



How will the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) affect my system?

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What is the Interim Enhanced Surface Water Treatment Rule (IESWTR), and how is it different from the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR)?

The IESWTR applies only to systems serving 10,000 or more people. The LT1ESWTR, first introduced in January 2002, is the small system counterpart of the IESWTR. The primary differences between the LT1ESWTR and the IESWTR are that the LT1ESWTR regulates smaller systems, and it has later compliance dates. All public systems that serve fewer than 10,000 people and use surface water or groundwater under the direct influence of surface water (GWUDI) must comply with this rule.

The LT1ESWTR reinforces microbial controls and prevents a significant increase in microbial risks where small systems must take steps to implement the Stage 1 Disinfectants and Disinfection Byproducts Rule (DBPR). This rule is a balancing act between creating too many disinfection byproducts and making sure there is enough disinfection for microbial control (eliminating pathogens such as *Cryptosporidium* and *Giardia lamblia*).

Implementation of the IESWTR for systems with 10,000 or more people is already well under way, and these systems need to continue to meet the requirements of the IESWTR. According to the U.S. Environmental Protection Agency (EPA), the LT1ESWTR is expected to apply to more than 11,000

systems serving nearly 18.5 million Americans. EPA is considering how to modify some large system requirements to make them more appropriate for small systems.

What are some of the LT1ESWTR requirements?

The LT1ESWTR provisions fall into four categories:

Category 1: Cryptosporidium Removal

The maximum contaminant level goal (MCLG) is set at zero. All systems that filter their water must physically remove 99 percent of *Cryptosporidium*. Unfiltered systems must update and improve their watershed control programs to minimize the potential of *Cryptosporidium* contamination. *Cryptosporidium* is now to be included as an indicator of GWUDI.

Category 2: Enhanced Filtration Requirements

The specific combined filter effluent turbidity requirements depend upon which type of filtration the system uses. Conventional and direct filtration requirements should be less than or equal to 0.3 nephelometric turbidity units (NTU) in at least 95 percent of the measurements taken each month, and the maximum level of turbidity should never exceed 1 NTU.

Also, conventional and direct filtration systems must constantly monitor the turbidity of individual filters. If there are only two filters, then the combined filter

effluent has to be monitored relentlessly. Slow sand and diatomaceous earth (DE) filtration requirements must continue to meet combined filter effluent turbidity limits specified in the surface water treatment rule, which are less than or equal to 1 NTU in at least 95 percent of measurements taken each month. The maximum level of turbidity should never exceed 5 NTU.

For alternative technologies (other than conventional, direct, slow sand, or DE filtration), the system's primacy agency establishes required turbidity levels based upon filter demonstration data that the system collects and submits. At a minimum, the primacy agency's limits must not exceed 1 NTU in at least 95 percent of the measurements taken each month or a maximum level of turbidity of 5 NTU.

Category 3: Microbial Inactivation Benchmarking

Systems will be required to develop a profile of microbial inactivation levels (contact time [CT] calculations) unless they perform early monitoring that demonstrates disinfection byproducts levels that are less than 80 percent of the maximum contaminant level (MCL) established in the Stage 1 DBPR. Also, systems considering a significant change to their disinfection practices must determine their current lowest level of microbial inactivation and consult with their regulatory agency (usually the state) for approval prior to implementing the change.

Category 4: Other Requirements

The rule also requires that all newly constructed, finished-water reservoirs be covered, which includes reservoirs for which construction began 60 days after January 14, 2002.

In addition, unfiltered systems must comply with updated watershed control requirements.

What are the benefits of LT1ESWTR?

The LT1ESWTR increases health protection against gastrointestinal illnesses from *Cryptosporidium* and other pathogens through improvements in filtration. In addition, EPA estimates that the rule will reduce the likelihood of endemic illness from *Cryptosporidium* by an estimated 12,000 to 41,000 cases annually. With the reduced number of potential illnesses that EPA expects, the savings

in health care and prescription drugs could be \$18.9 to \$90.9 million per year.

Operators also will be better equipped to optimize their systems with the procedures used to implement the LT1ESWTR. Continuous monitoring of filter water turbidity and disinfection profiling and benchmarking are tools operators can use to improve the quality of water sent to their customers. Anything that helps operators do their jobs benefits everyone. In my opinion, the water operator holds one of the most important positions in the community.

How much will LT1ESWTR cost my water system?

Well, to be sure, there will be some costs for nearly all systems when implementing this rule. Most of the cost will be associated with monitoring and reporting, such as the continuous tur-

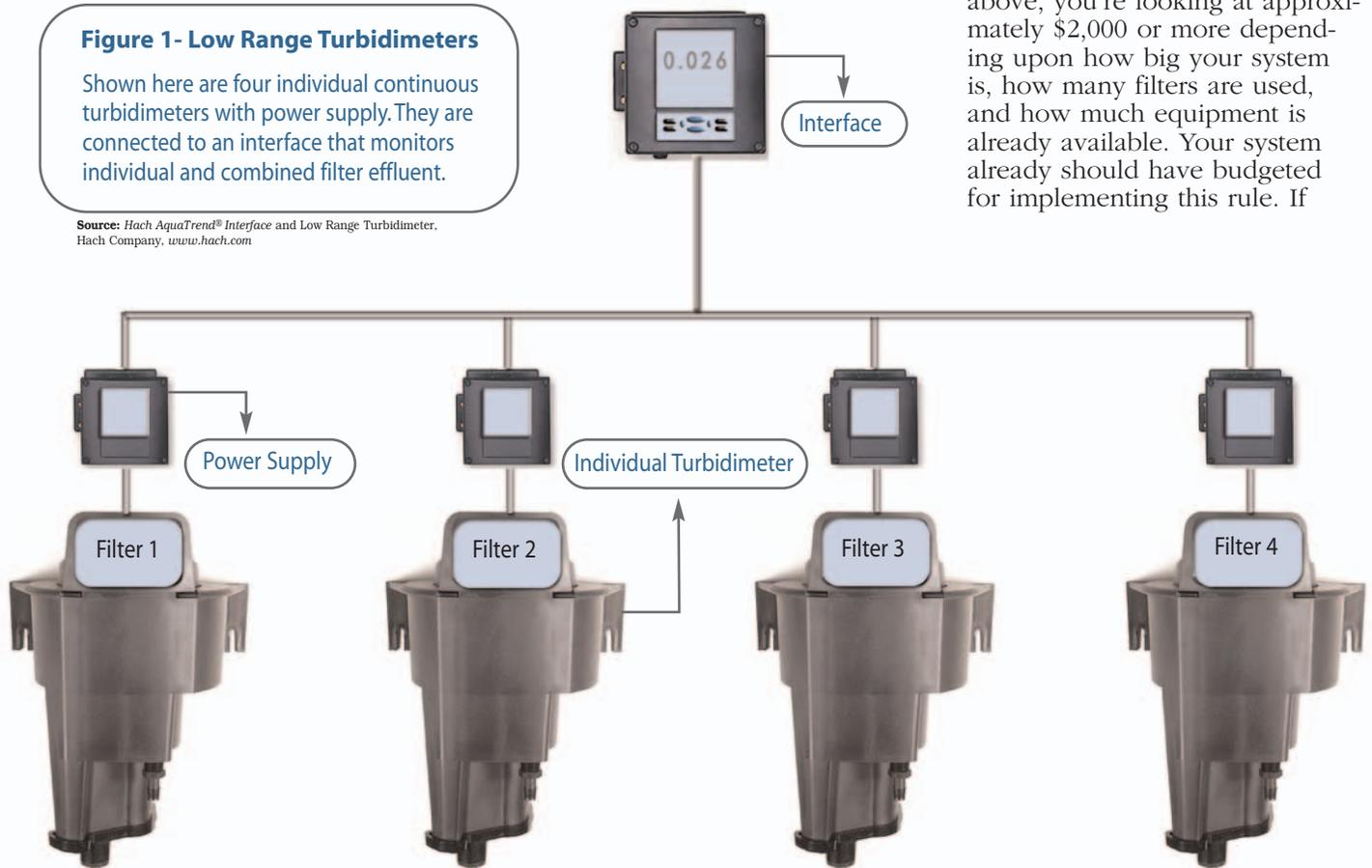
bidimeter needed to monitor the individual (if more than two) and/or combined filter effluent. Also, computer software or a chart recorder (if acceptable by your regulatory agency) will be needed to keep records of turbidity data. Some package plants or filters are constructed so that it's not possible to install the continuous turbidimeter on each filter to perform this monitoring, such as the Greenleaf Filter Plant or certain automatic backwash filters. EPA has stated that these can be considered one filter. If you believe that your system falls under this category, you will need to consult with your state primacy agency because it can trump EPA and set its own rules.

If your water plant does not already have a computer that is able to handle the software, then you need to get one to record and store the turbidity data. Just as with the equipment listed above, you're looking at approximately \$2,000 or more depending upon how big your system is, how many filters are used, and how much equipment is already available. Your system already should have budgeted for implementing this rule. If

Figure 1- Low Range Turbidimeters

Shown here are four individual continuous turbidimeters with power supply. They are connected to an interface that monitors individual and combined filter effluent.

Source: Hach AquaTrend® Interface and Low Range Turbidimeter, Hach Company, www.hach.com



you haven't, it's not too late to start. Also, don't forget the maintenance costs of the turbidimeter, which will need to be calibrated on a regular basis.

EPA estimates that "the nationwide annual cost of the rule will be \$39.5 million. Approximately 84 percent (\$33.1 million) of the rule's total annual costs are imposed on drinking water utilities. States incur the remaining 16 percent (\$6.4 million annually) of the LT1ESWTR's total annual cost."

The average annual cost to residential water customers is estimated at \$6.24 per year. Ninety percent of residential water customers will experience costs of less than \$15 per year, and fewer than one percent of residential water customers are estimated to incur annual costs of greater than \$120 per year; however, this is a conservative estimate because systems with fewer water customers are more likely to choose cheaper alternatives to implement improvements. If managed right, your water system will not only be in compliance with the new rule, but it also will improve water quality, making the money well spent.

What funding is available to help my water systems comply with this rule?

The drinking water state revolving loan fund is available to provide low-interest (usually around one percent to three percent) loans to help systems improve their infrastructure. Other federal funds for offered infrastructure improvements are through the U.S. Department of Housing and Urban Development's Community Development Block Grant Program and the U. S.

Department of Agriculture's Rural Utilities Service. EPA also provides funding to states that have enforcement responsibility for their drinking water systems through the Public Water Systems Supervision grants program.

Remember: When you get the money and are finally able to hire an engineer and contractor, you are the boss—these people work for you. Make them do a good job and hold their feet to the fire. Quality control must be adhered to at the highest standard. The water system is ultimately responsible for the money.

How soon will the changes take effect?

The rule was effective as of February 14, 2002; however, each of the requirements has a different compliance date. The applicable dates are as follows:

As of March 15, 2002, construction of uncovered finished (treated) water reservoirs was prohibited.

As of July 1, 2003, systems serving between 500-9,999 people must report to their primacy agency (usually the state) the results of optional monitoring that shows levels of total trihalomethanes (TTHM) less than 0.064 milligrams per liter (mg/L) and haloacetic acids (HAA5) less than 0.048 mg/L.

As of January 1, 2004, systems serving fewer than 500 people must report to their primacy agency the results of optional monitoring that show levels of total trihalomethanes (TTHM) less than 0.064 mg/L and haloacetic acids (HAA5) less than 0.048 mg/L.

Starting June 30, 2004, systems serving between 500-9,999 people must complete their disinfection profiles unless their primacy agency has determined it to be unnecessary.

Starting December 31, 2004, systems serving fewer than 500 people must complete their disinfection profiles unless their primacy agency has determined it unnecessary.

Starting January 14, 2005, surface water systems or GWUDI systems serving fewer than 10,000 people must comply with LT1ESWTR provisions such as turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, and unfiltered systems must update watershed control requirements. 

References:

- U. S. Environmental Protection Agency. *Microbial and Disinfection Byproduct Rules, Existing Rules, Long Term 1 Enhanced Surface Water Treatment Rule* available at www.epa.gov/OGWDW/mdbp/mdbp.html#ieswtr.
- U. S. Environmental Protection Agency. *Final Long Term 1 Enhanced Surface Water Treatment Rule Fact Sheet* available at www.epa.gov/ogwdw000/mdbp/lt1eswtr_fact.html.
- U. S. Environmental Protection Agency. *Long Term 1 Enhanced Surface Water Treatment Rule: A Quick Reference Guide*.

Zane Satterfield came to the National Drinking Water Clearinghouse from the West Virginia Bureau of Public Health, where he worked as a system inspector. He also has worked for the Fairmont, West Virginia, Engineering office, gaining valuable experience with water and wastewater treatment.



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