

3745-81-43      **Ground water rule - compliance monitoring requirements for ground water systems.**

(A) Compliance monitoring.

- (1) A ground water system that is not required to meet the source water monitoring requirements of rule 3745-81-42 of the Administrative Code because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source shall comply with the following requirements:
  - (a) The system shall notify the director in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source. Notification to the director shall include engineering, operational, or other information that the director requests to evaluate the submission. The notification may also require a complete plan approval application in accordance with Chapter 3745-91 of the Administrative Code.
  - (b) The system shall obtain acceptance or approval from the director for 4-log treatment of viruses.
  - (c) The system shall conduct compliance monitoring as required in paragraph (A)(2) of this rule within thirty days of placing the source in service or receiving director approval for 4-log treatment of viruses.
  - (d) The system shall conduct ground water source monitoring in accordance with rule 3745-81-42 of the Administrative Code if the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a director-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.
- (2) Monitoring requirements. A ground water system subject to the requirements of paragraph (A)(1) of this rule or requirements in rule 3745-81-61 of the Administrative Code, shall monitor the effectiveness and reliability of treatment for that ground water source before or at the first customer as follows:
  - (a) Chemical disinfection.
    - (i) For a system providing disinfection treatment only, the disinfection treatment shall be considered sufficient if the total treatment processes of that public water system would consistently and reliably achieve at least 99.99 per cent (4-log) inactivation of viruses, as determined from tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the Administrative Code.
    - (ii) Treatment technique requirements are used to ensure control of viruses in drinking water. Tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the

Administrative Code shall be used to determine the sufficiency of disinfection for this rule.

- (iii) The level of disinfection being provided by the system is determined by measuring actual CT values. Actual CT values are obtained by multiplying the residual disinfectant, C, by the disinfection contact time, T, giving the resultant, CT. The value of C in milligrams per liter is determined at a point before or at the first customer. The value of T in minutes is based on the time available for the disinfectant to work from the point at which it is added to the water until the point at which C is measured. Values of T are determined based on the approved effective volume factor of the clearwell or contact tank including T for the conduit before the first customer. It may be appropriate to determine the value of C at more than one point of the water treatment flow, with the T associated with each C being estimated from the previous measurement point or the previous addition of disinfectant, whichever is closer. If more than one disinfectant concentration point is used, the products of each C and its associated T are added and the sum of these products is the actual CT value to compare with the appropriate value of the required minimum CT values for specified conditions and levels of inactivation. Note that any disinfection after the last determination of C is not included in the actual CT value. Minimum required CT values for inactivation of viruses by disinfection in relation to the disinfectant, the extent of inactivation, the lowest disinfectant concentration, the pH, and the water temperature are found in tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the Administrative Code.
- (iv) In tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the Administrative Code, the required CT between the indicated temperatures, pH or residual disinfectant concentrations may be determined by linear interpolation. If no interpolation is used, then the required CT shall be determined at the lower temperature, and at the higher pH. If no interpolation is used, for virus inactivation at a pH greater than nine, the required CT shall be the same as the required CT at a pH equal to ten.
- (v) On each day when the actual CT value meets or exceeds the required minimum CT value in or linearly interpolated from tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the Administrative Code, then the water treatment plant is considered to be satisfying this rule's treatment technique requirements for disinfection of ground water sources. On each day when the actual CT value does not meet or exceed the required minimum CT value from tables B-7, B-9, B-11 and B-13 of rule 3745-81-72 of the Administrative Code, then the water treatment plant is in violation of paragraph (A)(2)(a)(i) of this rule if the CT value is not restored within four hours.
- (vi) For each clearwell, or contact tank, the approved effective volume factor shall be determined by the director based upon its design characteristics including: the average flow path length to channel width ratio; baffling; and the proximity of the outlet to the inlet using figures B-1 and B-2 of rule

3745-81-72 of the Administrative Code. The approved effective volume factor shall be the preliminary effective volume factor obtained from figure B-1 multiplied by the reduction factor obtained from figure B-2, rounded down to the nearest 0.05. A public water system may request that the director approve an effective volume factor that was determined by tracer studies, hydraulic analysis or modeling, or an equivalent demonstration. For a tracer study to be acceptable, the net advection of the tracer shall be within ten per cent of the change in the tracer chemical storage within the clearwell system. Net advection means the amount of tracer convected out of the clearwell system minus the amount of tracer convected into the clearwell system over the duration of the tracer study.

- (vii) Public water systems serving greater than three thousand three hundred people shall continuously monitor the residual disinfectant concentration of the water at a location approved by the director and the lowest value shall be recorded each day. If there is a failure in the continuous disinfectant monitoring equipment, the public water system shall conduct grab sampling every four hours in lieu of continuous monitoring until the continuous monitoring equipment is repaired and returned to service. A public water system has no more than five days after failure of the equipment to repair the continuous monitoring equipment and return it to service.
  - (viii) Public water systems serving three thousand three hundred or fewer people shall monitor the residual disinfectant concentration at a location approved by the director, and record the residual disinfection concentration each day that water from the ground water source is served to the public. The public water system shall take a daily grab sample during the hour of peak flow or at another time specified by the director. If the actual residual disinfectant concentration value falls below the required minimum specified by the director, the ground water system shall take follow-up samples every four hours until the actual disinfectant residual is restored to the director-determined minimum value. Alternatively, a ground water system that serves three thousand three hundred or fewer people may monitor continuously and meet the requirements of paragraph (A)(2)(a)(vii) of this rule.
  - (ix) Other parameters necessary to determine the sufficiency of disinfection prior to the first customer shall be measured and recorded.
- (b) Membrane filtration. A ground water system that uses membrane filtration to meet the requirements of this subpart shall monitor the membrane filtration process in accordance with all director-specified monitoring requirements and shall operate the membrane filtration in accordance with all director-specified compliance requirements. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when the following conditions exist:
- (i) The membrane has an absolute molecular weight cut-off or an alternate

parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses.

- (ii) The membrane process is operated in accordance with director-specified compliance requirements.
  - (iii) The integrity of the test is intact.
- (c) Alternative treatment. A ground water system that uses a director-approved alternative treatment to meet the requirements of this rule by providing at least 4-log treatment of viruses (using inactivation, removal, or a director-approved combination of 4-log virus inactivation and removal) before or at the first customer shall comply with the following:
- (i) Monitor the alternative treatment in accordance with all director-specified monitoring requirements.
  - (ii) Operate the alternative treatment in accordance with all compliance requirements that the director determines to be necessary to achieve at least 4-log treatment of viruses.
- (B) Discontinuing treatment. A ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a director-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source if the director determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements in rule 3745-81-42 of the Administrative Code.
- (C) Failure to meet the monitoring requirements of paragraph (A) of this rule is a monitoring violation and requires the ground water system to provide public notification in accordance with rule 3745-81-32 of the Administrative Code.

Effective: 04/01/2016

Five Year Review (FYR) Dates: 01/15/2016 and 04/01/2021

Promulgated Under: 119.03  
Statutory Authority: 6109.04  
Rule Amplifies: 6109.03, 6109.04  
Prior Effective Dates: 10/31/10