**Section 611.742 Disinfection Profiling and Benchmarking**

a) Determination of a Supplier Required to Profile. A PWS supplier subject to this Subpart R must determine its TTHM annual average under subsection (a)(1) and its HAA5 annual average under subsection (a)(2). The annual average is the arithmetic average of the quarterly averages from four consecutive quarters of monitoring.

1) The supplier must use the TTHM annual average during the same period as the HAA5 annual average.

A) A supplier that collected data under 40 CFR 141 Subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under former 40 CFR 141.42 (1995).

B) A supplier using "grandfathered" HAA5 occurrence data under subsection (a)(2)(B) must use TTHM data it collected at the same time under former Section 611.680.

C) A supplier using HAA5 occurrence data under subsection (a)(2)(C)(i) must use TTHM data it collected at the same time under the provisions of Section 611.310 and former Section 611.680.

2) The HAA5 annual average the supplier uses must be the annual average during the same period as the TTHM annual average.

A) A supplier that collected data under the provisions of 40 CFR 141 Subpart M (Information Collection Rule) must use the results of the samples it collected during the last four quarters of required monitoring under former 40 CFR 141.42 (1995).

B) A supplier that collected four quarters of HAA5 occurrence data meeting the routine monitoring sample number and location requirements for TTHM in former Section 611.680 and handling and analytical method requirements of former Section 611.685 may use that data to determine whether this Section applies.

C) A supplier that has not collected four quarters of HAA5 occurrence data complying with either subsection (a)(2)(A) or (a)(2)(B) must do either of two things:

i) Conduct monitoring for HAA5 meeting the routine monitoring sample number and location requirements for TTHM in former Section 611.680 and handling and analytical method requirements of former Section 611.685 to determine the HAA5 annual average and whether subsection (b) applies; or

ii) Comply with all other provisions of this Section as if the supplier had conducted the HAA5 monitoring and the results required the supplier to comply with subsection (b).

3) The supplier may request that the Agency approve a more representative annual data set than the data set under subsection (a)(1) or (a)(2) for determining applicability of this Section.

4) The Agency may require a supplier to use a more representative annual data set than the data set under subsection (a)(1) or (a)(2) for determining applicability of this Section.

5) This subsection (a)(5) corresponds with 40 CFR 141.172(a)(5), an implementing provision that no longer has operative effect. This statement maintains structural consistency with the corresponding federal rules.

6) Any supplier that had either a TTHM annual average ≥ (greater than or equal to) 0.064 mg/L or an HAA5 annual average ≥ 0.048 mg/L under subsections (a)(1) and (a)(2) must comply with subsection (b).

BOARD NOTE: Former Sections 611.680 and 611.685 originally derived from 40 CFR 141.30(a), (b), and (e). USEPA removed 40 CFR 141.30 in its entirety in 2006. The Board repealed former Section 611.685 in 2007 and Section 611.680 in 2012. The references to former Sections 611.680 and 611.685 in this subsection (a) relate to using existing monitoring data collected under those provisions as they existed before their repeal.

b) Disinfection Profiling

1) Any supplier complying with subsection (a)(6) was to develop a disinfection profile of its disinfection practice for a period of up to three years. The Agency was to determine the period of the disinfection profile, with a minimum period of one year.

2) The supplier must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the appropriate CT99.9 values in Appendix B through the entire treatment plant. As a minimum, the supplier applying disinfection treatment at a single point before the entry point to its distribution system was to conduct the monitoring under subsections (b)(2)(A) through (b)(2)(D). A supplier applying disinfection treatment at more than one point in its distribution system was to conduct the monitoring under subsections (b)(2)(A) through (b)(2)(D) for each disinfection segment. The supplier was to monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in Section 611.531:

A) The supplier was to measure the temperature of the disinfected water once per day at each residual disinfectant concentration sampling point during peak hourly flow.

B) If the supplier uses chlorine, the supplier was to measure the pH of the disinfected water once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

C) The supplier was to determine the disinfectant contact times ("T") for each day during peak hourly flow.

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

3) This subsection (b)(3) corresponds with 40 CFR 141.172(b)(2)(A), a provision relating to implementation of the Interim Enhanced Surface Water Treatment Rule. This statement maintains structural consistency with the corresponding federal rule.

4) The supplier must calculate the total inactivation ratio:

A) A supplier using only one point of disinfectant application may determine the total inactivation ratio for its disinfection segment under subsection (b)(4)(A)(i) or (b)(4)(A)(ii).

i) The supplier may determine one inactivation ratio (CTcalc/CT99.9) before or at the first customer during peak hourly flow; or

ii) The supplier may determine successive CTcalc/CT99.9 values, representing sequential inactivation ratios, between the point where applying disinfectant and a point before or at the first customer during peak hourly flow. Under this alternative, the supplier must calculate the total inactivation ratio (**∑** (CTcalc/CT99.9)) by determining CTcalc/CT99.9 for each step in the sequence, then summing the CTcalc/CT99.9 values for each step to determine **∑** (CTcalc/CT99.9).

B) A supplier applying disinfection treatment at more than one point before the first customer must determine the CT value of each disinfection segment during peak hourly flow immediately prior to the next point where applying or before or at the first customer for the final segment. The supplier must calculate the (CTcalc/CT99.9) value of each segment and (**∑**(CTcalc/CT99.9)) using the method in subsection (b)(4)(A).

C) The supplier must determine the total logs of inactivation by multiplying the value calculated under subsection (b)(4)(A) or (b)(4)(B) by 3.0.

5) A supplier using chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using an Agency-approved method.

6) The supplier must maintain disinfection profile data in graphic form, as a spreadsheet or in some other format acceptable to the Agency, for review as part of sanitary surveys the Agency conducts.

c) Disinfection Benchmarking

1) A supplier that must develop a disinfection profile under the subsections (a) and (b) deciding to significantly change its disinfection practice must obtain Agency approval before making the change. Certain changes are significant changes to disinfection practice:

A) A change in the point where the supplier applies disinfection treatment;

B) A change in the disinfectant the supplier uses in its treatment plant;

C) A change in the supplier's disinfection process; and

D) Any other modification the Agency identifies as a significant change in a SEP.

2) Any supplier modifying its disinfection practice must calculate its disinfection benchmark using the procedure in subsections (c)(2)(A) and (c)(2)(B).

A) For each year of profiling data a supplier collects and calculates under subsection (b), the supplier must determine the lowest average monthly Giardia lamblia inactivation in each year of profiling data. The supplier must determine the average Giardia lamblia inactivation for each calendar month for each year of profiling data by dividing the sum of daily Giardia lamblia of inactivation by the number of values calculated for that month.

B) The disinfection benchmark is the lowest monthly average value (for a supplier with one year of profiling data) or average of lowest monthly average values (for a supplier with more than one year of profiling data) of the monthly logs of Giardia lamblia inactivation in each year of profiling data.

3) A supplier using chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using an Agency-approved method.

4) The supplier must submit the information in subsections (c)(4)(A) through (c)(4)(C) to the Agency when seeking Agency approval.

A) A description of the proposed change;

B) The disinfection profile for Giardia lamblia (and viruses if necessary) under subsection (b) and benchmark as subsection (c)(2) requires; and

C) An analysis of how the proposed change will affect the current levels of disinfection.

BOARD NOTE: This Section derives from 40 CFR 141.172.

(Source: Amended at 47 Ill. Reg. 16486, effective November 2, 2023)