



Turbidity in Drinking Water: A Guide for Tennessee Municipal Elected Officials

Part 2 of a 6 Part Series

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What is turbidity in drinking water?

Turbidity is a measure of how murky or cloudy water appears. The unit of measurement used in Tennessee is Nephelometric Turbidity Units (NTU). The suspended material in the water which cause the turbidity can interfere with the disinfection process and allow harmful pathogens to hide within the suspended material.

A large portion of the processes that occur at a water treatment plant are done to reduce the turbidity of the water along with removal of dissolved contaminants. Chemicals are added to the source water as it enters the treatment process. Based upon the quality of the source water these chemicals could be:

- Chemicals to adjust the pH of the water
- Coagulants
- Flocculants

These chemicals take time and slow mixing to work properly. As the contaminants form larger particles they may settle out in the low flow sedimentation basins prior to the filters. The filters are the last barrier to remove the contaminants which cause turbidity.

These processes also aid in reducing pathogens entering the water distribution system. They act as a physical barrier to stop the pathogens.

Tennessee Department of Environment and Conservation, Division of Water Resources Rule 0400-45-01 lists the regulations and definitions regarding turbidity in drinking water.

Turbidity is checked in the source water entering the treatment plant daily, at various stages of treatment such as on the top of the filters, leaving each filter and the finished water as it is pumped into the distribution system. The water leaving each filter is monitored continuously and the results are recorded. TDEC Rule 0400-45-01-.31 (6) (b) 4 lists the requirements for monitoring, record keeping and triggers for individual filters. If a filter exceeds the limits of this rule, then an individual filter turbidity exceedance report must be submitted to TDEC.

TDEC Rule 0400-45-01-.31 (5) (c) is very specific about monitoring requirements of the combined filtered water.

Bench-top and continuous turbidimeters must be verified and calibrated per TDEC Rule 0400-45-01-.17 (40) and (41).

Below are some excerpts from the Rule:

0400-45-01-.04 (9) “Coagulation” means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerate into flocs.

0400-45-01-.04(35) “Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

0400-45-01-.04 (38) “Filtration” means a process for removing particulate matter from water by passage through a porous media.

0400-45-01-.04 (41) “Flocculation” means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

0400-45-01-.04 (88) “Sedimentation” means a process for removal of solids before filtration by gravity or separation.

Below is a section showing the maximum level for sub part H systems.

0400-45-01-.31 (4) Filtration (c) 1. For systems using conventional or direct filtration, the turbidity level of representative samples of a systems filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurement taken each month, measured as specified in sub paragraphs (5) (a) and (c) of this rule.

Source

Rules of Tennessee Department of Environment and Conservation. Division of Water Resources. Chapter 0400-45-01.

<https://publications.tnsosfiles.com/rules/0400/0400-45/0400-45-01.20190217.pdf>



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