**Section 611.953 Disinfection Profile**

a) Applicability. A disinfection profile is a graphical representation of a system's level of Giardia lamblia or virus inactivation measured during the course of a year. A Subpart B community or non-transient non-community water system that serves fewer than 10,000 persons must develop a disinfection profile unless the Agency, by a SEP, determines that a profile is unnecessary. The Agency may approve the use of a more representative data set for disinfection profiling than the data set required under subsections (c) through (g).

b) Determination That a Disinfection Profile Is Not Necessary. The Agency may only determine that a disinfection profile is not necessary if the system's TTHM and HAA5 levels are below 0.064 mg/ℓ and 0.048 mg/ℓ, respectively. To determine these levels, TTHM and HAA5 samples must have been collected during the month with the warmest water temperature, and at the point of maximum residence time in the distribution system. The Agency may, by a SEP, approve the use of a different data set to determine these levels if it determines that the data set is representative TTHM and HAA5 data.

c) Development of a Disinfection Profile. A disinfection profile consists of the following three steps:

1) First, the supplier must collect data for several parameters from the plant, as discussed in subsection (d), over the course of 12 months;

2) Second, the supplier must use this data to calculate weekly log inactivation as discussed in subsections (e) and (f); and

3) Third, the supplier must use these weekly log inactivations to develop a disinfection profile as specified in subsection (g).

d) Data Required for a Disinfection Profile. A supplier must monitor the following parameters to determine the total log inactivation using the analytical methods in Section 611.531, once per week on the same calendar day, over 12 consecutive months:

1) The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

2) If a supplier uses chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

3) The disinfectant contact times ("T") during peak hourly flow; and

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

e) Calculations Based on the Data Collected. The tables in Appendix B must be used to determine the appropriate CT99.9 value. The supplier must calculate the total inactivation ratio as follows, and multiply the value by 3.0 to determine log inactivation of Giardia lamblia:

1) If the supplier uses only one point of disinfectant application, it must determine either of the following:

A) One inactivation ratio (CTcalc/CT99.9) before or at the first customer during peak hourly flow; or

B) Successive CTcalc/CT99.9 values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the supplier must calculate the total inactivation ratio by determining CTcalc/CT99.9 for each sequence and then adding the CTcalc/CT99.9 values together to determine ΣCTcalc/CT99.9.

2) If the supplier uses more than one point of disinfectant application before the first customer, it must determine the CTcalc/CT99.9 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 using the procedure specified in subsection (e)(1)(B).

f) Use of Chloramines, Ozone, or Chlorine Dioxide as a Primary Disinfectant. If a supplier uses chloramines, ozone, or chlorine dioxide for primary disinfection, the supplier must also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using methods approved by the Agency.

g) Development and Maintenance of the Disinfection Profile in Graphic Form. Each log inactivation serves as a data point in the supplier's disinfection profile. A supplier will have obtained 52 measurements (one for every week of the year). This will allow the supplier and the Agency the opportunity to evaluate how microbial inactivation varied over the course of the year by looking at all 52 measurements (the supplier's disinfection profile). The supplier must retain the disinfection profile data in graphic form, such as a spreadsheet, which must be available for review by the Agency as part of a sanitary survey. The supplier must use this data to calculate a benchmark if the supplier is considering changes to disinfection practices.

BOARD NOTE: Derived from 40 CFR 141.530 through 141.536.

(Source: Amended at 44 Ill. Reg. 6996, effective April 17, 2020)