

179 NAC 13 Attachment 1

Minimum Detectable Residuals

- A. The following requirements establish the minimum allowable disinfectant residuals for each type of system.
1. For systems that are utilizing surface water sources, or sources determined to be groundwater under the direct influence of surface water, one of the following options must be implemented to meet the minimum residual requirements.
 - a. 0.2 ppm residual for free chlorine or 0.5 ppm for total chlorine or
 - b. 0.1 ppm residual for free chlorine or 0.25 ppm for total chlorine provided the requirements in Section C items 1-5 of this attachment are met or
 - c. HPC of <500 cfu/ml.
 2. All groundwater systems serving water to the public that contains chlorine or chloramines as a chemical disinfectant or oxidant on a continuous basis must use one of the following criteria for minimum residuals.
 - a. 0.1 ppm residual for free chlorine or
 - b. 0.05 ppm for free chlorine if qualifying criteria in section C items 3-5 of this attachment are met or
 - c. HPC of <500 cfu/ml.
- B. If a system is required to disinfect under an Administrative Order (AO), the requirements listed in the AO will supersede any requirements for minimum residuals established in this attachment.
- C. In order for a system to maintain the lower minimum residual requirement for free or total chlorine (referred to in A, items 1.b. and 2.b.), the following criteria must be met:
1. Any public water system using surface water or ground water under the direct influence of surface water must meet or exceed all CT inactivation requirements in 179 NAC 13., Tables 13.1 to 13.8 at all times through the treatment process in order to utilize the lower requirements of A, item 1.b.
 2. Any public water system using surface water, or ground water determined to be under the direct influence of surface water, must maintain effluent turbidity levels of less than or equal to 0.3 NTU in 95% of all readings, and at no time exceed 1 NTU.

- A system may submit a study to the Department showing that turbidity values in excess of the specified turbidity limits are a direct result of the treatment process and do not represent a threat to public health. The Department will review the study to determine the nature of the high turbidity levels and if they pose a threat to public health.
3. The system must demonstrate that the field test method being used can consistently, reliably, and precisely measure residuals less than or equal to the specified limit being used.
 4. The system must document that the manufacturer's recommendations for calibration or standardization are being done according to manufacturer's specifications and frequency, and make this information available for review during sanitary surveys.
 5. The system must demonstrate that there is no interference with the testing method, or document that interference has been corrected for. This can be done by any one of the following methods:
 - a. Demonstration through historical source water data (a minimum of 12 months of data, or at least four quarterly samples for non-transient non-community systems) that no interference listed under the manufacturer's instructions is present in the system.
 - b. Sampling for applicable interferences once each day that a residual disinfectant compliance sample(s) is taken to obtain a correction factor to be added to all residual compliance samples taken that day.
 - c. Using an EPA approved method that provides a correction for interference as part of the procedure, and documenting all corrections.
 - d. Adjusting all results based on stable historical data and adding the maximum interference obtained, with the Department's approval.
- D. Disinfectant residuals must be at or above the required minimum residual limits in at least 95% of all distribution residuals taken for the month. If the system fails to meet the 95% requirement for two consecutive months, or for > 50% of the previous 12 consecutive months, the system will be deemed to be in violation of prescribed treatment techniques and will be issued a Treatment Technique violation.

179 NAC 13 Attachment 1

I. ~~Minimum Detectable Residuals~~

- A. ~~The following requirements establish the minimum allowable disinfectant level that is to be carried through the far end of the distribution system for each type of system.~~
1. ~~For systems that are utilizing surface water sources, or sources determined to be groundwater under the direct influence of surface water, one of the following options must be implemented to meet the minimum residual requirements. The residual must be sampled a minimum of five days per week, at the far end of the distribution system. If the Department makes a determination that a problem exists in the distribution system, based upon consistently abnormal disinfectant residuals or Heterotrophic Plate Counts (HPCs), the monitoring frequency may be increased to seven days per week.~~
 - a. ~~0.2 ppm residual for free chlorine or 0.5 ppm for total chlorine or~~
 - b. ~~0.1 ppm residual for free chlorine or 0.25 ppm for total chlorine provided the requirements in Section ID 1-5 of this attachment are met or~~
 - c. ~~HPC of <500 cfu/ml.~~
 2. ~~All groundwater systems serving water to the public that contains chlorine or chloramines as a chemical disinfectant or oxidant on a continuous basis must use one of the following criteria for minimum residuals. For these systems sampling is required a minimum of 5 days per week at the far end of the distribution system. If the Department makes a determination that a problem exists in the distribution system, based upon consistently abnormal disinfectant residuals or HPCs, the monitoring frequency can be increased to seven days per week.~~
 - a. ~~0.1 ppm residual for free or total chlorine or~~
 - b. ~~0.05 ppm for free or total chlorine if qualifying criteria in section ID 3-5 of this attachment are met or~~
 - c. ~~HPC of <500 cfu/ml.~~
- B. ~~The Department may for cause (public health) require any ground water system that adds chlorine or chloramines to maintain the minimum residuals described in Section IA, Item 1 of this attachment.~~
- C. ~~If a system is required to disinfect under an Administrative Order (AO), the requirements listed in the AO will supercede any requirements for minimum residuals established in this attachment.~~
- D. ~~In order for a system to maintain the lower minimum residual requirement for free or total chlorine at the far end of the distribution system (referred to in IA, Items 1b and 2b.), the following criteria must be met:~~
1. ~~Any public water system using surface water or ground water under the direct influence of surface water must meet or exceed all CT inactivation requirements in 179 NAC 2-013, Tables 13.1 to 13.8 at all times through the treatment process in order to utilize the lower requirements of IA, Items 1b and 2b.~~

- ~~2. Any public water system using surface water, or ground water determined to be under the direct influence of surface water, must maintain effluent turbidity levels of less than or equal to 0.3 NTU in 95% of all readings, and at no time exceed 1 NTU. A system may submit a study to the Department showing that turbidity values in excess of the specified turbidity limits are a direct result of the treatment process and do not represent a threat to public health. The Department will review the study to determine the nature of the high turbidity levels and if they pose a threat to public health.~~
- ~~3. The system must demonstrate that the field test method being used can consistently, reliably, and precisely measure residuals less than or equal to the specified limit being used.~~
- ~~4. The system must document that the manufacturer's recommendations for calibration or standardization are being done according to manufacturer's specifications and frequency, and make this information available for review during sanitary surveys.~~
- ~~5. The system must demonstrate that there is no interference with the testing method, or document that interference has been corrected for. This can be done by any one of the following methods:
 - ~~a. Demonstration through historical data that no interference such as dissolved manganese or oxygen are present in the system.~~
 - ~~b. Sampling for an individual interference a minimum of three times weekly at the far end of the distribution system. Samples must be taken on separate days a minimum of 24 hours apart and results documented. Sampling results must be averaged together to provide a correction factor for all samples taken that week.~~
 - ~~c. Using an EPA approved method that provides a correction for interference as part of the procedure, and documenting all corrections.~~~~
- ~~E. If continuous monitoring is used at the far end of the distribution system, the lowest value recorded each day must be the residual reported for that day. In the event of a power failure or mechanical breakdown, daily grab samples must be taken in lieu of continuous monitoring until the problem has been corrected and continuous monitoring is once again operational.~~
- ~~F. Sampling for distribution system residuals must still occur each time a bacteriological sample is taken. In addition to disinfectant residuals taken in conjunction with bacteriological samples, distribution residual sampling described in section IA of this attachment will also be required. If a bacteriological sample were taken at a site representative of the far end of the distribution system, further testing as described in sections IA-C would not be required. All residuals and HPC(s) are to be reported to the Department no later than the 10th of each month for the preceding month.~~
- ~~G. Disinfectant residuals must be at or above the required minimum residual limits in at least 95% of all distribution residuals taken for the month. If the system fails to meet the 95% requirement for two consecutive months, or for $\geq 50\%$ of the previous 12 consecutive months, the system will be deemed to be in violation of prescribed treatment techniques and will be issued a Treatment Technique violation.~~