

LT2ESWTR

By Jeff Swanson

That just says it all – doesn't it? We are surrounded by acronyms where ever we go. Does anyone remember a company called Kentucky Fried Chicken? Or is it faster and easier just to say "KFC"? Well, I must say that when it comes to some of the newest rules handed down by EPA (another one!!), the acronym LT2ESWTR or Long Term 2 Enhanced Surface Water Treatment Rule, is certainly easier to remember and understand than the subject matter that comprised it. In a past article, I wrote about the Stage 2 Disinfection By-Products or ST2DBPs. These two rules actually go hand in hand.

The U.S. Environmental Protection Agency (EPA) published the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) on January 5, 2006. The LT2ESWTR improves control of microbial pathogens. The LT2ESWTR requires source water monitoring at public water systems (PWSs) that use surface water or ground water under the direct influence of surface water (GWUDI). Based on system size and filtration type, systems need to monitor for *Cryptosporidium*, *E. coli*, and turbidity.

The purpose of the rule has to do with source water monitoring. Pathogens, such as *Giardia* and *Cryptosporidium*, are often found in surface water, and can cause gastrointestinal illness (e.g., diarrhea, vomiting, cramps) and other health risks. *Cryptosporidium* is a significant concern in drinking water because it contaminates surface waters used as drinking water sources, it is resistant to chlorine and other disinfectants, and it has caused waterborne disease outbreaks. Consuming water with *Cryptosporidium*, a contaminant in drinking water sources, can cause gastrointestinal illness, which may be severe in people with weakened immune systems (e.g., infants and the elderly) and sometimes fatal in people with severely compromised immune systems (e.g., cancer and AIDS patients).

Current regulations require filtered water systems to reduce source water *Cryptosporidium* levels by 99 percent (2-log). Recent data on *Cryptosporidium* indicate that this treatment is sufficient for most

systems, but additional treatment is necessary for certain higher risk systems. These higher risk systems include filtered water systems with high levels of *Cryptosporidium* in their water sources and all unfiltered water systems, which do not treat for *Cryptosporidium*.

Systems initially monitor their water sources to determine treatment requirements. This monitoring involves two years of monthly sampling for *Cryptosporidium*. To reduce monitoring costs, small filtered water systems will first monitor for *E. coli*—a bacterium that is less expensive to analyze than *Cryptosporidium*—and will monitor for *Cryptosporidium* only if their *E. coli* results exceed specified concentration levels.

Treatment: Filtered water systems will be classified in one of four treatment categories (bins) based on their monitoring results. Most systems are expected to be classified in the lowest bin and will face no additional requirements. Systems classified in higher bins must provide additional water treatment to further reduce *Cryptosporidium* levels by 90 to 99.7 percent (1.0 to 2.5-log), depending on the bin. Systems will select from different treatment and management options in a "microbial toolbox" to meet their additional treatment requirements. All unfiltered water systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of *Cryptosporidium*, depending on the results of their monitoring.

Uncovered Finished Water Reservoirs: Systems that store treated water in open reservoirs must either cover the reservoir or treat the reservoir discharge to inactivate 4-log virus, 3-log *Giardia lamblia*, and 2-log *Cryptosporidium*. These requirements are necessary to protect against the contamination of water that occurs in open reservoirs.

Disinfection Benchmarking: Systems must review their current level of microbial treatment before making a significant change in their disinfection practice. This review will assist systems in maintaining protection against microbial pathogens as they take steps to reduce the formation of disinfection byproducts under the Stage 2 Disinfection Byproducts Rule, which EPA is finalizing along with the LT2ESWTR.

Monitoring starting dates are staggered by system size. The largest systems (serving at least 100,000 people) began monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly.

The LT2ESWTR will improve the control of *Cryptosporidium* and other microbiological pathogens in drinking water systems with the highest risk levels. EPA estimates that full compliance with the LT2ESWTR will reduce the incidence of cryptosporidiosis - the gastrointestinal illness caused by ingestion of *Cryptosporidium* - by 89,000 to 1,459,000 cases per year, with an associated reduction of 20 to 314 premature deaths. The additional *Cryptosporidium* treatment requirements of the LT2ESWTR will also reduce exposure to other microbial pathogens, such as *Giardia*, that co-occur with *Cryptosporidium*. Additional protection from microbial pathogens will come from provisions in this rule for reviewing disinfection practices and for covering or treating uncovered finished water reservoirs, though EPA has not quantified these benefits.

In conclusion, the goals remain the same. Reducing the threat of microbial contamination in water supplies is crucial. When I mentioned that these two rules go ‘hand in hand’, it is to say that there is a direct correlation between filtration (LT2SWTR) and disinfection (ST2DBPR). To provide a means of plant optimization may mean the utilization of “enhanced coagulation”. Depending on the type of “plant” your system has, you may find that the utilization of the “bin classification” process and subsequent selection of various treatment possibilities from your “microbial toolbox” will help meet the requirements in the ever-changing rules. Better treatment and process control help reduce not only the turbidity, but the microbial levels and organic carbon levels as well. Better filtration will help reduce the necessary levels of chlorine needed for disinfection. Lower levels of chlorine residuals will aid in reduced levels of disinfection byproducts.

Being acronym challenged these days is always tricky – understanding some of the new rules they represent – even worse. As our smaller systems prepare for the 2008 deadlines, feel free to call for help. Remember that some of these new rules are not being administered by our state agency at this time, but directly by the EPA. You may wish to contact: Wendy Marshall, EPA Region 10, Seattle, WA @ 206-553-1890.