

Analytical Methods Approved for Compliance Monitoring under the Surface Water Treatment 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 141.74(a)(1) and 40 CFR 141.74(a)(2). 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.

§141.74(a)(1)– Analytical and monitoring requirements

(a)(1) Analytical requirements

(1) The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10 °C during transit.

The procedures must be done in accordance with the documents listed at 141.74(a)(1) 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 141.74(a)(1) 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.

Contaminant

Total Coliforms - lactose fermentation methods:

Method	Organization	Reference Title/Source	Date	Notes
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added.

Method	Organization	Reference Title/Source	Date	Notes
				No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition <u>Standard Methods</u>	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

Method	Organization	Reference Title/Source	Date	Notes
				rate for total coliforms, using lactose broth, is less than 10 percent. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.
9221 A, B, C-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. <u>Standard Methods</u>	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.

Method	Organization	Reference Title/Source	Date	Notes
9221 A, B, C-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. <u>Standard Methods</u>	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. Media should cover inverted tubes at least one-half to two- thirds after the sample is added. No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.

Total coliforms - membrane filtration methods:

Method	Organization	Reference Title/Source	Date	Notes
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	
9222 A, B, C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	

Method	Organization	Reference Title/Source	Date	Notes
9222 A, 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. <u>Standard Methods</u>	1997	
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 <u>EPA Method 1604</u>	2002	Verification of colonies is not required.

Total coliforms - enzyme substrate methods:

Method	Organization	Reference Title/Source	Date	Notes
9223 Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	
9223 Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	
9223 Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	
9223 Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	
9223 B Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition Standard Methods	2012	

Method	Organization	Reference Title/Source	Date	Notes
9223 B Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	
9223 B Colilert	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	
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. <u>Standard Methods</u>	1997	
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. <u>Standard Methods</u>	2004	

Fecal coliforms – Fecal Coliform Procedure (following Lactose Fermentation Methods):

Method	Organization	Reference Title/Source	Date	Notes
		Standard Methods for the		
0221 E	Standard Mothods	Examination of Water and	1002	A-1 broth may be held up to 7 days in a tightly closed screw cap
9221 L	Standard Methods	Wastewater, 18 th Edition	1992	tube at 4°C
		Standard Methods		
		Standard Methods for the		
0221 5	Standard Mothods	Examination of Water and	1005	A-1 broth may be held up to 7 days in a tightly closed screw cap
9221 E	Standard Methods	Wastewater, 19 th Edition	1995	tube at 4°C
		Standard Methods		

Method	Organization	Reference Title/Source	Date	Notes
9221 E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition <u>Standard Methods</u>	2012	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E-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. <u>Standard Methods</u>	1999	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E-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. <u>Standard Methods</u>	2006	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C

Fecal coliforms – membrane filtration methods:

Method	Organization	Reference Title/Source	Date	Notes
9222 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	
9222D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	
9222 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	
9222D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	
9222 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition Standard Methods	2012	
9222 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	
9222 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	
9222 D-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. <u>Standard Methods</u>	1997	

Method	Organization	Reference Title/Source	Date	Notes
9222 D-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. <u>Standard Methods</u>	2006	

Heterotrophic bacteria – culture method:

Method	Organization	Reference Title/Source	Date	Notes
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition <u>Standard Methods</u>	2012	
9215 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	

Method	Organization	Reference Title/Source	Date	Notes
9215 B-00	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.	2000	
9215 B-04	Standard Methods Online	Standard Methods 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. Standard Methods	2004	

Heterotrophic bacteria - enzyme substrate methods:

Method	Organization	Reference Title/Source	Date	Notes
		IDEXX SimPlate [™] HPC test		
		method for Heterotrophs in		
Simplate	IDEXX	Water, November 2000.	2000	
		IDEXX Laboratories, One IDEXX		
		Drive, Westbrook, ME 04092		

Contaminant

Turbidity methods:

Method	Organization	Reference Title/Source	Date	Notes
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition <u>Standard Methods</u>	1992	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition <u>Standard Methods</u>	1995	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin

Method	Organization	Reference Title/Source	Date	Notes
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition <u>Standard Methods</u>	1998	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition <u>Standard Methods</u>	2005	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition <u>Standard Methods</u>	2012	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition <u>Standard Methods</u>	2017	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition <u>Standard Methods</u>	2023	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
180.1	EPA	Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993 <u>National Environmental</u> <u>Methods Index</u>	1993	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Method 2	Great Lakes Instruments	Great Lakes Instruments Method 2, Turbidity, November 2, 1992 <u>GLI Method 2</u>	1992	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
10133	Hach	Hach FilterTrak Method 10133, Revision 2.0, Determination of Turbidity by Laser Nephelometry, January 2000 Hach FilterTrak Method 10133	2000	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin

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Method	Organization	Reference Title/Source	Date	Notes
M5271	Leck Mitchell	Mitchell Method M5271, Revision 1.1, Determination of Turbidity by Laser Nephelometry, March 5, 2009 <u>Mitchell M5271, Rev. 1.1</u>	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
M5331	Leck Mitchell	Mitchell Method M5331, Revision 1.1, Determination of Turbidity by LED Nephelometry, March 5, 2009 <u>Mitchell M5331, Rev. 1.1</u>	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
AMI Turbiwell	Swan Analytische Instrumente AG	Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter, August 2009 <u>SWAN AMI Turbiwell</u>	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
AQ4500	Thermo Scientific	Orion Method AQ4500, Revision 1.0, Determination of Turbidity by LED Nephelometry, May 8, 2009 <u>Orion AQ4500, Rev. 1.0</u>	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
M5331 (Rev. 1.2)	Leck Mitchell	Mitchell Method M5331, Revision 1.2 Determination of Turbidity by LED or Laser Nephelometry, February 2016 <u>Mitchell M5331, Rev. 1.2</u>	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
10258 (Rev. 1.0)	Hach Company	Hach Method 10258, Rev. 1.0 Determination of Turbidity by 360° Nephelometry, January 2016 <u>Hach 10258, Rev. 1.0</u>	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
10258 (Rev. 2.0)	Hach Company	Hach Method 10258, Rev. 2.0 Determination of Turbidity by 360° Nephelometry, March 2018 Hach 10258, Rev. 2.0	2018	Revised method allows the use of sealed vials prefilled with Hach StablCal™ for quarterly calibration

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Method	Organization	Reference Title/Source	Date	Notes
8195 (Rev. 3.0)	Hach Company	Hach Method 8195, Rev. 3.0 Determination of Turbidity by Nephelometry, March 2018 <u>Hach 8195, Rev. 3.0</u>	2018	Revised method allows the use of sealed vials prefilled with Hach StablCal™ for quarterly calibration
Lovibond PTV 1000	Tintometer, Inc.	Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV 1000 White Light LED Turbidimeter, December 2016 Lovibond PTV 1000, Rev. 1.0	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Lovibond PTV 2000	Tintometer, Inc.	Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV 2000 660-nm LED Turbidimeter, December 2016 Lovibond PTV 2000, Rev. 1.0	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Lovibond PTV 6000	Tintometer, Inc.	Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV 6000 Laser Turbidimeter, December 2016 Lovibond PTV 6000, Rev. 1.0	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Lovibond TB 3500	Tintometer, Inc.	Measurement of Drinking Water Turbidity of a Captured Sample using a Lovibond White Light LED Portable Turbidimeter Lovibond TB 3500, Rev. 1.0	2021	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Lovibond TB 5000	Tintometer, Inc.	Measurement of Drinking Water Turbidity of a Captured Sample using a Lovibond 660-nm LED Portable Turbidimeter Lovibond TB 5000, Rev. 1.0	2021	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Lovibond TB 6000	Tintometer, Inc.	Measurement of Drinking Water Turbidity of a Captured Sample using a Lovibond Portable Laser Turbidimeter Lovibond TB 6000, Rev. 1.0	2021	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin

Method	Organization	Reference Title/Source	Date	Notes
Yokogawa Method 820	Yokogawa Electric Corporation	Yokogawa Method 820 - Measurement of Turbidity in Drinking Water by Right Angle Scattered Light Turbidity Analyzer <u>Yokogawa Method 820</u>	2022	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stablilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin

§141.74(a)(2)– Public water systems must measure residual disinfectant concentrations with one of the analytical methods in the following table or one of the alternative methods listed in appendix A to subpart C of this part. If approved by the State, residual disinfectant concentrations for free chlorine and combined chlorine also may be measured by using DPD colorimetric test kits. In addition, States may approve the use of the ITS free chlorine test strip for the determination of free chlorine. Use of the test strips is described in Method D99-003, "Free Chlorine Species (HOCl⁻ and OCl⁻) by Test Strip," Revision 3.0, November 21, 2003, available from Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730. Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same.

Free Chlorine

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
00-003	Industrial Test	Free Chlorine Species (HOCl ⁻ and	November		Method D99-003
099-003	Systems, Inc.	OCI ⁻) by Test Strip	2003		<u>Method D33-005</u>
D1252-02	ASTM	Standard Test Method for Residual	2003		ASTM International
D1255-05	International	Chlorine in Water	2003		ASTWITTEETTational
D1252.09	ASTM	Standard Test Method for Residual	2008		ASTM International
D1255-08	International	Chlorine in Water	2008		ASTMITTEINATIONAL
D1252 14	ASTM	Standard Test Method for Residual	2014		ASTM International
D1255-14	International	Chlorine in Water	2014		<u>ASTM International</u>
		Determination of Residual Chlorine	September		
334.0	EPA	in Drinking Water using an On-line	2009	EPA 815-B-09-013	<u>EPA 815-B-09-013</u>
		Chlorine Analyzer			
		Determination of Chlorinated			
Hach 10260		Oxidants (Free and Total) in			
Roy 1.0	Hach Company	Water using Disposable Planar	April 2013		<u>Hach 10260, Rev. 1.0</u>
NEV. 1.0		Reagent-Filled Cuvettes and			
		Mesofluidic Channel Colorimetry			

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
Hach 10241, Rev. 1.2	Hach Company	Spectrophotometric Measurement of Free Chlorine (Cl2) in Finished Drinking Water	November 2015		<u>Hach 10241, Rev. 1.2</u>
ChloroSense	Palintest	Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense	August 2009		<u>ChloroSense</u>
ChloroSense, Rev. 1.1	Palintest	Free and Total Chlorine in Drinking Water by Amperometry using Disposable Sensors	February 2020		<u>ChloroSense, Rev. 1.1</u>
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl H	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-CI D-00	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.	2000		Standard Methods
4500-Cl F-00	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.	2000		Standard Methods
4500-Cl G-00	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.	2000		Standard Methods
4500-Cl H-00	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.	2000		Standard Methods

Total Chlorin<u>e</u>

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
D1253-03	ASTM International	Standard Test Method for Residual Chlorine in Water	2003		ASTM International
D1253-08	ASTM International	Standard Test Method for Residual Chlorine in Water	2008		ASTM International
D1253-14	ASTM International	Standard Test Method for Residual Chlorine in Water	2014		ASTM International
334.0	EPA	Determination of Residual Chlorine in Drinking Water using an On-line Chlorine Analyzer	September 2009	EPA 815-B-09-013	<u>EPA 815-B-09-013</u>
Hach 10260, Rev. 1.0	Hach Company	Determination of Chlorinated Oxidants (Free and Total) in Water using Disposable Planar Reagent-Filled Cuvettes and Mesofluidic Channel Colorimetry	April 2013		<u>Hach 10260, Rev. 1.0</u>
ChloroSense	Palintest	Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense	August 2009		<u>ChloroSense</u>
ChloroSense, Rev. 1.1	Palintest	Free and Total Chlorine in Drinking Water by Amperometry using Disposable Sensors	February 2020		<u>ChloroSense, Rev. 1.1</u>
127	EPA	Determination of Monochloramine Concentration in Drinking Water	January 2021	EPA 815-B-21-004	<u>EPA 815-B-21-004</u>
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-CI D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-CI D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-CI E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods

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4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl F	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl G	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater. 19 th Edition	1995		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-Cl I	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-CI D-00	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.	2000		Standard Methods
4500-CI E-00	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.	2000		<u>Standard Methods</u>
4500-Cl F-00	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.	2000		Standard Methods
4500-Cl G-00	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.	2000		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-Cl I-00	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.	2000		Standard Methods

Chlorine Dioxide

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
327, Rev. 1.1	EPA	Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrometry	May 2005	EPA-815-R-05-008	EPA-815-R-05-008
ChlordioX Plus	Palintest	Palintest ChlordioX Plus Method – Chlorine Dioxide and Chlorite in Drinking Water by Amperometry using Disposable Sensors	November 2013		<u>ChlordioX Plus</u>
ChlordioX Plus, Rev. 1.1	Palintest	Chlorine Dioxide and Chlorite in Drinking Water by Amperometry using Disposable Sensors	February 2020		<u>ChlordioX Plus, Rev. 1.1</u>
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-CIO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-ClO ₂ C	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-ClO ₂ D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-CIO ₂ D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-CIO2 D	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-ClO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-CIO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-CIO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-CIO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-CIO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-CIO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-ClO ₂ E	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-ClO ₂ C- 00	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the	2000		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
		regulations or in Appendix A to Subpart C of Part 141 are approved.			
4500-ClO ₂ E- 00	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.	2000		Standard Methods

Ozone

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 18 th Edition	1992		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 19 th Edition	1995		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 20 th Edition	1998		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 21 st Edition	2005		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 22 nd Edition	2012		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 23 rd Edition	2017		Standard Methods
4500-O₃ B	Standard Methods	Standard Methods for the Examination of Water and Wastewater, 24 th Edition	2023		Standard Methods
4500-O₃ 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	1997		Standard Methods

Method	Organization	Reference Title	Date	EPA Publication Number	Source of Method
		Subpart C of Part 141 are approved.			