



Analytical Methods Approved for Compliance Monitoring under the Revised Total Coliform Rule

Analysis for the following contaminants shall be conducted in accordance with the methods in the following table, or their equivalent as determined by EPA. The methods and monitoring requirements for these contaminants are specified in 40 CFR 141.852(a)(5). Additional methods are listed in Appendix A to Subpart C of Part 141.

The CFR is the legal reference for approved methods and takes precedent over this table. The table should accurately reflect the analytical methods information published in 40 CFR 141. If discrepancies are found, please notify the Safe Drinking Water Hotline (800-426-4791) so that EPA can correct the table.

§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°C during transit.
- (4) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of *Standard Methods for the Examination of Water and Wastewater* (20th and 21st editions).
- (5) Systems must conduct total coliform and *E.coli* analyses in accordance with one of the analytical methods in the table at §141.852 or one of the alternative methods listed in Appendix A to Subpart C of Part 141.

The procedures must be done in accordance with the documents listed at paragraph (c) of §141.852 or one of the alternative methods listed in Appendix A to Subpart C of Part 141. For 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 of the method that maybe used. For vendor methods, the date of the method listed in paragraph (c) of §141.852 or Appendix A to Subpart C of Part 141 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 packaging inserts may not be the same as the approved versions of the methods.

- (b) Laboratory certification- systems must have all compliance samples required under this subpart analyzed by a laboratory certified by 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) Incorporate by reference – The standards required in §141.852 (a) are incorporated by reference into the regulation.

Contaminant

Total Coliforms - lactose fermentation methods:

Method	Organization	Reference Title	Date	Notes
9221 B.1, B.2	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20th Edition</i>	1998	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 the false-negative rate for total coliforms, using lactose broth, is less than 10 percent
9221 B.1, B.2	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	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 the false-negative rate for total coliforms, using lactose broth, is less than 10 percent
9221 B.1, B.2	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	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 the false-negative rate for total coliforms, using lactose broth, is less than 10 percent
9221 B.1, B.2-99	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1999	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 the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.
9221 B.1, B.2-06	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2006	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 the false-negative rate for total coliforms, using lactose broth, is less than 10 percent

Method	Organization	Reference Title	Date	Notes
9221 D.1, D.2	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	A multiple tube enumerative format, as described in <i>Standard Methods for the Examination of Water and Wastewater</i> 9221, is approved for this method for use in presence-absence determination under this regulation.
9221 D.1, D.2	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 st Edition	2005	A multiple tube enumerative format, as described in <i>Standard Methods for the Examination of Water and Wastewater</i> 9221, is approved for this method for use in presence-absence determination under this regulation.
9221 D.1, D.2-99	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1999	A multiple tube enumerative format, as described in <i>Standard Methods for the Examination of Water and Wastewater</i> 9221, is approved for this method for use in presence-absence determination under this regulation.

Total coliforms - membrane filtration methods:

Method	Organization	Reference Title	Date	Notes
9222 B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.
9222 B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 st Edition	2005	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.
9222 B, C-97	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.
1604	EPA	Method 1604: Total Coliforms and <i>Escherichia coli</i> in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium), September 2002	2002	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.
m-ColiBlue24®Test	Hach Company	Membrane Filtration Method m-ColiBlue24® Broth, Revision 2, August 17, 1999	1999	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.

Method	Organization	Reference Title	Date	Notes
Chromocult	EMD Millipore	Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> for Finished Waters, November 2000, Version 1.0	2000	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.

Total coliforms - enzyme substrate methods:

Method	Organization	Reference Title	Date	Notes
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 st Edition	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 22 nd Edition	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B-97 Colilert®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B-04 Colilert®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.

Method	Organization	Reference Title	Date	Notes
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B-97 Colisure®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B-04 Colisure®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20th Edition</i>	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B-04 Colilert-18®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.

Method	Organization	Reference Title	Date	Notes
		Subpart C of Part 141 are approved.		
E*Colite®	Charm Sciences	Charm E*Colite™ Presence/Absence Test for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> in Drinking Water, January 9, 1998	1998	
Readycult®	EMD Millipore	Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> in Finished Waters, January 2007, Version 1.1	2007	
Modified Colitag®	CPI International, Inc.	Modified Colitag™ Test Method for the Simultaneous Detection of <i>E. coli</i> and other Total Coliforms in water (ATP D05-0035), August 28, 2009	2009	
Tecta EC/TC	Veolia Water Solutions and Technologies	Tecta™ EC/TC medium and the Tecta™ Instrument: A Presence/Absence Method for Simultaneous Detection of Total Coliforms and <i>Escherichia coli</i> (<i>E. coli</i>) in Drinking Water, May 22, 2014, Version 1.0	2014	

Contaminant

Escherichia coli - Procedure (following Lactose Fermentation Methods):

Method	Organization	Reference Title	Date	Notes
9221 F.1	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	
9221 F.1	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 st Edition	2005	

Method	Organization	Reference Title	Date	Notes
9221 F.1	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	
9221 F.1-06	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2006	

Contaminant

Escherichia coli - Partition methods:

Method	Organization	Reference Title	Date	Notes
9222 G.1c(2)	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20th Edition</i>	1998	
9222 G.1c(2)	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	
9222 G.1c(1)	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20th Edition</i>	1998	
9222 G.1c(1)	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	

Contaminant

Escherichia coli - membrane filtration methods:

Method	Organization	Reference Title	Date	Notes
1604	EPA	Method 1604: Total Coliforms and <i>Escherichia coli</i> in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium), September 2002	2002	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.
m-ColiBlue24 [®] Test	Hach Company	Membrane Filtration Method m-ColiBlue24 [®] Broth, Revision 2, August 17, 1999	1999	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.

Method	Organization	Reference Title	Date	Notes
Chromocult	EMD Millipore	Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> for Finished Waters, November 2000, Version 1.0	2000	All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving.

Contaminant

Escherichia coli - enzyme substrate methods:

Method	Organization	Reference Title	Date	Notes
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 st Edition	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 22 nd Edition	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert® B-97	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert® B-04	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 th Edition	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.

Method	Organization	Reference Title	Date	Notes
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B Colisure®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B-97 Colisure®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B Colisure® B-04	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation. Colisure results may be read after an incubation time of 24 hours.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20th Edition</i>	1998	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21st Edition</i>	2005	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B Colilert-18®	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22nd Edition</i>	2012	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.
9223 B-04 Colilert-18®	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this regulation.

Method	Organization	Reference Title	Date	Notes
E*Colite®	Charm Sciences	Charm E*Colite™ Presence/Absence Test for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> in Drinking Water, January 9, 1998	1998	
Readycult®	EMD Millipore	Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and <i>Escherichia coli</i> in Finished Waters, January 2007, Version 1.1	2007	
Modified Colitag®	CPI International, Inc.	Modified Colitag™ Test Method for the Simultaneous Detection of <i>E. coli</i> and other Total Coliforms in water (ATP D05- 0035), August 28, 2009	2009	
Tecta EC/TC	Veolia Water Solutions and Technologies	Tecta™ EC/TC medium and the Tecta™ Instrument: A Presence/Absence Method for Simultaneous Detection of Total Coliforms and <i>Escherichia coli</i> (<i>E. coli</i>) in Drinking Water, May 22, 2014, Version 1.0	2014	