

567—41.7(455B) Groundwater (GW) rule: sanitary survey, microbial source water monitoring, TT.**41.7(1) General requirements.**

a. Scope. The requirements of this rule constitute national primary drinking water regulations.

b. Applicability. This rule applies to all PWSs that use GW, except for PWSs that combine all of their GW with SW or with IGW prior to treatment under 567—43.5(455B). For the purposes of this rule, “GW system” is defined as any PWS meeting this applicability statement, including consecutive systems receiving finished GW. For the purposes of this rule, “4-log virus treatment” means treatment that includes inactivation, removal, or a department-approved combination of inactivation and removal before or at the first customer of 4-log (99.99 percent) of viruses.

c. General. Systems subject to this rule must comply with the following:

- (1) Sanitary survey requirements for all GW systems are described in 41.7(2).
- (2) Microbial source water monitoring requirements for GW systems that do not treat all of their GW to at least 99.99 percent (4-log) virus treatment, as described in 41.7(3).
- (3) TT requirements that apply to GW systems either with fecally contaminated source waters, as determined by monitoring conducted under 41.7(3), or with significant department-identified deficiencies. A GW system with fecally contaminated source water or with significant deficiencies subject to the TT requirements of this rule must implement one or more of the following corrective action options:
 1. Correct all significant deficiencies;
 2. Provide an alternate source of water;
 3. Eliminate the source of contamination; or
 4. Provide treatment that reliably achieves at least 4-log virus treatment before or at the first customer.

(4) GW systems that provide at least 4-log virus treatment must conduct compliance monitoring to demonstrate treatment effectiveness, as described in 41.7(4).

(5) If requested, GW systems must provide information that will enable the department to perform a hydrogeologic sensitivity assessment. For the purposes of this rule, “hydrogeologic sensitivity assessment” is a determination of whether GW systems obtain water from hydrogeologically sensitive settings.

(6) Analyses under this rule shall only be conducted by laboratories certified in accordance with 567—Chapter 83.

41.7(2) Sanitary surveys for GW systems. For the purposes of this rule, a “sanitary survey” conducted in accordance with 567—subrule 43.1(7), includes, but is not limited to, an on-site review of the water sources (identifying sources of contamination using source water assessments or other relevant information), facilities, equipment, operation, maintenance, and monitoring compliance of a PWS.

41.7(3) GW source microbial monitoring and analytical methods. A GW system that has a department-approved 4-log virus treatment process and is fulfilling the requirements of 41.7(4) “b” is not required to conduct the triggered source water monitoring under 41.7(3) “a.”

a. Triggered source water monitoring requirements.

- (1) General. A GW system must conduct triggered source water monitoring if it:
 1. Does not provide at least 4-log virus treatment for each GW source; and
 2. Is notified that a sample collected under 41.2(1) “e” and “f” is total coliform-positive, and the sample is not invalidated under 41.2(1) “d.”
- (2) Sampling. A GW system must collect at least one GW source sample from each GW source in use at the time the total coliform-positive sample was collected under 41.2(1) “e” and “f” that could have reasonably contributed to the positive sample. The source sample must be collected within 24 hours of the system’s receipt of the total coliform-positive sample.
 1. The department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the GW source sample within 24 hours due to circumstances beyond its control. The department must specify how much time the system has to collect the sample.
 2. A GW system serving 1,000 or fewer people may use a repeat sample collected from a GW source to meet both the requirements of 41.2(1) “g” and this paragraph if:
 - The department approves the use of *E. coli* as the fecal indicator,
 - The system only has one GW source required to be sampled,

- The system has no treatment, and
- Should the source water sample be *E. coli*-positive, the system would incur an acute coliform bacteria MCL violation, and would need to comply with Tier 1 PN requirements and the additional sample monitoring in 41.7(3)“a”(3).

(3) Additional sampling. Unless the department requires corrective action for a valid triggered source water sample that tested positive for the fecal indicator, the system must collect five additional source water samples from that same source within 24 hours of receipt of a fecal indicator-positive sample result.

(4) Consecutive and wholesale systems. In addition to the other requirements in this paragraph:

1. A consecutive GW system that has a total coliform-positive sample collected under 41.2(1)“f” must notify the wholesale system(s) within 24 hours of receipt of the total coliform-positive sample, and
2. A wholesale GW system that does not provide 4-log virus treatment must comply with the following:

- A wholesale GW system that receives notice from a consecutive system it serves that a sample collected under 41.2(1)“f” is total coliform-positive must, within 24 hours of receipt, collect triggered sample(s) from its GW source(s) under 41.7(3)“a”(2) and analyze the sample(s) for a fecal indicator.

- If the triggered source sample(s) is fecal indicator-positive, the wholesale GW system must, within 24 hours of receipt of the result, notify all consecutive systems served by that GW source of the fecal indicator-positive result and collect the required additional five source water samples in accordance with 41.7(3)“a.”

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

1. The department determines in writing that the total coliform-positive sample collected under 41.2(1)“e” and “f” was caused by a distribution system deficiency; or
2. The total coliform-positive sample collected under 41.2(1)“e” and “g” is collected at a location that meets department criteria for distribution system conditions that will cause total coliform-positive samples.

b. Assessment source water monitoring. If directed by the department, GW systems must conduct assessment source water monitoring that meets department-determined requirements. GW systems conducting assessment source water monitoring may use a triggered source water sample collected under 41.7(3)“a”(2) to meet the requirements of this paragraph. Department-determined assessment source water monitoring requirements may include:

(1) Collection of:

1. A total of 12 GW source samples representing each month the system provides GW to the public;
2. Samples from each well, unless the system obtains written department approval to conduct monitoring at one or more wells within the GW system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting;
3. A standard sample volume of at least 100 mL for fecal indicator analysis, regardless of technical indicator or analytical method used;
4. GW source samples at a location before any treatment of the GW source, unless the department approves a sampling location after treatment; and
5. GW source samples at the well itself, unless the system’s configuration does not allow for sampling at the well itself and the department approves an alternate sampling location representative of the water quality of that well; or

(2) Analysis of all GW source samples using one of the analytical methods listed in 41.7(3)“c” for the presence of *E. coli*, enterococci, or coliphage.

c. Analytical methods.

(1) GW systems subject to the source water monitoring requirements of this rule 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) GW systems must analyze all GW source samples collected under this rule using one of the analytical methods in the following table for the presence of *E. coli*, enterococci, or coliphage.

Analytical Methods for Source Water Monitoring

Fecal Indicator ¹	Methodology	Method Citation
<i>E. coli</i>	Colilert ³	9223B ² , 12, 13, 9223 B-97, B-04 ¹⁸
	Colisure ³	9223B ² , 12, 13, 9223 B-97, B-04 ¹⁸
	Membrane filter method with MI agar	EPA Method 1604 ⁴
	Colilert-18	9223B ² , 12, 13, 9223B-97, B-0418
	m-ColiBlue24 Test ⁵	
	E*Colite Test ⁶	
	EC-MUG ⁷	9221F ² , 13, 9221 F-06 ¹⁸
	NA-MUG ⁷	9222G ²
	Readycult	Readycult ¹⁴
	Colitag	Modified Colitag ¹⁵
	Chromocult	Chromocult ¹⁶
	Tecta EC/TC	Tecta EC/TC ¹⁹
Enterococci	Multiple-tube technique	9230B ² , 9230 B-04 ¹⁸
	Membrane filter technique	9230C ² , EPA Method 1600 ⁸
	Enterolert ⁹	
Coliphage	Two-step enrichment presence-absence procedure	EPA Method 1601 ¹⁰ , FastPhage ¹⁷
	Single agar layer procedure	EPA Method 1602 ¹¹

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 through 11 in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from the sources listed below or inspected at EPA's Drinking Water Docket or at NARA.

¹The time from sample collection to initiation of analysis may not exceed 30 hours. GW systems are encouraged but not required to hold samples below 10 degrees Celsius during transit.

²Methods are described in SM, 20th edition (1998).

³Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 04092.

⁴EPA 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, www.nemi.gov.

⁵A description of the m-ColiBlue24 Test, "Total Coliforms and *E. coli* Membrane Filtration Method with m-ColiBlue24 Broth," Method No. 10029, Revision 2, August 17, 1999, Hach Company, 100 Dayton Avenue, Ames, IA 50010.

⁶A 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, Charm Sciences, Inc., 659 Andover Street, Lawrence, MA 01843-1032.

⁷EC-MUG (Method 9221F) or NA-MUG (Method 9222G) can be used for *E. coli* testing step as described in 41.2(1)"f"(6) or (7) after use of SM 9221B, 9221D, 9222B, or 9222C.

⁸EPA 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 SM 9230C, www.nemi.gov. The holding time and temperature for GW samples is specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

⁹Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 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.

¹⁰EPA Method 1601: Male-Specific (F+) and Somatic Coliphage in Water by Two-Step Enrichment Procedure; April 2001, EPA 821-R-01-030, www.nemi.gov.

¹¹EPA Method 1602: Male-Specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821-R-01-029, www.nemi.gov.

¹²SM, 21st edition (2005).

¹³SM, 22nd edition (2012).

¹⁴ReadyCult Method, "ReadyCult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters," January 2007, Version 1.1. EMD Millipore, 290 Concord Road, Billerica, MA 01821.

¹⁵Modified Colitag Method, "Modified Colitag Test Method for the Simultaneous Detection of *E. coli* and Other Total Coliforms in Water (ATP D05-0035)," August 28, 2009, www.nemi.gov or CPI International, 5580 Skylane Blvd., Santa Rosa, CA 95403.

¹⁶Chromocult Method, "Chromocult Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters," November 2000, Version 1.0. EMD Millipore, 290 Concord Road, Billerica, MA 01821.

¹⁷Charm Sciences, Inc., "FastPhage Test Procedure. Presence/Absence for Coliphage in Ground Water with Same Day Positive Prediction," Version 009, November 2012, www.federalregister.gov.

¹⁸SM Online. The year in which each method was approved is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

¹⁹Tecta EC/TC. "Presence/Absence Method for Simultaneous Detection of Total Coliforms and *Escherichia coli* in Drinking Water," April 2014. Veolia Water Solutions and Technologies, Suite 4697, Biosciences Complex, 116 Barrie Street, Kingston, Ontario, Canada K7L 3N6.

d. Invalidation of a fecal indicator-positive GW source sample.

(1) GW systems may obtain invalidation from the department of a fecal indicator-positive GW source sample collected under 41.7(3)"a" only under these conditions:

1. The system provides the department with written notice from the laboratory that improper sample analysis occurred; or
2. The department determines in writing that there is substantial evidence that a fecal indicator-positive GW source sample is not related to source water quality.

(2) If the department invalidates a fecal indicator-positive GW source sample, the system must collect another source water sample under 41.7(3)"a" within 24 hours of department notification of the invalidation decision. The sample must be analyzed for the same fecal indicator using the analytical methods in 41.7(3)"c." The department 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. For an extension, the department must specify how much time the system has to collect the sample.

e. Sampling location.

(1) Any GW source sample required under 41.7(3)"a" must be collected at a location prior to any treatment of the GW source, unless the department 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 department-approved location to meet the requirements of 41.7(3)"a" if the sample is representative of the water quality of that well.

f. New sources. As directed by the department, a GW system that places a new GW source into service must conduct assessment source water monitoring, including the sampling and analysis in 41.7(3)"b"(3) to 41.7(3)"b"(6). If directed, the system must begin monitoring before the GW source is used to provide water to the public.

g. PN. A system with a GW source sample collected under 41.7(3)"a" or "b" that is fecal indicator-positive and that is not invalidated under 41.7(3)"d," including consecutive systems served by the GW source, must conduct Tier 1 PN under 567—subrule 40.5(2).

h. Monitoring violations. Failure to meet the requirements of 41.7(3)"a" through "f" is a monitoring violation that requires the system to provide Tier 3 PN under 567—subrule 40.5(4).

41.7(4) GW system TT requirements.

a. GW systems with significant deficiencies or source water fecal contamination.

(1) The TT requirements of this subrule must be met by GW systems when a significant deficiency is identified or when a GW source sample collected under 41.7(3)"a"(3) is fecal indicator-positive.

(2) If directed by the department, a GW system with a GW source sample collected under 41.7(3)"a"(2), "a"(4), or 41.7(3)"b" that is fecal indicator-positive must comply with the TT requirements of this subrule.

(3) When a significant deficiency is identified at a SW or IGW system that also uses a GW source not under the influence of SW, the system must comply with provisions of this paragraph, except in cases where the department determines that the significant deficiency is in a portion of the distribution system that is served solely by the SW or IGW source.

(4) Unless the department directs the GW system to implement a specific corrective action, the system must consult with the department regarding the appropriate corrective action within 30 days of either receiving a written department notice of a significant deficiency, written notice from a laboratory that a GW source sample collected under 41.7(3)"a"(3) is fecal indicator-positive, or direction from the department that a fecal indicator-positive sample collected under 41.7(3)"a"(2), "a"(4), or 41.7(3)"b" requires corrective action. For the purposes of this subrule, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the department determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

(5) Within 120 days, or earlier if directed by the department, of either receiving written department notification of a significant deficiency, written notice from a laboratory that a GW source sample collected under 41.7(3)“a”(3) is fecal indicator-positive, or direction from the department that a fecal indicator-positive sample collected under 41.7(3)“a”(2), “a”(4), or 41.7(3)“b” requires corrective action, the GW system must either:

1. Have completed corrective action in accordance with applicable department plan review processes or other department guidance or direction, if any, including department-specified interim measures; or
2. Be in compliance with a department-approved corrective action plan and schedule, subject to the following conditions:
 - Any subsequent modifications to a department-approved corrective action plan and schedule must also be approved by the department; and
 - If the department specifies interim measures for public health protection, pending department approval of the corrective action plan and schedule, or pending completion of the corrective action plan, the system must comply with these interim measures in addition to any department-specified schedule.

(6) Corrective action alternatives. GW systems meeting the conditions of 41.7(4)“a”(1) or “a”(2) must implement one or more of the following corrective action alternatives:

1. Correct all significant deficiencies;
2. Provide an alternate source of water;
3. Eliminate the source of contamination; or
4. Provide treatment that reliably achieves at least 4-log virus treatment for the GW source.

(7) Special PN of significant deficiencies or source water fecal contamination.

1. In addition to the Tier 1 PN requirements of 567—subrule 40.5(2), a community GW system that receives department notice of a significant deficiency or notification of a fecal indicator-positive GW source sample that is not invalidated under this rule must inform the public served by the water system of the fecal indicator-positive source sample or of any uncorrected significant deficiency, in accordance with 567—paragraph 40.7(9)“e.” The system must continue to inform the public annually until the significant deficiency is corrected or until the department determines that the fecal contamination in the GW source is corrected, in accordance with 41.7(3)“a”(5).

2. In addition to the Tier 1 PN requirements of 567—subrule 40.5(2), a noncommunity GW system that receives department notice of a significant deficiency must inform the public served by the system, in a department-approved manner, of any significant deficiency that is not corrected within 12 months of department notification or earlier if directed by the department. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

- The nature of the significant deficiency and the date it was identified by the department;
- The department-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and
- For systems with a large proportion of non-English speaking consumers, as determined by the department, information in the applicable language(s) regarding the importance of the notice, or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

3. If directed by the department, an NCWS with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under 41.7(4)“a”(7)“2.”

b. Compliance monitoring.

(1) Existing GW sources. A GW system that provides at least 4-log virus treatment must submit a request to the department to avoid the source water monitoring requirements of 41.7(3). The request must include engineering, operational, or other information that the department may need to evaluate the submission. The department must approve the request in writing before the system can avoid the GW source monitoring requirements. The system’s operation permit will include the mandatory operational requirements for the approved 4-log virus treatment. If the system subsequently discontinues 4-log virus treatment or no longer wishes to be exempt, the system must conduct GW source monitoring as required under 41.7(3).

(2) New GW sources. A GW system that places a GW source in service that is not required to meet the source water monitoring requirements of this subrule because it provides at least 4-log virus treatment for the GW source must comply with the following requirements:

1. The system must notify the department in writing that it provides at least 4-log virus treatment for the GW source. The department notification must include engineering, operational, or other information that the department requests to evaluate the submission. The contact time values for virus inactivation using free chlorine, chlorine dioxide, and ozone are in 567—Chapter 43, Appendix C. No CT table is provided for chloramines and total chlorine as the CT values would be prohibitively high for GW systems.

2. The system must conduct compliance monitoring under 41.7(4) “b”(3) within 30 days of placing the source in service.

3. The system must conduct GW source monitoring under 41.7(3) if it subsequently discontinues 4-log virus treatment for the GW source.

(3) Monitoring requirements. A GW system subject to 41.7(4) “a,” 41.7(4) “b”(1), and “b”(2) must monitor the effectiveness and reliability of treatment for that GW source before or at the first customer as follows:

1. Chemical disinfection. A GW system must monitor the residual disinfectant concentration, using analytical methods specified in 567—subparagraph 43.5(4) “a”(4), at a department-approved location and must record the lowest residual disinfectant concentration each day that water from the GW source is served to the public. A GW system must maintain the department-determined minimum residual disinfectant concentration every day the GW system serves water from the GW source to the public.

- A GW system serving more than 3,300 people must monitor continuously. If there is a failure in the continuous monitoring equipment, the system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

- A GW system serving 3,300 or fewer people must take a daily grab sample during the hour of peak flow or at another department-specified time. If any daily grab sample measurement falls below the department-determined minimum residual disinfectant concentration, the system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the department-determined minimum level. Alternatively, a GW system that serves 3,300 or fewer people may monitor continuously and meet the requirements of 41.7(4) “b”(3) “1,” first bulleted paragraph.

2. Membrane filtration. A GW system using membrane filtration to meet the requirements of this paragraph to provide at least 4-log virus treatment must monitor and operate the membrane filtration process in accordance with all department-specified monitoring and compliance requirements. A GW system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log virus removal when:

- The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log virus removal;

- The membrane process is operated in accordance with department-specified compliance requirements; and

- The integrity of the membrane is intact.

3. Alternative treatment. A GW system using a department-approved alternative treatment to meet the requirements of 41.7(4) “b” by providing at least 4-log virus treatment must:

- Monitor the alternative treatment in accordance with all department-specified monitoring requirements; and

- Operate the alternative treatment in accordance with all compliance requirements that the department determines to be necessary to achieve at least 4-log virus treatment.

- c. *Discontinuing treatment.* A GW system may discontinue 4-log virus treatment for a GW source if the department determines in writing that 4-log virus treatment is no longer necessary for that GW source. A system that discontinues 4-log virus treatment is subject to 41.7(3).

- d. *Monitoring violation.* Failure to meet the monitoring requirements of 41.7(4) “b” is a monitoring violation and requires the GW system to provide Tier 3 PN under 567—subrule 40.5(4).

41.7(5) *GW system TT violations.* A GW system must give Tier 2 PN under 567—subrule 40.5(3) for the TT violations specified in this subrule.

a. Significant deficiency. A GW system with a significant deficiency is in violation of the TT requirement if, within 120 days (or earlier if directed by the department) of receiving written department notice of the significant deficiency, the system:

- (1) Does not complete corrective action in accordance with any applicable department plan review processes or other department direction, including department-specified interim measures; or
- (2) Is not in compliance with a department-approved corrective action plan and schedule.

b. Fecal indicator-positive source sample. Unless the department invalidates a fecal indicator-positive GW source sample under 41.7(3)“d”(1), a GW system is in violation of the TT requirement if, within 120 days (or earlier if directed by the department) of meeting the conditions of 41.7(4)“a”(1) or “a”(2), the system:

- (1) Does not complete corrective action in accordance with any applicable department plan review processes or other department direction, including department-specified interim measures; or
- (2) Is not in compliance with a department-approved corrective action plan and schedule.

c. Failure to maintain 4-log treatment. A GW system subject to 41.7(4)“b”(3) that fails to maintain at least 4-log virus treatment for a GW source is in violation of the TT requirement if the failure is not corrected within four hours of the determination that the system is not maintaining at least 4-log virus treatment before or at the first customer.

41.7(6) *GW system reporting and recordkeeping.*

a. Reporting. In addition to meeting the requirements of 567—subrule 40.8(1), GW systems must provide the following information to the department:

(1) A GW system conducting compliance monitoring under 41.7(4)“b” must provide notification any time it fails to meet any of the requirements for 4-log virus treatment including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. Notification must be provided as soon as possible but in no case later than the end of the next business day.

(2) Notification of action completion, within 30 days of completing any corrective action under 41.7(4)“a.”

(3) If a GW system subject to 41.7(3)“a” does not conduct source water monitoring under 41.7(3)“a”(5)“2,” the system must provide documentation within 30 days of the total coliform-positive sample that it met the department’s criteria.

b. Recordkeeping. In addition to the requirements in 567—40.9(455B), GW systems must maintain the following information for the specified time period:

- (1) Documentation of corrective actions must be kept for not less than ten years.
- (2) Documentation of PN required under 41.7(4)“a”(7) must be kept for not less than three years.
- (3) Records of decisions under 41.7(3)“a”(5)“2” and records of fecal indicator-positive GW source sample invalidation under 41.7(3)“d”(1) must be kept for not less than five years.

(4) For consecutive systems, documentation of notification to the wholesale system(s) of total coliform-positive samples that are not invalidated under 41.2(1)“d” must be kept for not less than five years.

(5) Systems, including wholesale systems, required to perform compliance monitoring under 41.7(4)“b”(1), must maintain the following records:

1. The department-specified minimum disinfectant residual must be kept for not less than ten years.
2. Both the lowest daily residual disinfectant concentration and the date and duration of any failure to maintain the department-prescribed minimum residual disinfectant concentration for more than four hours must be kept for not less than five years.

3. Department-specified compliance requirements for membrane filtration, department-specified parameters for department-approved alternative treatment, and the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours must be kept for not less than five years.