

LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE FACT SHEET

What is the purpose of the rule?

Improve public health protection through the control of microbial contaminants by focusing on systems with elevated *Cryptosporidium* risk.

Who does this rule apply to?

The Long Term Enhanced Surface Water Treatment Rule (LT2ESWTR) applies to all public water systems (systems) that use surface water or ground water under the direct influence of surface water. There are approximately 82 systems in Connecticut that will be impacted by the LT2ESWTR. Thirty-seven (37) of these systems will be impacted by the early implementation activities of the LT2ESWTR.

What are the requirements of the rule?

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 (serving <10,000) will first monitor for *E. coli*—a bacterium that is less expensive to analyze than *Cryptosporidium*—and will only monitor for *Cryptosporidium* 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.

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 has finalized along with the LT2ESWTR.

How soon after publishing the final rule will the changes take effect?

Monitoring starting dates are staggered by system size as depicted in the table below. The largest systems (serving at least 100,000 people) will begin 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.

Source Water Monitoring

System Serving	Schedule	Source Monitoring Begin Date (First Round)	Source Monitoring Begin Date (Second Round)
100,000 or more people	1	10/1/2006	4/1/2015
50,000 to 99,999	2	4/1/2007	10/1/2015
10,000 to 49,999	3	4/1/2008	10/1/2016
fewer than 10,000	4	10/1/2008	10/1/2017

Where can I find information on contacting a laboratory to analyze my monitoring samples?

An updated list of laboratories that are approved by EPA’s Laboratory Quality Assurance Program and will accept commercial samples is available on the [EPA website](http://www.epa.gov/safewater/disinfection/lt2/index.html) (<http://www.epa.gov/safewater/disinfection/lt2/index.html>).

What are the Source Water Monitoring Requirements under the LT2ESWTR?

Systems using surface water or GWUDI are required to monitor their source water (i.e., the influent water entering the treatment plant) monthly for 24 months to determine an average *Cryptosporidium* level. As described in the next section, monitoring results determine the extent of *Cryptosporidium* treatment requirements under the LT2ESWTR. Large systems (>10,000) must also monitor for *E. coli* and turbidity in source water. Filtered systems are not required to conduct source water monitoring if the system will provide a total of at least 5.5-log of treatment for *Cryptosporidium*.

The rule provides a schedule for the submission of a sampling plan, conducting sampling, and submission of a report. Systems must adhere to the sampling plan and report results no later than 10 days after the end of the second month following the month when the sample is collected. All systems serving at least 10,000 people must report the results from the initial source water monitoring to EPA electronically to the Data Collection Tracking System (DCTS) at the [LT2 Data Collection System Website](https://intranet.epa.gov/lt2/) (<https://intranet.epa.gov/lt2/>).

Will grandfathered data be accepted?

Submission of historical (grandfathered) data is possible when it meets requirements specified in the rule. Systems must report that they intend to submit previously collected results for grandfathering no later than three (3) months prior to the applicable source water monitoring begin date. All previously collected results for grandfathering and associated documentation must be reported no later than two (2) months after the applicable source water monitoring begin date. The table below summarizes these requirements:

Schedule	Source Water Monitoring Begin Date	Sampling Schedule / Intent to Grandfather Due Date	Proposed Grandfathered Documentation Due Date
1	10/1/2006	7/1/2006	12/1/2006
2	4/1/2007	1/1/2007	6/1/2007
3	10/1/2007	7/1/2007	12/1/2006

The rule also includes a second round of *Cryptosporidium* sampling for all systems. This second round of sampling will take place six years following bin classification and is also staggered by system size.

What are the Sampling Requirements under the LT2ESWTR?

Filtered systems serving at least 10,000 people must sample their source water for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 months. Filtered systems serving fewer than 10,000 people must sample their source water for *E. coli* at least once every two weeks for 12 months. Filtered systems serving fewer than 10,000 people must sample their source water for *Cryptosporidium* at least twice per month for 12 months or at least monthly for 24 months if the system does not conduct *E. coli* monitoring or if the initial *E. coli* sample exceed the following criteria:

For systems using lake/reservoir sources, the annual mean *E. coli* concentration is greater than 10 *E. coli*/100 mL.

For systems using flowing stream sources, the annual mean *E. coli* concentration is greater than 50 *E. coli*/100 mL.

Specific rule provisions address sources and/or treatment facilities that are not used year round, blended sources, and other complex situations. Specific requirements for many of these complex situations will need to be discussed with the primacy agency.

Systems must collect samples within a five-day period around the schedule date unless specific conditions exist. If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample, the system must sample as close to the scheduled date as is feasible unless the state approves an alternative sampling date. The system must submit an explanation for the delayed sampling date to the state concurrent with the shipment of the sample to the laboratory. If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements, or the failure of an approved laboratory to analyze the sample, then the system must collect a replacement sample.

Replacement samples should be collected no later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the system demonstrates that collecting a replacement sample within this time frame is not feasible or the state approves an

alternative re-sampling date. The system must submit an explanation for the delayed sampling date to the state concurrent with the shipment of the sample to the laboratory. Systems that fail to meet these criteria for any source water sample must revise their sampling schedules to add dates for collecting all missed samples. Systems must submit the revised schedule to the state for approval prior to when the system begins collecting the missed samples.

How do I choose Source Water Monitoring Locations?

Systems must collect samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the state may approve one set of monitoring results to be used for all plants. In most cases, sampling will be conducted at the locations currently used for Connecticut's raw water monitoring requirements.

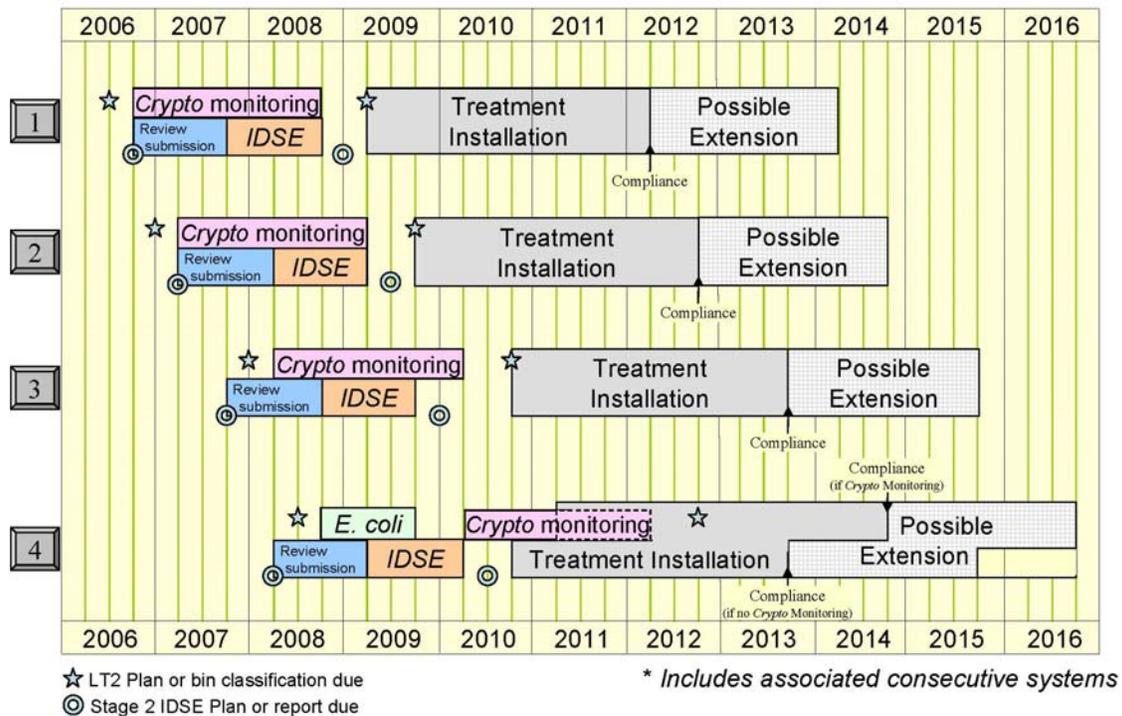
Systems must collect source water samples prior to chemical addition, such as coagulants, oxidants and disinfectants. The state may approve a system to collect a source water sample after chemical treatment. To grant this approval, the state must determine that collecting a sample prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample. Systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition. Specific requirements are included from bank filtration and other special cases.

A system that begins using a new source of surface water or GWUDI after the system is required to begin monitoring under paragraph (c) of this section must monitor the new source on a schedule the state approves.

What are the Monitoring and Treatment Compliance Dates?

Starting dates for monitoring are staggered by system size, with smaller systems beginning monitoring after larger systems. Milestones for monitoring, reporting, and compliance occur first for very large systems ($\geq 100,000$ persons), then systems serving 50,000 - 99,999 persons, followed by systems serving 10,000 - 49,999 persons, and finally systems serving fewer than 10,000. The entire Early Implementation Schedule for LT2ESSTR is as follows:

Implementation Schedule



How is a Bin Classification Assigned for a Filtered System?

Filtered water systems will be classified in one of four treatment categories or bins based on their monitoring results. The rule specifies several calculation procedures depending on how many samples were collected or if the sample frequency was not consistent.

Calculating Bin Placement

- Total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.
- Total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.
- For systems that serve fewer than 10,000 people and monitor for *Cryptosporidium* for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.
- For systems with plants operating only part of the year that monitor fewer than 12 months per year under § 141.701(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

If the monthly *Cryptosporidium* sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification.

How Treatment Requirements are related to Bin Classification?

Systems classified in higher treatment bins must provide 1.0 to 2.5-log additional treatment for *Cryptosporidium*. Systems will select from a wide range of treatment and management strategies in the "microbial toolbox" to meet their additional treatment requirements. Systems classified in Bin 3 and Bin 4 must achieve at least 1 log of additional treatment using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or ultraviolet (UV) light.

What's a Microbial Toolbox and how it works?

PWSs can achieve additional *Cryptosporidium* treatment credit through implementing pretreatment processes, such as presedimentation or bank filtration, by developing a watershed control program, and by applying additional treatment steps like ozone, chlorine dioxide, UV, and membranes. In addition, PWSs can receive a higher level of credit for existing treatment processes through achieving very low filter effluent turbidity or through a demonstration of performance. Taken as a whole, this list of control options is termed the "microbial toolbox." PWSs may use one or more tools to accumulate the needed treatment credits to meet the treatment requirement associated with their bin classification. To assure adequate treatment is achieved on an ongoing basis, each treatment option has specific operational requirements and/or reporting requirements. Some treatment options like "demonstration of performance" do not have a prescribed level of treatment credit, but provide the opportunity for a utility to conduct studies to illustrate the removal it is achieved.

Do I get any Credits for Using UV Light?

Systems receive *Cryptosporidium*, *Giardia lamblia*, and virus treatment credits for ultraviolet (UV) light reactors by achieving the UV dose values described in the rule's UV Dose Table. Systems must validate and monitor UV reactors to demonstrate that they are achieving a particular UV dose value for treatment credit. UV reactor validation must occur at full-scale using a test microbe with quantified dose-response characteristics using low-pressure mercury lamps. Validation must include operating conditions of flow rate, UV intensity as measured by a UV sensor, and UV lamp status, as well as other considerations including as lamp fouling and inlet/outlet hydraulics.

To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose.

Do I have to do Microbial Profiling and Benchmarking?

Following the completion of initial source water monitoring (date varies by system size), a system that plans to make a significant change to its disinfection practice, must develop disinfection profiles and calculate disinfection benchmarks for *Giardia lamblia* and viruses.

Significant changes to disinfection practice are defined as follows:

- (1) Changes to the point of disinfection;
- (2) Changes to the disinfectant(s) used in the treatment plant;
- (3) Changes to the disinfection process; or
- (4) Any other modification identified by the state as a significant change to disinfection practice.

Are there any special reporting requirements?

EPA has established the Information Processing and Management Center (IPMC) as a centralized location for Source Water Monitoring Submissions. The IPMC will receive, sort, scan, and perform data entry for LT2 submissions into the Data Collection and Tracking System (DCTS). The following table from EPA's [Source Water Monitoring Guidance Manual for Public Water Systems for the Final Long Term 2 Enhanced Surface Water Treatment Rule](#) summarizes the reporting options available:

Submitting Reports and Notices Options for Submitting Reports and Notices			
Report/Notice	E mail	Hardcopy	DCTS
Sampling Schedule *			X
Sample Location Description	X	X	
Intent to Provide Maximum Treatment		X	
Intent to Grandfather Data	X	X	
Grandfathered Data	X	X	X
Grandfathered Data Supporting Documentation	X	X	
Initial Round Monitoring Data *			X

* Sampling schedules and Initial Round monitoring data must be submitted through the DCTS unless EPA or State approve an alternative means [40 CFR §141.702(a)(2) and 40 CFR § 141.706(b)]. If the schedule is not submitted through the DCTS by the required date, you may not be able to use the DCTS to input your schedule and should call your point-of-contact as indicated on the contact list at <http://www.epa.gov/safewater/disinfection/lt2/compliance.html> for assistance).

Depending on the option chosen, reports and notices should be submitted as follows:

Via email to: stage2mdbp@epa.gov

Hardcopies mailed to: US EPA - IPMC
P.O. Box 98
Dayton, OH 45401

Submissions through the LT2/Stage 2 Data Collection and Tracking System (DCTS):

Access the DCTS through the LT2 web site at
<http://www.epa.gov/safewater/disinfection/tools/index.html>

How the EPA and the State of Connecticut intend to implement this Rule?

Given that certain aspects of this Rule are in effect prior to the time the State can adopt the Rule into its regulations, the State and EPA agreed to partner in the implementation of the rule during this period. The partnership agreement assigns to the State the following functions, while EPA will handle and oversee the remaining aspects:

- 1) Review grandfathered data, including data quality, sampling schedules and locations, and notify systems of acceptance of this data.
- 2) Track all grandfathered systems and the systems who opt to waive all monitoring requirements and install the highest level of treatment utilizing the LT2/Stage 2 data collection system.
- 3) Follow up with systems whose grandfathered data was not accepted.
- 4) Review reported sampling schedules and sampling location descriptions. Follow up with systems whose planned schedules and/or locations are insufficient.
- 5) Review and follow up on systems' challenges to monitor results and utilizing the LT2/Stage 2 data collection system.
- 6) Review bin classifications as reported by systems and notify systems of their approval.
- 7) Perform along with EPA all data management and compliance tracking using the LT2/Stage 2 data collection system.

Who is my Contact on this Rule?

In the State of Connecticut, Christopher Roy is the coordinator of this Rule and can be reached at 860-509-7333 or christopher.roy@po.state.ct.us.

Disclaimer: Connecticut credits EPA and AWWA for most of the information on this fact sheet

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