	Standard Methods Online 9223 B-97, <sup>2,5</sup>
		ReadyCult <sup>®</sup> Test <sup>2</sup>	Standard Methods 9223 B (20th ed.; 21st ed.), <sup>2,5,6</sup>
		modified Collitag <sup>®</sup> Test <sup>2</sup>	Standard Methods Online 9223 B-97, <sup>2,5,6</sup>
<i>Escherichia coli</i>	<i>Escherichia coli</i> Procedure (following Lactose Fermentation Methods)	EC-MUG medium	Standard Methods 9221 F.1 (20th ed.; 21st ed.), <sup>2</sup>
		EC broth with MUG (EC-MUG)	Standard Methods 9222 G.1c(2) (20th ed.; 21st ed.), <sup>2,8</sup>
		NA-MUG medium	Standard Methods 9222 G.1c(1) (20th ed.; 21st ed.), <sup>2</sup> EPA Method 1604, <sup>2</sup>
	Membrane Filtration Methods	Membrane Filtration using MI medium	Standard Methods 9223 B (20th ed.; 21st ed.), <sup>2,5</sup>
		m-ColiBlue24 <sup>®</sup> Test <sup>2,4</sup>	Standard Methods Online 9223 B-97, <sup>2,5,6</sup>
		Chromocult <sup>®</sup> 2,4	Standard Methods 9223 B (20th ed.; 21st ed.), <sup>2,5,6</sup>
	Enzyme Substrate Methods	Colisure <sup>®</sup>	Standard Methods Online 9223 B-97, <sup>2,5,6</sup>
		E*Collie <sup>®</sup> Test <sup>2</sup>	
		ReadyCult <sup>®</sup> Test <sup>2</sup>	
		modified Collitag <sup>®</sup> Test <sup>2</sup>	

<sup>1</sup>The procedures must be done in accordance with the documents listed in paragraph (c) of this section. For Standard Methods, either editions, 20th (1998) or 21st (2005), may be used. For the Standard Methods Online, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits following the hyphen in the method number. The methods listed are the only online versions that may be used. For vendor methods, the date of the method listed in paragraph (c) of this section is the date version of the approved method. The methods listed are the only versions that may be used for compliance with this rule. Laboratories should be careful to use only the approved versions of the methods, as product package inserts may not be the same as the approved versions of the methods.

- <sup>2</sup> Incorporated by reference. See paragraph (c) of this section.
- <sup>3</sup> Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than 10 percent.
- <sup>4</sup> All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.
- <sup>5</sup> Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
- <sup>6</sup> Colisure™ results may be read after an incubation time of 24 hours.
- <sup>7</sup> A, multiple tube enumerative format, as described in *Standard Methods for the Examination of Water and Wastewater* 9221, is approved for this method for use in presence-absence determination under this regulation.
- <sup>8</sup> The following changes must be made to the EC broth with MUG (EC–MUG) formulation: Potassium dihydrogen phosphate, KH<sub>2</sub>PO<sub>4</sub>, must be 1.5g, and 4-methylumbelliferyl-Beta-D-glucuronide must be 0.05 g.



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

(c) *Incorporation by reference.* The standards required in this section are incorporated by reference into this section with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, EPA must publish notice of change in the FEDERAL REGISTER and the material must be available to the public. All approved material is available for inspection either electronically at [www.regulations.gov](http://www.regulations.gov), in hard copy at the Water Docket, or from the sources indicated below. The Docket ID is EPA-HQ-OW-2008-0878. Hard copies of these documents may be viewed at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is 1-202-566-1744, and the telephone number for the Water Docket is 1-202-566-2426. Copyrighted materials are only available for viewing in hard copy. These documents are also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 1-202-741-6030 or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(1) American Public Health Association, 800 I Street, NW., Washington, DC 20001.

(i) "Standard Methods for the Examination of Water and Wastewater," 20th edition (1998):

(A) Standard Methods 9221, "Multiple-Tube Fermentation Technique for Members of the Coliform Group," B.1, B.2, "Standard Total Coliform Fermentation Technique."

(B) Standard Methods 9221, "Multiple-Tube Fermentation Technique for Members of the Coliform Group," D.1, D.2, "Presence-Absence (P-A) Coliform Test."

(C) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," B, "Standard Total Coliform Membrane Filter Procedure."

(D) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," C, "Delayed-Incubation Total Coliform Procedure."

(E) Standard Methods 9223, "Enzyme Substrate Coliform Test," B, "Enzyme Substrate Test," Colilert® and Colisure®.

(F) Standard Methods 9221, "Multiple Tube Fermentation Technique for Members of the Coliform Group," F.1, "Escherichia coli Procedure: EC-MUG medium."

(G) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," G.1.c(2), "Escherichia coli Partition Method: EC broth with MUG (EC-MUG)."

(H) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," G.1.c(1), "Escherichia coli Partition Method: NAMUG medium."

(ii) "Standard Methods for the Examination of Water and Wastewater," 21st edition (2005):

(A) Standard Methods 9221, "Multiple-Tube Fermentation Technique for Members of the Coliform Group," B.1, B.2, "Standard Total Coliform Fermentation Technique."

(B) Standard Methods 9221, "Multiple-Tube Fermentation Technique for Members of the Coliform Group," D.1, D.2, "Presence-Absence (P-A) Coliform Test."

(C) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," B, "Standard Total Coliform Membrane Filter Procedure."

(D) Standard Methods 9222, "Membrane Filter Technique for Members of the Coliform Group," C, "Delayed-Incubation Total Coliform Procedure."

(E) Standard Methods 9223, "Enzyme Substrate Coliform Test," B, "Enzyme Substrate Test," Colilert® and Colisure®.

(F) Standard Methods 9221, “Multiple Tube Fermentation Technique for Members of the Coliform Group,” F.1, “*Escherichia coli* Procedure: EC–MUG medium.”

(G) Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1.c(2), “*Escherichia coli* Partition Method: EC broth with MUG (EC–MUG).”

(H) Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1.c(1), “*Escherichia coli* Partition Method: NA–MUG medium.”

(iii) “Standard Methods Online” available at <http://www.standardmethods.org>:

(A) Standard Methods Online 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group” (1999), B.1, B.2–99, “Standard Total Coliform Fermentation Technique.”

(B) Standard Methods Online 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group” (1999), D.1, D.2–99, “Presence-Absence (P–A) Coliform Test.”

(C) Standard Methods Online 9222, “Membrane Filter Technique for Members of the Coliform Group” (1997), B–97, “Standard Total Coliform Membrane Filter Procedure.”

(D) Standard Methods Online 9222, “Membrane Filter Technique for Members of the Coliform Group” (1997), C–97, “Delayed-Incubation Total Coliform Procedure.”

(E) Standard Methods Online 9223, “Enzyme Substrate Coliform Test” (1997), B–97, “Enzyme Substrate Test”, Colilert® and Colisure®.

(2) Charm Sciences, Inc., 659 Andover Street, Lawrence, MA 01843–1032, telephone 1–800–343–2170:

(i) E\*Colite®—“Charm E\*Colite™ Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water,” January 9, 1998.

(ii) [Reserved]

(3) CPI International, Inc., 5580 Skylane Blvd., Santa Rosa, CA, 95403, telephone 1–800–878–7654:

(i) modified Colitag®, ATP D05–0035—“Modified Colitag™ Test Method for the Simultaneous Detection of *E. coli*

and other Total Coliforms in Water,” August 28, 2009.

(ii) [Reserved]

(4) EMD Millipore (a division of Merck KGaA, Darmstadt Germany), 290 Concord Road, Billerica, MA 01821, telephone 1–800–645–5476:

(i) Chromocult—“Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia coli* for Finished Waters,” November 2000, Version 1.0.

(ii) Readycult®—“Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters,” January 2007, Version 1.1.

(5) EPA’s Water Resource Center (MC–4100T), 1200 Pennsylvania Avenue NW., Washington, DC 20460, telephone 1–202–566–1729:

(i) EPA Method 1604, EPA 821–R–02–024—“EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium),” September 2002, <http://www.epa.gov/nerlcwww/1604sp02.pdf>.

(ii) [Reserved]

(6) Hach Company, P.O. Box 389, Loveland, CO 80539, telephone 1–800–604–3493:

(i) m-ColiBlue24®—“Membrane Filtration Method m-ColiBlue24® Broth,” Revision 2, August 17, 1999.

(ii) [Reserved]

[78 FR 10354, Feb. 13, 2013, as amended at 79 FR 10669, Feb. 26, 2014]

**§ 141.853 General monitoring requirements for all public water systems.**

(a) *Sample siting plans.* (1) Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system not later than March 31, 2016. These plans are subject to State review and revision. Systems must collect total coliform samples according to the written sample siting plan. Monitoring required by §§ 141.854 through 141.858 may take place at a customer’s premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling