**Section 611.1009 Disinfection Profiling and Benchmarking Requirements: Developing the Disinfection Profile and Benchmark**

a) A supplier required to develop disinfection profiles under Section 611.1008 must follow the requirements of this Section. The supplier must monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for Giardia lamblia and viruses. If the supplier monitors more frequently than weekly, the monitoring frequency must be evenly spaced. A supplier that operates for fewer than 12 months per year must monitor weekly during the period of operation. A supplier must determine log inactivation for Giardia lamblia through the entire plant, based on the applicable CT99.9 values in Appendix B. A supplier must determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the Agency by a SEP.

b) A supplier with a single point of disinfectant application prior to the entrance to the distribution system must conduct the monitoring in subsections (b)(1) through (b)(4). A supplier with more than one point of disinfectant application must conduct the monitoring in subsections (b)(1) through (b)(4) for each disinfection segment. A supplier must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Section 611.531.

1) For a supplier using a disinfectant other than UV, the temperature of the disinfected water must be measured at each residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the Agency by a SEP.

2) For a supplier using chlorine, the pH of the disinfected water must be measured at each chlorine residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the Agency by a SEP.

3) The disinfectant contact times (t) must be determined during peak hourly flow.

4) The residual disinfectant concentrations (C) of the water before or at the first customer and prior to each additional point of disinfectant application must be measured during peak hourly flow.

c) In lieu of conducting new monitoring under subsection (b), a supplier may elect to meet the following requirements:

1) A supplier that has at least one year of existing data that are substantially equivalent to data collected under the provisions of subsection (b) may use these data to develop disinfection profiles as specified in this Section if the supplier has neither made a significant change to its treatment practice nor changed sources since the data were collected. The supplier may develop disinfection profiles using up to three years of existing data.

2) A supplier may use disinfection profiles developed under Section 611.742 or Section 611.953 in lieu of developing a new profile if the supplier has neither made a significant change to its treatment practice nor changed sources since the profile was developed. A supplier that has not developed a virus profile under Section 611.742 or Section 611.953 must develop a virus profile using the same monitoring data on which the Giardia lamblia profile is based.

d) A supplier must calculate the total inactivation ratio for Giardia lamblia, as specified in subsections (d)(1) through (d)(3).

1) A supplier using only one point of disinfectant application may determine the total inactivation ratio for the disinfection segment based on either of the following methods:

A) It may determine one inactivation ratio (Ai) before or at the first customer during peak hourly flow; or

B) It may determine successive Ai values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. The supplier must calculate the total inactivation ratio by determining Ai for each sequence and then adding the Ai values together to determine the total inactivation ratio (Σ Ai).

2) A supplier using more than one point of disinfectant application before the first customer must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The Ai value of each segment and Σ Ai must be calculated using the method in subsection (d)(1)(B).

3) The supplier must determine the total logs of inactivation by multiplying the value calculated in subsection (d)(1) or (d)(2) by 3.0.

4) The supplier must calculate the log of inactivation for viruses using a protocol approved by the Agency by regulation or by a SEP.

e) A supplier must use the following procedures to calculate a disinfection benchmark:

1) For each year of profiling data collected and calculated under subsections (a) through (d), the supplier must determine the lowest mean monthly level of both Giardia lamblia and virus inactivation. A supplier must determine the mean Giardia lamblia and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly Giardia lamblia and virus log inactivation by the number of values calculated for that month.

2) The disinfection benchmark is the lowest monthly mean value (for a supplier with one year of profiling data) or the mean of the lowest monthly mean values (for a supplier with more than one year of profiling data) of Giardia lamblia and virus log inactivation in each year of profiling data.

BOARD NOTE: Derived from 40 CFR 141.709 (2016).

(Source: Amended at 43 Ill. Reg. 8206, effective July 26, 2019)