



Microbiological Issues Within a Water System: A Guide for Tennessee Municipal Elected Officials

Part 3 of a 6 Part Series

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The water system's purpose is to provide safe and plentiful water to their customers. A major issue is protection from harmful microorganisms. The Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources [Rule 0400-45-01](#) specifies what a water system must do to protect the consumer.

A water system has multiple methods that are used in dealing with microbes.



1. The water treatment plant with its processes to reduce turbidity along with filtration is a physical barrier to stop the introduction of microbes into the water distribution system.
2. TDEC requires that chlorine is added to the water to act as a disinfectant for the water as it flows through the distribution system and customers plumbing. There are set limits on the amount of chlorine which may be in the water.
3. Positive pressure is also used to keep microbes from the system. If there is a break in a line, the positive pressure within the line will reduce the chance of microbes entering the system.
4. New lines, tanks and other infrastructure must be disinfected and tested for contamination prior to being put into service.
5. Flushing is a means to maintain an adequate chlorine level within the system.
6. Cross connection devices are also part of the struggle to keep microbes out of the system.
7. Sealed water wells that prevent surface runoff from entering the wells.
8. Overall good housekeeping by staff.

The water system is required to test for **coliform bacteria** on a monthly basis at the plant and within the distribution system. Coliform bacteria are used as an indicator of possible pathogens. The number of samples is based upon population served. If a sample is positive for coliform it is also checked for Escherichia coli. If these are present in a sample at a specified level it will trigger a required response that the system. That would include repeat monitoring and assessments.

Cryptosporidium are extremely small microbes which are resistant to chlorine. Surface water systems and ground water systems under the influence of surface water must sample their source water for this microbe per TDEC. Based upon the results of the sampling the system will be assigned a Bin. Each Bin has specific language that the system would have to follow to protect the consumers.



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