

# **DRAFT FOR COMMENT**



## **The Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) Implementation Guidance**

draft

### ***Disclaimer***

This document provides guidance to states, tribes, and U.S. Environmental Protection Agency (EPA) Regions exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) and contains EPA's current policy recommendations for complying with the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). Throughout this document, the terms "state" or "states" are used to refer to all types of primacy agencies including U.S. territories, Indian tribes, and EPA Regions.

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The general description provided here may not apply to a particular situation based upon the circumstances. Interested parties are free to raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation. EPA and other decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from those described in this guidance where appropriate.

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This is a living document and may be revised periodically without public notice. EPA welcomes public input on this document at any time. Guidance provided in this draft document reflects provisions proposed on August 11, 2003 (68 *FR* 47640).

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## **List of Acronyms and Abbreviations**

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CAFO	Concentrated Animal Feeding Operation
CCR	Consumer Confidence Report
CDC	Centers for Disease Control
CFE	Combined Filter Effluent
CFR	Code of Federal Regulations
CT	The Residual Concentration of Disinfectant (mg/L) Multiplied by the Contact Time (in minutes)
CWS	Community Water System
DBPs	Disinfection Byproducts
EPA	U.S. Environmental Protection Agency
FBRP	Filter Backwash Recycling Rule
FEMA	Federal Emergency Management Agency
FRDS	Federal Reporting Data System
GAC	Granular Activated Carbon
GWUDI	Ground Water Under the Direct Influence of Surface Water
HAA5	Haloacetic Acids (Monochloroacetic, Dichloroacetic, Trichloroacetic, Monobromoacetic and Dibromoacetic Acids)
HQ	Headquarters
ICR	Information Collection Rule
ICRSS	Information Collection Rule Supplemental Survey
ICRSSL	Information Collection Rule Supplemental Surveys of large systems
IDSE	Initial Distribution System Evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
IFE	Individual Filter Effluent
Log	Logarithm (common, base 10)
LRAA	Locational Running Annual Average
LT1ESWTR	Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR	Long Term 2 Enhanced Surface Water Treatment Rule
MCF	Membrane Cartridge Filter
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M-DBP	Microbial and Disinfectants/Disinfection Byproducts
MRDL	Maximum Residual Disinfection Level
M&R	Monitoring and Reporting
NCWS	Noncommunity Water System
NIPDWR	National Interim Primary Drinking Water Regulations
NPDWR	National Primary Drinking Water Regulation
NTNCWS	Nontransient Noncommunity Water System
NTU	Nephelometric Turbidity Unit
OECA	Office of Enforcement and Compliance Assurance
OGC	Office of General Counsel
OGWDW	Office of Ground Water and Drinking Water
ORC	Office of Regional Counsel
PWS	Public Water System
PWSS	Public Water System Supervision
RAA	Running Annual Average

SDWA	Safe Drinking Water Act
SDWIS/FED	Safe Drinking Water Information System/Federal
SNC	Significant Non-complier
Stage 1 DBPR	Stage 1 Disinfectants and Disinfection Byproducts Rule
Stage 2 DBPR	Stage 2 Disinfectants and Disinfection Byproducts Rule
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TOC	Total Organic Carbon
TT	Treatment Technique
TTHM	Total Trihalomethanes (Chloroform, Bromodichloromethane, Dibromochloromethane, and Bromoform)
UCMR	Unregulated Contaminant Monitoring Rule
UV	Ultraviolet Light
WCP	Watershed Control Program



## **Introduction**

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This document provides guidance to EPA regions and states exercising primary enforcement responsibility under the Safe Drinking Water Act (SDWA) concerning how the U.S. Environmental Protection Agency (EPA) interprets the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) under the SDWA. It also provides guidance to the public and the regulated community on how EPA intends to exercise its discretion in implementing the statute and regulations. This draft guidance is designed to implement national policy on these issues.

The SDWA provision and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provision or regulations, nor is it a regulation itself. It does not impose legally-binding requirements on EPA, states, or the regulated community and may not apply to a particular situation based upon the circumstances. EPA and state decision makers retain the discretion to adopt approaches on a case-by-case basis that differ from this draft guidance, where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation. EPA will then consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations. EPA may change this draft guidance in the future.

This draft manual contains the following sections:

Section 1 summarizes the rule requirements of the LT2ESWTR and presents a timetable of important dates. Section 2 lists the “stand-alone” guidance materials that will help states and public water systems (PWSs) adopt each new requirement. Section 3 discusses state implementation activities. Section 4 covers state primacy revision requirements, including a detailed time frame for application review and approval. This section also contains guidance and references to help states adopt each new special primacy requirement included in these rules. Section 5 addresses violation determination and associated reporting requirements to assist states in their compliance activities.

The appendices of this document also provide information that will be useful to states and EPA regions throughout the primacy revision application process. Appendix A contains the primacy revision application crosswalk fo the rule. Appendix B contains the rule language of the LT2ESWTR. Appendix C contains a fact sheet and a draft quick reference guide for the rule. Appendix D contains the data entry instructions for the LT2ESWTR.

Please note that, in several sections, the guidance makes suggestions and offers alternatives that go beyond the minimum requirements indicated. EPA does this to provide information and/or suggestions that may be helpful to implementation efforts. Such suggestions are prefaced by “may” or “should” and are to be considered advisory. They are not required elements of the LT2ESWTR.

EPA will undertake necessary rule implementation activities during the period of early implementation. During this period, the state may elect to undertake some or all of the implementation activities in cooperation with EPA. This will facilitate continuity of implementation and ensure that system-specific advice and decisions are made with the best available information and are consistent with existing state program requirements.

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# **Section 1**

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## **Rule Requirements**

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## 1.1 Introduction

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EPA proposed the LT2ESWTR in the *Federal Register* on August 11, 2003 (68 *FR* 47640; see <http://www.epa.gov/safewater/lt2/index.html>). This rule is part of a series of rules, the “Microbial-Disinfectants/ Disinfection Byproducts Cluster” (M-DBP Cluster), which is intended to improve control of microbial pathogens while minimizing public health risks of disinfectants and disinfection byproducts (DBPs). The LT2ESWTR does not change any of the requirements established by the Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR), or the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR); instead, it builds upon these requirements. Key provisions of the LT2ESWTR include:

- Source water monitoring for *Cryptosporidium*, with reduced monitoring requirements for small systems.
- Additional *Cryptosporidium* treatment techniques for filtered systems based on source water *Cryptosporidium* concentrations.
- Inactivation of *Cryptosporidium* for all unfiltered systems.
- Disinfection profiling and benchmarking to assure continued levels of microbial protection while PWSs take the necessary steps to comply with new DBP standards.
- Covering, treating, or implementing a risk management plan for uncovered finished water reservoirs.

EPA believes that implementation of the LT2ESWTR will significantly reduce levels of *Cryptosporidium* in finished drinking water. This will substantially lower rates of endemic cryptosporidiosis, the illness caused by *Cryptosporidium*, which can be severe and sometimes fatal in sensitive sub-populations (e.g., infants, immune suppressed patients, the elderly). In addition, the treatment technique (TT) requirements of this proposal are expected to increase the level of protection from exposure to other microbial pathogens (e.g., *Giardia*).

The LT2ESWTR has been proposed concurrently with the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR), which addresses reducing peak and average levels of disinfection byproducts in drinking water supplies. The Stage 2 DBPR was proposed as a separate rule on August 18, 2003.

### 1.1.1 History

The 1974 SDWA called for EPA to regulate drinking water by creating the national interim primary drinking water regulations (NIPDWR). In 1979, the first interim standard addressing DBPs was set for total trihalomethanes (TTHM), a group of four volatile organic chemicals that form when disinfectants react with natural organic matter in the water.

Although the SDWA was amended slightly in 1977, 1979, and 1980, the most significant changes to the 1974 law occurred when the SDWA was reauthorized in 1986. To safeguard public health, the 1986 Amendments required EPA to set health goals, or maximum contaminant level goals (MCLGs), and maximum contaminant levels (MCLs) for 83 named contaminants. Waterborne disease outbreaks of

giardiasis demonstrated that disease-causing microbial contamination had not been sufficiently controlled under the original Act. In addition, several hundred chemical contaminants were known to occur in the environment but few were regulated in PWSs. EPA was also required to establish additional regulations within certain timeframes, require disinfection of source water supplies, specify filtration requirements for nearly all water systems that draw their water from surface sources, and develop additional programs to protect ground water supplies.

In 1989, EPA issued two important National Primary Drinking Water Regulations (NPDWR): the Total Coliform Rule (TCR) and the SWTR. The TCR and SWTR provide the foundation for the M-DBP Cluster and are summarized below.

#### *Total Coliform Rule*

The TCR applies to all PWSs. Coliforms are easily detected in water and are used to assess a water system's vulnerability to pathogens. In the TCR, EPA set an MCLG of zero for total coliforms. EPA also set an MCL for total coliforms and required testing of total coliform positive cultures for the presence of *E. coli* or fecal coliforms, which indicate more immediate health risks from sewage or fecal contamination. If more than 5.0 percent of the samples contain coliforms within a month, water system operators must report this violation to the state and the public. Finally, the TCR required sanitary surveys every 5 years (or 10 years for noncommunity water systems (NCWSs) using disinfected and protected ground water) for every system that collects fewer than five routine total coliform samples per month. These are typically systems that serve less than 4,100 people.

#### *Surface Water Treatment Rule*

PWSs using surface water or ground water under the direct influence of surface water (GWUDI) as a supply are prone to microbial contamination of their source water. Pathogenic microorganisms that can contaminate source water can be removed or inactivated during the water treatment sedimentation, filtration, and disinfection processes. EPA issued the SWTR in response to a Congressional mandate requiring disinfection, and filtration where necessary, of systems that use surface water or GWUDI sources. The rule sets MCLGs for *Legionella*, *Giardia lamblia*, and viruses at zero because any exposure to these contaminants presents some level of health risk. The SWTR includes a treatment technique requirement for inactivation (or removal and inactivation) of these organisms.

Specifically, the SWTR requires that a surface water system have sufficient treatment to reduce source water concentrations of *Giardia lamblia* and viruses by at least 99.9 percent (3 log) and 99.99 percent (4 log), respectively. In addition, disinfection residuals must be maintained throughout the distribution system. For systems that filter, the adequacy of the filtration process is determined by measuring the turbidity of the treated water since high levels of turbidity often indicate that the filtration process is not working properly. The goal of the SWTR is to reduce the public health risk for infection by *Giardia lamblia*, *Legionella*, or viruses to less than one infection per year per 10,000 people.

The SWTR, however, does not account for systems with high pathogen concentrations in source water that, when treated at the levels required under the rule, still may not meet this health goal. The SWTR also does not specifically control for the protozoan *Cryptosporidium*, as sufficient information about its removal or disinfection was not available at the time the SWTR was finalized. Over the past 10 years, much has been learned about this organism. Most notably, *Cryptosporidium* is resistant to disinfection practices commonly employed by PWSs. Therefore, physical removal of *Cryptosporidium* is the most effective method for public health protection.

### *1996 SDWA Amendments*

In 1990, EPA's Science Advisory Board, an independent panel of experts established by Congress, cited drinking water contamination as one of the most important environmental risks and indicated that disease-causing microbial contaminants (e.g., bacteria, protozoa, and viruses) are probably the greatest remaining health-risk management challenge for drinking water suppliers. Data from the Centers for Disease Control (CDC) confirm this concern and indicate that between 1980 and 1998, 419 waterborne disease outbreaks were reported, with over 511,000 estimated cases of disease. During this period, a number of agents were implicated as causes of the outbreaks, including various protozoa, viruses, and bacteria, as well as several chemicals (Craun and Calderon 1996, Levy et al. 1998, Barwick et al. 2000). Most of the cases (but not the outbreaks) of illnesses were associated with surface water, including a single outbreak of approximately 403,000 cases of cryptosporidiosis in Milwaukee, WI (Mac Kenzie et al. 1994).

The SDWA was further amended in 1996 to improve public health protection by incorporating new data on the adverse health effects of contaminants, the occurrence of contaminants in PWSs, and the estimated reduction in health risks that would result from further regulation. The Amendments provided for use of best-available, peer-reviewed science in decision-making and for risk reduction and cost analyses in the regulatory decision process.

### *TTHMs/Stage 1 DBPR/Stage 2 DBPR*

Many water systems treat their water with a chemical disinfectant in order to inactivate pathogens that cause disease. The public health benefits of common disinfection practices are significant and well-recognized; however, disinfection poses risks of its own. While disinfectants are effective at controlling many harmful microorganisms, they react with organic and inorganic matter (DBP precursors) in the water and form DBPs, some of which pose health risks when present above certain levels. Since the discovery of chlorination byproducts in drinking water in 1974, numerous toxicological studies have been conducted that show some DBPs to be carcinogenic and/or cause reproductive or developmental effects in laboratory animals. Additionally, exposure to high levels of disinfectants over long periods of time may cause health problems, including damage to blood and kidneys. While many of these studies have been conducted with disinfectants at high doses, the weight of evidence indicates that DBPs present a potential public health problem that must be addressed even at low levels. One of the most complex questions facing water supply professionals is how to reduce risks from disinfectants and DBPs while providing adequate protection against microbial contaminants. Much of the population is exposed to these risks; therefore, a substantial concern exists.

The TTHM Rule of 1979 set a TTHM standard for CWSs serving 10,000 or more people. The Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) built on the TTHM Rule by lowering existing MCLs and widening the range of affected systems to include all PWSs (except most transient systems) that add a disinfectant. The Stage 1 DBPR established new MCLs for chlorite, bromate, and haloacetic acids (HAA5) as well as established maximum residual disinfection levels (MRDLs) for the disinfectants chlorine, chloramine, and chlorine dioxide. In addition, the Stage 1 DBPR requires conventional filtration systems to remove specified percentages of organic materials, measured as total organic carbon (TOC), that may react with disinfectants to form DBPs.

The Stage 2 DBPR builds upon the Stage 1 DBPR by providing more consistent protection from DBPs across the entire distribution system and by focusing on the reduction of DBP peaks. The Stage 2 DBPR changes the way sampling results are averaged to determine compliance. The determination for the Stage 2 DBPR is based on a locational running annual average (LRAA) (i.e., compliance must be met at *each*

monitoring location) instead of the system-wide running annual average (RAA) used under the Stage 1 DBPR. In addition to changes in MCL compliance calculation, systems must also conduct an initial distribution system evaluation (IDSE) to identify compliance monitoring locations that represent high TTHM and HAA5 levels. Systems are also required to conduct a significant excursion evaluation if they have DBP levels that are significantly higher than the MCL.

#### *Filter Backwash Recycling Rule*

The Filter Backwash Recycling Rule (FBRR) complements the surface water treatment rules by reducing the potential for microbial pathogens, particularly *Cryptosporidium* oocysts, to pass through the filters into the finished water of systems that use conventional and direct filtration. The FBRR requires affected systems to notify the state in writing about its recycle practices, maintain specific records, and return regulated recycle streams (i.e., spent filter backwash, thickener supernatant, or liquids from dewatering processes) through all processes of a system's conventional or direct filtration system (unless the state approves an alternate location).

#### *IESWTR/LT1ESWTR/LT2ESWTR*

The IESWTR builds on the SWTR by adding protection from *Cryptosporidium* through strengthened combined filter effluent (CFE) turbidity performance standards and individual filter effluent (IFE) turbidity provisions. The IESWTR applies to systems that serve more than 10,000 people. For unfiltered systems, *Cryptosporidium* must be included in watershed control requirements. In addition, the IESWTR builds on the TCR by requiring sanitary surveys for all PWSs using surface water or GWUDI. The IESWTR also requires covers for all new finished water storage facilities and includes disinfection profiling and benchmarking provisions to ensure systems provide continued levels of microbial protection while taking the necessary steps to comply with the DBP standards.

The provisions in the LT1ESWTR address the concerns covered by the IESWTR as they apply to small systems (i.e., systems serving fewer than 10,000 people) using surface water or GWUDI. The LT2ESWTR builds upon the SWTR, IESWTR, and LT1ESWTR by supplementing existing microbial treatment requirements for systems where additional public health protection is needed.

Collectively, the SWTR, IESWTR, LT1ESWTR, and LT2ESWTR place stringent treatment requirements on systems using surface water or GWUDI as a source.

#### *The Multiple Barrier Approach*

By building on the foundation of the original SDWA, subsequent amendments to the Act have improved the quality of drinking water and increased public health protection. The 1996 SDWA Amendments, for example, require EPA to develop rules to balance the risks presented by microbial pathogens and DBPs. The LT2ESWTR is one of the most recent rules in the M-DBP Cluster that expands on the foundation of prior rulemaking efforts.

Since multiple threats require multiple barriers, the LT2ESWTR and Stage 2 DBPR expand on the foundation of the TCR, SWTR, TTHM Rule, Stage 1 DBPR, IESWTR, LT1ESWTR, and FBRR standards to target health risks not addressed by prior regulations. By encompassing these previously unaddressed health risks from microbials and DBPs, the M-DBP Cluster continues to maximize drinking water quality and public health protection.



### 1.1.2 Development of the LT2ESWTR

In March 1999, EPA reconvened the M-DBP Advisory Committee to develop recommendations for the LT2ESWTR and Stage 2 DBPR. This committee also participated in the development of the IESWTR, LT1ESWTR, and Stage 1 DBPR. The Committee's members represented EPA, state, and local public health and regulatory agencies, local elected officials, Native American tribes, drinking water suppliers, chemical and equipment manufacturers, and public interest groups. Technical support for the Committee's discussions was provided by a technical workgroup established by the Committee at its first meeting. The Committee's activities resulted in the collection and evaluation of substantial new information related to key elements for both rules. This included new data on pathogenicity, occurrence, and treatment of microbial contaminants, specifically including *Cryptosporidium*, as well as new data on DBP health risks, exposure, and control. The Committee held ten meetings (from September 1999 to July 2000), which were open to the public, to discuss issues pertaining to the LT2ESWTR and Stage 2 DBPR. There was also an opportunity for public comment at each meeting.

In September 2000, the Committee signed the Agreement in Principle, a full statement of the consensus recommendations of the group. The agreement was published in a December 29, 2000 Federal Register notice (65 FR 83015) and includes the list of committee members and their organizations. The Committee's recommendations were incorporated into the proposed LT2ESWTR.

The M-DBP Committee reached agreement on the following major issues regarding the LT2ESWTR:

- Additional *Cryptosporidium* treatment based on source water monitoring results.
- Filtered systems that must comply with additional *Cryptosporidium* treatment requirements may choose from a "toolbox" of treatment and control options.
- Reduced monitoring burden for small systems.
- Future monitoring to confirm initial assessments of source water quality.
- *Cryptosporidium* inactivation by all unfiltered systems.
- Unfiltered systems meet overall inactivation requirements using a minimum of 2 disinfectants.
- Development of criteria and guidance for ultraviolet light (UV) disinfection and other toolbox options.
- Cover or treat existing uncovered finished water reservoirs.

The requirements of the LT2ESWTR are in addition to the requirements in previous surface water treatment rules, including SWTR, IESWTR, LT1ESWTR and FBRR.

### 1.1.3 Benefits of the LT2ESWTR

#### 1.1.3.1 Quantifiable Benefits

The LT2ESWTR is expected to reduce drinking water related exposure to *Cryptosporidium* substantially, thereby reducing both illness and death associated with cryptosporidiosis through source water monitoring, additional treatment techniques, and higher standards for drinking water quality. Cryptosporidiosis is an infection caused by *Cryptosporidium* and is an acute, typically self-limiting illness with symptoms that include diarrhea, abdominal cramping, nausea, vomiting, and fever (Juranek, 1995). Cryptosporidiosis patients in sensitive subpopulations, such as infants, the elderly, and AIDS patients, are at risk for severe illness, including risk of death. The LT2ESWTR is expected to reduce 256,000 to 1,019,000 illnesses and 37 to 141 deaths annually (on average) after full implementation (range based on the Information Collection Rule Supplemental Surveys of large systems (ICRSSL) and Information Collection Rule (ICR) data sets). Based on these values, the mean present value of benefits (annualized at a 3 percent discount rate) ranges from \$374 million to \$1.4 billion. These values do not take into account confidence limits for non-quantified benefits.

For filtered systems, benefits to the approximately 161 million people served by filtered surface water and GWUDI systems range from a mean reduction in annual cases of endemic illness ranging from 88,000 to 472,000 (based on ICRSSL and ICR data sets). In addition, deaths are expected to be reduced by an average of 9 to 50 people annually. The 12 million people served by unfiltered surface water or GWUDI systems will also see a significant reduction in cryptosporidiosis as a result of the rule. The LT2ESWTR is expected to reduce approximately 168,000 to 547,000 cases of illnesses and 28 to 91 premature deaths annually in unfiltered systems (based on ICRSSL and ICR data sets). Only the ICR data set is used to directly calculate reduced illness because it is the only data set that includes sufficient information on unfiltered systems.

#### 1.1.3.2 Non-quantifiable health and non-health related benefits

Although significant benefits will result from the LT2ESWTR in terms of the reduction in illnesses and death associated with cryptosporidiosis, other health and non-health related benefits associated with this rule remain unquantified due to lack of data. Non-quantifiable health and non-health related benefits of the LT2ESWTR include:

- Reducing outbreak risks and response costs associated with human or equipment failure.
- Reducing averting behavior (e.g., boiling tap water or purchasing bottled water).
- Improving aesthetic water quality (e.g., taste and odor).
- Reducing exposure to other parasitic protozoans that EPA regulates or is considering for future regulation (e.g., pathogenic bacteria, viruses, *Giardia lamblia*, *Cyclospora sp.*, members of the Microsporididea class, arsenic, DBPs, and atrazine).
- An increase in source water monitoring leads to a better understanding of source water quality and may enhance treatment.
- Reducing contamination of storage facilities due to covering or treating the finished water.

## 1.2 Requirements of the Rule: PWSs

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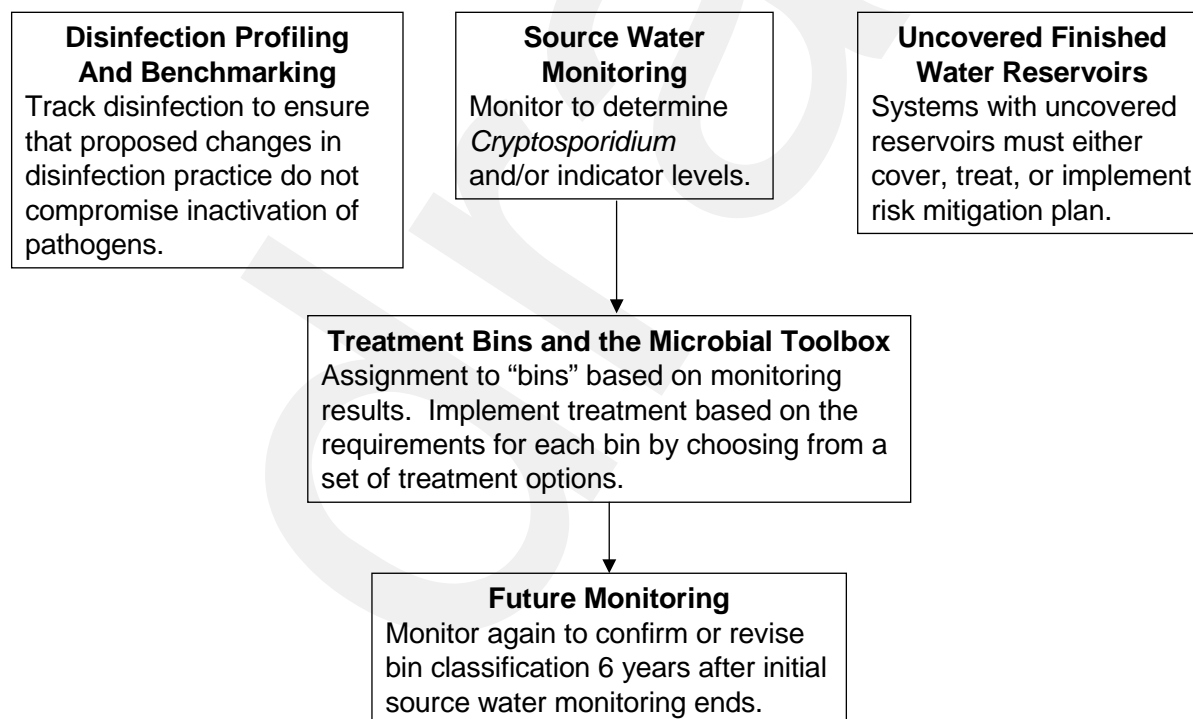
The following section provides a summary of the rule requirements. The rule requirements are from the proposed LT2ESWTR published in the *Federal Register* on August 11, 2003 (68 *FR* 47640). For a copy of the actual rule language, see Appendix B or visit EPA's Web site at [www.epa.gov/safewater/lt2/index.html](http://www.epa.gov/safewater/lt2/index.html).

### 1.2.1 General Requirements

The flowchart in Figure 1-1 shows the general requirements of the LT2ESWTR. All surface water and GWUDI PWSs, including wholesale systems, must characterize their source water to determine what, if any, additional treatment is necessary to reduce *Cryptosporidium*. Systems conduct source water monitoring to determine an average *Cryptosporidium* concentration and, based on that average, will be classified into one of four possible risk categories (bins). The LT2ESWTR also includes requirements for uncovered finished water reservoirs and disinfection profiling and benchmarking.

EPA developed the compliance schedule for monitoring, reporting, and treatment requirements with consideration of the Stage 2 DBPR compliance schedule.

**Figure 1-1. General Requirements of the LT2ESWTR**



### 1.2.2 Source Water Monitoring [proposed §141.702]

Large systems (serving at least 10,000 people) that currently provide filtration or that are unfiltered and required to install filtration must conduct source water monitoring for *Cryptosporidium*, *E. coli*, and turbidity.

Small systems (serving fewer than 10,000 people) that currently provide filtration or that are unfiltered and required to install filtration must first monitor for *E. coli* or an alternative indicator approved by the state as a screening analysis. Small systems are only required to monitor for *Cryptosporidium* if the mean *E. coli* level exceeds the following trigger values:

- The annual mean concentration of *E. coli* exceeds 10 *E. coli*/100 mL for systems using lake or reservoir sources;
- The annual mean concentration of *E. coli* exceeds 50 *E. coli*/100 mL for systems using flowing stream sources; or
- The level of a state-approved alternate indicator exceeds the state-approved alternative indicator trigger level.

Large and small systems that are unfiltered and meet all the filtration avoidance criteria of 40 CFR 141.71 must monitor for *Cryptosporidium* unless they provide 3 log *Cryptosporidium* inactivation by the time treatment is required.

#### 1.2.2.1 When are systems required to begin source water monitoring? [proposed §141.703]

Large systems must begin source water monitoring no later than [6 months after rule promulgation] and monitor at least monthly for 24 months. Small filtered systems and unfiltered systems required to filter must begin *E. coli* monitoring no later than [30 months after rule promulgation] and monitor for at least once every two weeks for 12 months. Small unfiltered systems and those small systems that exceeded the *E. coli* trigger levels must begin *Cryptosporidium* monitoring no later than [48 months after rule promulgation] and monitor at least twice each month for 12 months.

#### 1.2.2.2 Where are systems required to sample source water? [proposed §141.704]

Systems must take source water samples at a location prior to any treatment and where the water is no longer subject to surface runoff. If treatment is applied in an intake pipe and it is unfeasible for systems to sample, systems must sample as close to the intake as is feasible and at a similar depth and distance from shore.

Systems using a presedimentation basin or an off-stream raw water storage reservoir must take source water samples after the presedimentation basin or the off-stream storage reservoir but before any other treatment. Systems collecting samples after a presedimentation basin may not receive credit for the presedimentation basin as a toolbox option. The required sampling location for systems using GWUDI (including systems using bank filtration) differs depending on whether the GWUDI or bank filtered water is treated by subsequent filtration. Use of presedimentation basins, off-stream storage, GWUDI, or bank filtration during monitoring must be consistent with routine operational practice, and the state may identify additional reporting requirements to verify operational practices.

### **1.2.3 Disinfection Profiling and Benchmarking Requirements [proposed §141.711, §141.713]**

#### **1.2.3.1 Which systems need to develop profiles? [proposed §141.711]**

All systems that are required to monitor for *Cryptosporidium* must develop *Giardia* and virus disinfection profiles under the LT2ESWTR. In addition, small systems that do not exceed the *E. coli* trigger levels but exceed the following DBP levels must also develop *Giardia* and virus disinfection profiles:

- TTHM LRAA greater than or equal to 0.064 mg/L based on samples collected for compliance with Stage 2 DBPR.
- HAA5 LRAA greater than or equal to 0.048 mg/L based on samples collected for compliance with Stage 2 DBPR.

#### **1.2.3.2 What if systems previously collected data? [proposed §141.713]**

Systems can meet profiling requirements under the LT2ESWTR using previously collected data (i.e., grandfathered data). This data must be equivalent in sample number, frequency, and data quality to data that will be collected under the LT2ESWTR. Use of grandfathered data is allowed if the system has not made a significant change in disinfection practice or changed sources since the data were collected. This will permit most systems that prepared a disinfection profile under the IESWTR or the LT1ESWTR to avoid collecting any new operational data to develop profiles under the LT2ESWTR.

Systems that developed disinfection profiles under the IESWTR or LT1ESWTR and have not made significant changes in their disinfection practice are not required to collect additional operational data to create disinfection profiles under the LT2ESWTR.

#### **1.2.3.3 If a system developed a profile for *Giardia*, does it have to develop one for viruses? [proposed §141.713]**

Systems that produced a disinfection profile for *Giardia* but not viruses under the IESWTR or LT1ESWTR may be required to develop a disinfection profile for viruses under the LT2ESWTR. EPA believes that virus profiling is necessary because many of the disinfection processes that systems will select to comply with the LT2ESWTR and Stage 2 DBPR (e.g., chloramines, UV) are relatively less effective against viruses than *Giardia* compared to free chlorine. Systems should refer to the *Draft Disinfection Profiling and Benchmarking Guidance Manual* (USEPA, 1999) for details on how to develop a disinfection profile.

#### **1.2.3.4 When do systems have to conduct disinfection profiling? [proposed §141.712]**

Table 1-1 presents a summary of the required deadlines for disinfection profiling activities, categorized by system size and whether a small system is required to monitor for *Cryptosporidium*. The deadlines are based on the expectation that systems should have a disinfection profile at the time they are classified in a *Cryptosporidium* treatment bin under LT2ESWTR and/or have determined the need to make treatment changes for the Stage 2 DBPR.

### 1.2.3.5 What are the recordkeeping requirements for a disinfection profile? [proposed §141.713, §141.731]

PWSs must keep their disinfection profiles and disinfection benchmarks on file for the state to review during their sanitary surveys. The disinfection profile data should be in graphic form, as a spreadsheet, or in some other format acceptable to the state for review as part of sanitary surveys conducted by the state.

**Table 1-1. Schedule of Implementation Deadlines Related to Disinfection Profiling (in months after rule promulgation)**

Activity	Systems serving $\geq 10,000$ people <sup>1</sup>	Systems serving $< 10,000$ people <sup>1</sup>	
		Not required to monitor for <i>Cryptosporidium</i> <sup>1,2</sup>	Required to monitor for <i>Cryptosporidium</i>
Complete 1 year of <i>E. coli</i> monitoring	NA	42	42
Determine whether required to profile based on DBP levels and notify state	NA	42	NA
Begin disinfection profiling <sup>3</sup>	24	42	54
Complete <i>Cryptosporidium</i> monitoring	30	NA	60
Complete disinfection profiling based on at least 1 year of data <sup>4</sup>	36	54	66

<sup>1</sup> Systems providing a total of 5.5 log *Cryptosporidium* treatment (equivalent to meeting bin 4 treatment requirements) are not required to develop disinfection profiles.

<sup>2</sup> Systems serving fewer than 10,000 people are not required to monitor for *Cryptosporidium* if mean *E. coli* levels are less than 10/100 mL for systems using lake/reservoir sources or less than 50/100 mL for systems using flowing stream sources.

<sup>3</sup> Unless system has existing disinfection profiling data that are acceptable.

<sup>4</sup> This deadline coincides with the start of the 3-year period at the end of which compliance with the LT2ESWTR and Stage 2 DBPR is required.

## 1.2.4 Treatment Requirements

### 1.2.4.1 When do systems have to install additional treatment? [proposed §141.701]

All systems have 72 months (or approximately 36 months following initial bin classification) to meet any additional *Cryptosporidium* treatment requirements, as shown in Table 1-18 (see page 51) and Figure 1-2 (see page 55). The state may grant systems an additional 2 years to comply when capital investments are necessary, as specified in the SDWA (section 1412(b)(10)).

Systems must comply with additional *Cryptosporidium* treatment requirements, determined from source water monitoring, by implementing one or more treatment processes or control strategies from the microbial toolbox. Most of the toolbox components require submission of documentation to the state demonstrating compliance with design and/or implementation criteria required to receive credit.

#### 1.2.4.2 What are the requirements for *Cryptosporidium* treatment for filtered systems? [proposed §141.720]

Filtered systems or systems that are unfiltered and required to install filtration must provide the level of treatment for *Cryptosporidium* specified in Table 1-2 based on their bin classification.

**Table 1-2. Level of Treatment Required**

If the source water <i>Cryptosporidium</i> concentration in oocyst/l is...	And the system uses the following filtration treatment in full compliance with subpart H, P, and T (as applicable), then the additional treatment requirements are. . .			
	Conventional filtration treatment (including softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
<0.075	No additional treatment	No additional treatment	No additional treatment	No additional treatment
≥0.0075 and <1.0	1 log treatment.....	1.5 log treatment.....	1 log treatment.....	<sup>(1)</sup>
≥1.0 and <3.0	2 log treatment.....	2.5 log treatment.....	2 log treatment.....	<sup>(2)</sup>
≥3.0	2.5 log treatment.....	3 log treatment.....	2.5 log treatment.....	<sup>(3)</sup>

<sup>1</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 4.0 log.

<sup>2</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 5.0 log.

<sup>3</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 5.5 log.

The filtered systems must use at least one of the management and treatment options listed in the microbial toolbox to meet the additional *Cryptosporidium* treatment requirements identified for each bin. Systems classified in bins 3 and 4 (the highest *Cryptosporidium* levels) must achieve at least 1 log of the additional treatment using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, and/or UV as specified in the microbial toolbox.

#### 1.2.4.3 What are the requirements for *Cryptosporidium* treatment for unfiltered systems? [proposed §141.721]

Unfiltered systems with a mean *Cryptosporidium* concentration of 0.01 oocysts/L or less must provide at least 2 log *Cryptosporidium* inactivation. Unfiltered systems with a mean *Cryptosporidium* concentration of greater than 0.01 oocysts/L or those that failed to complete the source water monitoring requirements must provide at least 3 log *Cryptosporidium* inactivation.

Unfiltered systems must meet the combined *Cryptosporidium*, *Giardia lamblia*, and virus inactivation requirements using a minimum of two disinfectants. Each disinfectant must be able to achieve the total inactivation required for either *Cryptosporidium*, *Giardia lamblia*, or viruses separately. For example, a system may use UV to meet *Cryptosporidium* and *Giardia* inactivation requirements and chlorine to meet virus inactivation requirements. To meet the *Cryptosporidium* inactivation requirements, systems must use either or a combination of chlorine dioxide, ozone, or UV.

Disinfection requirements under the LT2ESWTR are more stringent for unfiltered systems than filtered systems. The following unfiltered systems will incur a treatment technique violation:

- Systems using chlorine dioxide or ozone that fail to achieve the *Cryptosporidium* log inactivation on more than 1 day in the calendar month.
- Systems using UV light that fail to achieve the *Cryptosporidium* log inactivation required in at least 95 percent of the water that is delivered to the public during each calendar month.

### 1.2.5 Microbial Toolbox Options Available to Systems

Systems can implement a variety of source, pre-filtration, treatment, additional filtration, and activation toolbox components to receive *Cryptosporidium* credit, as summarized in Table 1-3.

**Table 1-3. Microbial Toolbox: Options and Credits**

Toolbox option	Proposed <i>Cryptosporidium</i> credits
<i>Source Toolbox Components</i>	
Watershed control program	0.5 log credit. (Section 1.2.5.1)
Alternative source/intake management	No presumptive credit. (Section 1.2.5.2)
<i>Pre-filtration Toolbox Components</i>	
Presedimentation basin with coagulation	0.5 log credit for new basins with continuous operation and coagulant addition. No presumptive credit for basins existing when monitoring is required. (Section 1.2.6.1)
Two-stage lime softening	0.5 log credit for two-stage softening with coagulant addition. (Section 1.2.6.2)
Bank filtration	0.5 log credit for 25 foot setback; 1.0 log credit for 50 foot setback. No presumptive credit for bank filtration that serves as pretreatment when monitoring is required. (Section 1.2.6.3)
<i>Treatment Performance Toolbox Components</i>	
Combined filter performance	0.5 log credit for CFE turbidity $\leq 0.15$ NTU in 95% of samples each month. (Section 1.2.7.1)
Individual filter performance	1.0 log credit for IFE $\leq 0.1$ NTU in 95% of daily maximum samples each month and no filter $> 0.3$ NTU in two consecutive measurements. (Section 1.2.7.2)
Demonstration of performance	Credit based on demonstration to the state. (Section 1.2.7.3)
<i>Additional Filtration Toolbox Components</i>	
Bag filters	1 log credit for demonstrating at least 2 log removal efficiency in challenge test. (Section 1.2.8.1)
Cartridge filters	2 log credit for demonstrating at least 3 log removal efficiency in challenge test. (Section 1.2.8.1)
Membrane filtration	Log removal credit up to the lower value of the removal efficiency demonstrated during the challenge test or verified by the direct integrity test applied to the system. (Section 1.2.8.2)
Second stage filtration	0.5 log credit for second separate filtration stage in treatment process following coagulation. (Section 1.2.8.3)



Toolbox option	Proposed <i>Cryptosporidium</i> credits
Slow sand filters	2.5 log credit for second separate filtration process and no residual may be present in influent to slow sand process. (Section 1.2.8.4)
<i>Inactivation Toolbox Components</i>	
Chlorine dioxide	Demonstrate compliance with contact time table. (Section 1.2.9.1)
Ozone	Log credit based on demonstration of compliance with CT table. (Section 1.2.9.2)
UV	Demonstrate compliance based on UV dose table. (Section 1.2.9.3)

### 1.2.5.1 Watershed Control Program [proposed §141.725(a)]

Filtered systems must submit their watershed control programs to the state for approval to qualify for 0.5 log credit of *Cryptosporidium* removal. Unfiltered systems may not claim credit for *Cryptosporidium* removal under this option. Systems must submit the following items to the state no later than 2 years after completing the source water monitoring requirements:

- A proposed initial watershed control plan; and
- A request for plan approval and 0.5 log *Cryptosporidium* removal credit.

#### *Initial Watershed Control Plan*

Systems are required to notify the state program no later than 1 year after completing their source water monitoring that they intend to qualify for the treatment credit. Based on the state's review of the initial proposed watershed control plan, the plan may be approved, rejected, or conditionally approved. If the plan is approved or if the system agrees to implement the state's conditions for approval, the system is awarded a 0.5 log credit for *Cryptosporidium* removal.

The application to the state for initial program approval must include the following elements:

- An analysis of the vulnerability of each source to *Cryptosporidium*. The vulnerability analysis must address the watershed upstream of the drinking water intake and must include the following items:
  - A characterization of the watershed hydrology.
  - Identification of an “area of influence” (the area to be considered in future watershed surveys) outside of which there is little chance for *Cryptosporidium* or fecal contamination to affect the drinking water intake.
  - Identification of both potential and actual sources of *Cryptosporidium* contamination.
  - The relative impact of the sources of *Cryptosporidium* contamination on the system's source water quality.
  - An estimate of the seasonal variability of such contamination.

- An analysis of control measures that could mitigate the sources of *Cryptosporidium* contamination identified during the vulnerability analysis. The analysis must address the system's relative effectiveness in reducing *Cryptosporidium* loading to the source water and its feasibility and sustainability.
- A plan that establishes goals and defines and prioritizes specific actions to reduce source water *Cryptosporidium* levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their role(s), identify resource requirements and commitments, and include a schedule for plan implementation.

#### *Maintaining State Approval for Treatment Credit*

Initial state approval of a watershed control plan and its associated treatment credit is valid until the system completes the second round of *Cryptosporidium* monitoring. After the second round of monitoring, systems must complete the following actions to maintain state approval and the 0.5 log credit:

- Submit an annual watershed control program status report to the state by a date determined by the state. The annual watershed control program status report must describe the following items:
  - The system's implementation of the approved plan and an assessment of the adequacy of the plan to meet its goals.
  - How the system is addressing any shortcomings in plan implementation, including those previously identified by the state or as the result of the watershed survey.

In addition, systems need to provide a rationale to the state before making any substantial changes in their approved watershed control programs.

- Conduct an annual watershed sanitary survey and submit the survey report to the state for approval. The survey must be conducted according to state guidelines and by qualified persons. The survey needs to cover the area of the watershed identified as the area of influence and, at a minimum, assess the priority activities identified in the plan and identify any significant new sources of *Cryptosporidium*.
- Submit a request to the state for re-approval of the watershed control program and a continuation of the 0.5 log removal credit. The request must be provided to the state at least 6 months before the current approval period expires or by a date previously determined by the state. The request must include 1) a summary of activities and issues identified during the previous approval period and 2) a revised plan that addresses activities for the next approval period, including any new sources of *Cryptosporidium* contamination and details of any changes from the existing state-approved program. The plan must:
  - Address the goals of the program.
  - Prioritize specific actions to reduce source water *Cryptosporidium*.

- Explain how actions are expected to contribute to achieving goals.
- Identify partners and their role(s).
- Describe resource requirements and commitments.
- Include a schedule for plan implementation.
- Provide annual status reports, watershed control plan, and annual watershed sanitary surveys to the public upon request. These documents must be in plain language and include criteria to help determine whether the program has achieved its goals. Systems may withhold portions of the status reports for security reasons with state approval.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-4. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-4. Reporting Deadlines for Systems Choosing the Watershed Control Program Toolbox Option**

Systems must submit the following information	On the following schedule - systems serving ≥10,000 people	On the following schedule - systems serving <10,000 people
(i) Notify state of intention to develop watershed control program.	No later than [insert date 48 months after rule publication].	No later than [insert date 78 months after rule publication].
(ii) Submit initial watershed control program plan to state.	No later than [insert date 60 months after rule publication].	No later than [insert date 90 months after rule publication].
(iii) Annual report and state-approved watershed survey report.	By a date determined by the state, every 12 months, beginning on [insert date 84 months after rule publication].	By a date determined by the state, every 12 months, beginning on [insert date 114 months after rule publication].
(iv) Request for re-approval and report on the previous approval period.	Six months prior to the end of the current approval period or by a date previously determined by the state.	Six months prior to the end of the current approval period or by a date previously determined by the state.

### 1.2.5.2 Alternative Source [proposed §141.725(b)]

If approved by the state, a system can be classified into a bin based on additional monitoring that is conducted concurrently with existing source water monitoring and reflects either a different intake location (either in the same source or for an alternate source) or a different procedure for managing the timing or level of withdrawal from the source.

Sampling and analysis of *Cryptosporidium* in the concurrent round of monitoring must conform to the monitoring requirements used to determine bin classification. Systems must submit the results of all their monitoring to the state along with supporting information that documents the operating conditions under which the samples were collected.

If the state classifies the system in a bin based on monitoring that reflects a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the system must relocate the intake or use the intake management strategy. The state may specify additional reporting requirements to verify operational practices.

### 1.2.5.3 Pre-sedimentation with Coagulant [proposed §141.726(a)]

Presedimentation basins with coagulant addition may receive 0.5 log *Cryptosporidium* removal credit under the LT2ESWTR if they meet the following criteria:

- The presedimentation basin must be in continuous operation and must treat all of the flow reaching the filters.
- A coagulant must be continuously added to the presedimentation basin (or prior to) while the plant is in operation.
- The presedimentation basin must achieve 0.5 log (68 percent) turbidity reduction on an average monthly basis for at least 11 of the 12 previous months. For those systems not operating year-round, the 0.5 log turbidity reduction must be met for all but any one of the operating months (based on the last 12 consecutive months).

Systems must measure presedimentation basin influent and effluent turbidity at least once per day, or more frequently as determined by the state.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-5. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-5. Reporting Deadlines for Systems Choosing the Presedimentation Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
Monthly verification of the following: continuous basin operation; treatment of 100% of the flow; continuous addition of a coagulant; and at least 0.5 log removal of influent turbidity based on the monthly mean of daily turbidity readings for 11 of the 12 previous months.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 72 months after rule publication].	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

### 1.2.5.4 Two-stage Lime Softening [proposed §141.726(b)]

The LT2ESWTR requires plants to meet the following criteria in order to receive 0.5 log credit towards additional *Cryptosporidium* treatment requirements:

- The plant must have a second clarification step between the primary clarifier<sup>1</sup> and filter which is operated continuously. For split treatment processes, only the portion of flow going through two clarification stages can receive credit. If a portion of flow bypasses one stage, additional treatment must be provided to the bypassed portion.
- A coagulant must be present in both clarifiers. Precipitation of metal salts (e.g., magnesium hydroxide or excess lime) could be considered a coagulant for the second clarifier.

The LT2ESWTR requires monthly verification and reporting of the following conditions for systems using the lime softening option:

- Continuous operation of a second clarification step between the primary clarifier and filter.
- Continuous presence of coagulant in the first and second stage clarifiers.
- Both clarifiers treat 100 percent of the plant flow.

In addition, EPA recommends submitting a schematic of the treatment process to the state clearly identifying the two stages of clarification. EPA also recommends that systems monitor the coagulant dosages (or concentration) in the secondary clarifier on a daily basis for the first year and record the average and minimum coagulant concentrations. This data can assist the state in assessing whether the system operates in compliance at all times.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-6. The state may include additional reporting requirements, if it determines they are necessary.

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<sup>1</sup> For purposes of compliance with the lime-softening toolbox option, “clarifier” is used as a general term for processes with settling.

**Table 1-6. Reporting Deadlines for Systems Choosing the Two-stage Lime Softening Toolbox Option**

<b>Systems must submit the following information</b>	<b>On the following schedule<sup>1</sup> - systems serving ≥10,000 people</b>	<b>On the following schedule<sup>1</sup> - systems serving &lt;10,000 people</b>
Monthly verification of the following: continuous operation of a second clarification step between the primary clarifier and filter; continuous presence of a coagulant in both primary and secondary clarifiers; and both clarifiers treated 100% of the plant flow.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 72 months after rule publication].	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### **1.2.5.5 Bank Filtration [proposed §141.726(c)]**

The LT2ESWTR specifies the following design requirements for systems to receive log removal credit for bank filtration:

- Wells must draw from granular aquifers that are comprised of clay, silt, sand, or pebbles or larger particles. Minor cement may be present.
- The aquifer material must be unconsolidated, with subsurface samples friable upon touch.
  - Granular aquifers formed by alluvial or glacial processes are eligible for bank filtration credit.
  - Granular aquifers, either unconsolidated or partially consolidated and mapped as earlier than Quaternary alluvium, must be considered on a case-by-case basis by the state to determine if they are too cemented and, therefore, too fractured to provide sufficient natural filtration.
  - Wells located in consolidated clastic aquifers (e.g., conglomerates), fractured bedrock aquifers, and karst limestone aquifers are not eligible for bank filtration credit.
- Only horizontal and vertical wells are eligible for bank filtration log removal credit. Other ground water collection devices, such as infiltration galleries and spring boxes, are ineligible.
- Systems using horizontal or vertical wells located at least 25 feet from the surface water source are eligible for a 0.5 log removal credit, and those located at least 50 feet from the surface water source are eligible for a 1.0 log removal credit.
  - Systems with vertical wells must identify the distance to surface water using the floodway boundary or 100 year flood elevation boundary as delineated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate maps.

If the floodway boundary or 100 year flood elevation boundary is not already delineated, systems must determine the floodway or 100 year flood elevation boundary using methods substantially similar to those used in preparing FEMA Flood Insurance Rate maps.

- Systems with horizontal wells must measure the distance from the normal flow stream bed to the closest horizontal well lateral.
- Systems must characterize the aquifer at the proposed production well site to determine aquifer properties.
  - At a minimum, the aquifer characterization must include the collection of relatively undisturbed continuous core samples from the surface to a depth at least equal to the projected bottom of the well screen for the proposed production well.
  - The recovered core length must be at least 90 percent of the total depth to the projected bottom of the well screen, and each sampled interval must be a composite of no more than 2 feet in length.
  - Each composite sample must be examined to determine if at least 10 percent of the grains in that interval are less than 1.0 mm in diameter. Each composite sample with at least 10 percent of the grains less than 1.0 mm in diameter is considered an interval with sufficient fine-grained material to provide adequate removal.
  - An aquifer is eligible for removal credit if at least 90 percent of the composited intervals contain sufficient fine-grained material as defined previously.

The LT2ESWTR requires systems to monitor turbidity in bank filtration wells to provide assurance that the assigned log removal credit is appropriate. The LT2ESWTR specifically requires the following monitoring:

- Turbidity measurements must be performed on representative water samples from each wellhead every four hours that the bank filtration system is in operation or more frequently, if required by the state.
- Continuous turbidity monitoring at each wellhead may be used if the system validates the continuous measurement for accuracy on a regular basis using a protocol approved by the state.
- If the monthly average of daily maximum turbidity values at any well exceeds 1 Nephelometric Turbidity Unit (NTU), the system must report this finding to the state within 30 days. In addition, within 30 days of the exceedance the system must conduct an assessment to determine the cause of the high turbidity levels and submit that assessment to the state for a determination of whether any previously allowed credit is still appropriate.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-7. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-7. Reporting Deadline for Systems Choosing the Bank Filtration Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
(i) Initial demonstration of the following: unconsolidated, predominantly sandy aquifer and setback distance of at least 25 ft. (0.5 log credit) or 50 ft. (1.0 log credit).	Initial demonstration no later than [insert date 72 months after rule publication].	Initial demonstration no later than [insert date 102 months after rule publication].
(ii) If monthly average of daily max turbidity is greater than 1 NTU, then system must report result and submit an assessment of the cause.	Report within 30 days following the month in which the monitoring was conducted, beginning on [insert date 72 months after rule publication].	Report within 30 days following the month in which the monitoring was conducted, beginning on [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### 1.2.5.6 Combined Filter Performance [proposed §141.727(a)]

For systems using conventional or direct filtration treatment to obtain an additional 0.5 log *Cryptosporidium* removal credit, the LT2ESWTR requires that the CFE turbidity measurements taken for any month at each plant be less than or equal to 0.15 NTU in at least 95 percent of the measurements.

**Note that systems may not claim credit for combined filter performance AND individual filter performance in the same month.**

Compliance with the LT2ESWTR is determined in the same manner as measurements taken for the IESWTR and LT1ESWTR. In other words, the LT2ESWTR does not require any additional monitoring from the IESWTR and LT1ESWTR.

The monitoring frequency and compliance calculation requirements consist of measuring turbidity at 4-hour intervals (or more frequently) with 95 percent of the measurements from each month being less than or equal to 0.15 NTU.



Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-8. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-8. Reporting Deadlines for Systems Choosing the Combined Filter Performance Toolbox Option**

Systems must submit the following information	On the following schedule - systems serving $\geq 10,000$ people	On the following schedule - systems serving $< 10,000$ people
Monthly verification of CFE turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the 4 hour CFE measurements taken each month.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 72 months after rule publication].	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 102 months after rule publication].

#### 1.2.5.7 Individual Filter Performance [proposed §141.727(b)]

The LT2ESWTR allows systems using conventional or direct filtration treatment to claim an additional 1.0 log *Cryptosporidium* removal credit for any month at each plant that meet both of the following IFE turbidity requirements:

- IFE turbidity must be less than 0.1 NTU in at least 95 percent of the maximum daily values recorded at each filter in each month, excluding the 15 minute period following return to service from a filter backwash; and
- No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

Systems may not claim credit for combined filter performance AND individual filter performance in the same month. As with CFE, compliance with the LT2ESWTR is determined in the same manner as measurements taken for the IESWTR and LT1ESWTR, so no additional monitoring is required.

The monitoring frequency and compliance calculation requirements consist of measuring turbidity every 15 minutes (excluding the 15 minute period following return to service from a filter backwash) with 95 percent of the measurements from each month being less than or equal to 0.1 NTU.

The LT2ESWTR specifies that no individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart. If the individual filter is not providing water which contributes to the CFE (i.e., it is not operating, is filtering to waste, or its filtrate is being recycled), the system does not need to report the turbidity for that specific filter.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-9. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-9. Reporting Deadlines for Systems Choosing the Individual Filter Performance Toolbox Options**

<b>Systems must submit the following information</b>	<b>On the following schedule - systems serving <math>\geq 10,000</math> people</b>	<b>On the following schedule - systems serving <math>&lt;10,000</math> people</b>
Monthly verification of the following: IFE turbidity levels less than or equal to 0.1 NTU in at least 95 percent of all daily maximum IFE measurements taken each month (excluding 15 min period following start-up after backwash), and no individual filter greater than 0.3 NTU in two consecutive readings 15 minutes apart.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 72 months after rule publication].	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on [insert date 102 months after rule publication].

#### **1.2.5.8 Demonstration of Performance: What if a system can perform better than the presumptive credit specified in the toolbox?**

The LT2ESWTR does not specify how treatment performance must be demonstrated for the demonstration of performance option; however, the protocol used must be approved by the state. Determination of an increased *Cryptosporidium* treatment credit will be made by the state.

The demonstration of performance applies to the physical removal processes at a treatment plant. Therefore, the LT2ESWTR does not allow systems to claim presumptive credit for the toolbox options listed below if that component is included in the demonstration of performance credit.

- Presedimentation.
- Two-stage lime softening.
- Bank filtration.
- Combined or individual filter performance.
- Membrane filters.
- Bag and cartridge filters.
- Second stage filtration.

For example, if a plant receives a demonstration of performance credit for a treatment train, the system may not also receive credit for a presedimentation basin or for achieving the lower finished water turbidity of the combined filter performance option. Note that demonstrating performance for a disinfection process (chlorine dioxide, ozone, or UV) is addressed under the disinfectant toolbox option and not this option.

States may award a lower level of *Cryptosporidium* treatment credit towards compliance for the LT2ESWTR to a system where, based on site-specific information, a plant or a unit process achieves a *Cryptosporidium* treatment efficiency less than a presumptive credit specified in the LT2ESWTR.

The LT2ESWTR requires results from the testing be submitted no later than [insert date 72 months after promulgation] for large systems and [insert date 102 months after promulgation] for small systems. The

state may require systems to report operational data on a monthly basis to verify that conditions under which demonstration of performance credit was awarded are maintained during routine operation.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-10. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-10. Reporting Deadlines for Systems Choosing the Demonstration of Performance Toolbox Option**

<b>Systems must submit the following information</b>	<b>On the following schedule - systems serving <math>\geq 10,000</math> people</b>	<b>On the following schedule - systems serving <math>&lt; 10,000</math> people</b>
(i) Results from testing following a state-approved protocol.	No later than [insert date 72 months after rule publication].	No later than [insert date 102 months after rule publication].
(ii) As required by the state, monthly verification of operation within conditions of state approval for demonstration of performance credit.	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

#### **1.2.5.9 Bag and Cartridge Filtration [proposed §141.728(a)]**

Bag and cartridge filtration processes that meet the EPA definition and demonstrate *Cryptosporidium* removal through challenge testing may receive the following *Cryptosporidium* removal credit for the LT2ESWTR:

- 1 log removal for bag filtration showing a minimum of 2 log removal in challenge testing.
- 2 log removal for cartridge filtration showing a minimum of 3 log removal in challenge testing.

A 1 log factor of safety is applied to the allowable removal credit over that demonstrated by challenge testing because bag and cartridge filters cannot have their integrity directly tested; hence, there are no means of verifying their removal efficiency during routine use.

Recently, some cartridge filtration devices have been developed for drinking water treatment using membrane media, which can be direct integrity tested. These membrane cartridge filters (MCFs) could be considered a membrane filtration process for the purpose of compliance with the LT2ESWTR treatment requirements for *Cryptosporidium* (i.e., the MCF process would be eligible for the same credit, and subject to the same requirements, as a membrane filtration process). Manufacturers can provide information on direct integrity testing and whether it is feasible with their products. Refer to EPA's *Draft Membrane Filtration Guidance Manual* (EPA 815-D-03-008, June 2003) for direct integrity testing and other membrane filtration requirements.

States may choose to award removal credits in excess of 1 and 2 log for bag and cartridge filtration, respectively, if challenge testing demonstrates that the process can reliably achieve a greater removal efficiency.

All reporting requirements for the SWTR, IESWTR, and LT1ESWTR are still applicable; the LT2ESWTR does not modify or replace any previous rule requirements. The location of filter effluent turbidity monitoring for compliance with the IESWTR and LT1ESWTR does not change with the installation of a bag or cartridge filter as a secondary filtration process. Therefore, a system would still monitor filter effluent turbidity after the primary filters for compliance with the IESWTR and LT1ESWTR.

The LT2ESWTR requires systems to submit an initial report by **[insert date 72 months after rule promulgation]** for large systems and **[insert date 102 months after rule promulgation]** for small systems that demonstrates the following:

- Process meets the definition of a bag or cartridge filter.
- Removal efficiency from challenge testing that must show at least 2 log removal for bag filters and 3 log removal for cartridge filters.

For routine compliance reporting, the rule requires verification that all flow was treated by the bag or cartridge filter. One possible approach states may elect to use for flow verification is to have operators certify each month that all flow was treated by the filter. States may require additional reporting at their discretion.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-11. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-11. Reporting Deadlines for Systems Choosing the Bag Filters and Cartridge Filters Toolbox Option**

<b>Systems must submit the following information</b>	<b>On the following schedule<sup>1</sup> - systems serving ≥10,000 people</b>	<b>On the following schedule<sup>1</sup> - systems serving &lt;10,000 people</b>
(i) Demonstration that the following criteria are met: process meets the definition of bag or cartridge filtration; removal efficiency established through challenge testing that meets criteria in this subpart; and challenge test shows at least 2 log removal for bag filters and 3 log removal for cartridge filters.	No later than [insert date 72 months after rule publication].	No later than [insert date 102 months after rule publication].
(ii) Monthly verification that 100% of flow was filtered.	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### **1.2.5.10 Membrane Filtration [proposed §141.728(b)]**

To receive removal credit, a system's membrane technology must be a pressure- or vacuum-driven separation process in which particulate matter larger than 1 µm is rejected by a nonfibrous, engineered barrier, primarily through a size exclusion mechanism. Membrane technologies include microfiltration, ultrafiltration, nanofiltration, and reverse osmosis. Routine direct integrity testing of the membrane technology must verify that the removal efficiency demonstrated through challenge testing is being achieved.

Compliance for a membrane process has three components:

- Challenge test—a test of the membrane's ability to remove introduced *Cryptosporidium* oocysts or surrogates, in simulation of operational conditions. Challenge testing is required for specific products and is not intended to be site specific.
- Direct integrity test—routine testing of each membrane unit that demonstrates removal efficiency equal to or greater than awarded from the challenge test. Systems must conduct testing at least once per day while in operation. In addition, systems must submit a monthly report to the state summarizing all direct integrity test results above the control limit associated with the *Cryptosporidium* removal credit along with the corrective action that was taken in each case.
- Indirect integrity monitoring—continuous monitoring of each membrane unit. If direct integrity testing is continuous, systems are not subject to indirect integrity testing requirements.

The removal efficiency demonstrated during challenge testing establishes the maximum removal credit that a membrane filtration process is eligible to receive, provided this value is less than or equal to the maximum log removal value that can be verified by the direct integrity test. A direct integrity test is a physical test applied to a membrane unit to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate). At the discretion of the state, data from challenge studies conducted prior to promulgation of this regulation may be considered in lieu of additional testing.

Additional requirements and guidance for conducting the three tests to comply with the LT2ESWTR is provided in the *Draft Membrane Filtration Guidance Manual* (EPA 815-D-03-008, June 2003).

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-12. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-12. Reporting Deadlines for Systems Choosing the Membrane Filtration Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
(i) Results of verification testing demonstrating the following: Removal efficiency established through challenge testing that meets criteria in this subpart, and integrity testing and associated baseline.	No later than [insert date 72 months after rule publication].	No later than [insert date 102 months after rule publication].
(ii) Monthly report summarizing all direct integrity tests above the control limit and, if applicable, any indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### 1.2.5.11 Second Stage Filtration [proposed §141.728(c)]

Under the LT2ESWTR, a system that employs a second, separate filtration stage meeting the following criteria may receive 0.5 log credit for *Cryptosporidium* removal:

- The first stage of filtration is preceded by a coagulation step.
- The second stage of filtration is comprised of rapid sand, dual media, granular activated carbon (GAC), or other fine grain media.
- Both filtration stages treat 100 percent of plant flow.

To receive *Cryptosporidium* removal credit for compliance with the LT2ESWTR, systems must report the following monthly:

- Verification that 100 percent of finished water was treated by two stages of filtration. Actual data or information required to report is determined by the state. EPA recommends plant piping schematics be initially reported followed by monthly operator certification.

Reporting requirements for the LT2ESWTR do not take the place of the IESWTR and LT1ESWTR reporting requirements. Specifically, the turbidity of the combined and individual filter effluent from the first filtration stage must be reported as required by the IESWTR and LT1ESWTR.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-13. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-13. Reporting Deadlines for Systems Choosing the Second Stage Filtration Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
Monthly verification that 100% of flow was filtered through both stages.	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### 1.2.5.12 Slow Sand Filters [proposed §141.728(d)]

A system integrating a slow sand filtration process for the second stage of filtration meeting the following criteria can receive 2.5 log credit for *Cryptosporidium* removal:

- No disinfectant residual is present in the influent to the slow sand filtration process.
- Both filtration stages treat 100 percent of plant flow.

To receive *Cryptosporidium* removal credit for compliance with the LT2ESWTR, systems must report monthly verification that 100 percent of finished water was filtered. Plants that wish to consider slow sand filtration should either have sufficient excess filtration capacity to allow filters to operate in series (with possible piping modifications) or have sufficient land area to build additional filters.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-14. The state may include additional reporting requirements, if it determines they are necessary.



**Table 1-14. Reporting Deadlines for Systems Choosing the Slow Sand Filtration Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
Monthly verification that 100% of flow was filtered.	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

### 1.2.5.13 Chlorine Dioxide [proposed §141.729(b)]

Systems using chlorine dioxide must calculate contact time (“CT”) to determine their inactivation credit for *Cryptosporidium*. CT is the product of the disinfectant concentration (“C”) and disinfectant contact time (“T”, in minutes). Unless the state approves alternative CT values for a system, systems must calculate CT values for each day based on measurements of C during peak hourly flow and use the table in proposed §141.729(b) to determine their inactivation credit. Systems with several disinfection segments (i.e., a treatment unit process with a measurable disinfectant residual level and a liquid volume) may calculate CT values for each segment and sum those values to obtain a total log inactivation.

Systems may also conduct a site-specific inactivation study to determine the CT values necessary to meet a specified *Cryptosporidium* log inactivation level using a state-approved protocol. The alternative CT values determined from the site-specific study and the method of calculation must be approved by the state to ensure that the CT values are adequate to achieve the inactivation required under the LT2ESWTR. The *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides guidance for conducting a site-specific inactivation study.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-15. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-15. Reporting Deadlines for Systems Choosing the Chlorine Dioxide Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
Summary of CT values for each day based on the table in proposed §141.729(b).	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

### 1.2.5.14 Ozone [proposed §141.729(c)]

Systems using ozone must calculate CT values using methods similar to those for chlorine dioxide. Unless the state approves alternative CT values for a system, systems must use the table in proposed §141.729(b) to determine *Cryptosporidium* log inactivation credit. Systems should refer to the *Draft*



*Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) for guidance on calculating CT values for different disinfection reactor designs and operations.

As with chlorine dioxide, systems may also conduct a site-specific inactivation study to determine the CT values necessary to meet a specified *Cryptosporidium* log inactivation level using a state-approved protocol. The alternative CT values determined from the site-specific study and the method of calculation must be approved by the state to ensure that the CT values are adequate to achieve the inactivation required under the LT2ESWTR.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-16. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-16. Reporting Deadlines for Systems Choosing the Ozone Toolbox Option**

Toolbox Option	Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
Ozone	Summary of CT values for each day based on the table in proposed §141.729(c).	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

#### 1.2.5.15 Ultraviolet Light [proposed §141.729(d)]

Systems may claim credit for UV processes for inactivation of *Cryptosporidium*, *Giardia lamblia*, and viruses. The allowable inactivation credit for each pathogen must be based on the UV dose delivered by the system's UV reactors in relation to the UV dose table in proposed §141.729(d). The UV dose values in the dose table are only applicable to post-filter application of UV in systems that filter and to unfiltered systems that meet all the filtration avoidance criteria of 40 CFR 141.71. Systems may be able to receive credit for up to 3 log inactivation of *Cryptosporidium* and *Giardia lamblia* and up to 4 log inactivation of viruses.

The log credits included in this UV dose table are for UV light at a wavelength of 254 nm, as produced by a low pressure mercury vapor lamp. Systems can apply this table to UV reactors with other lamp types through reactor validation testing (i.e., performance demonstration). The validation testing must demonstrate the operating conditions under which the reactor can deliver the necessary UV dose, and systems must monitor their UV reactors to demonstrate that they maintain validated operating conditions during routine use. Systems must monitor for UV intensity as measured by a UV sensor, flow rate, and lamp outage and for any other parameters required by the state. In addition, systems need to check the calibration of UV sensors and recalibrate them in accordance with a protocol approved by the state. EPA's *Draft UV Disinfection Guidance Manual* (EPA 815-D-03-007, June 2003) provides a protocol for validating reactors and guidance on the design and implementation of UV systems.

Systems must report to the state any toolbox options used to comply with the *Cryptosporidium* treatment technique requirement in accordance with Table 1-17. The state may include additional reporting requirements, if it determines they are necessary.

**Table 1-17. Reporting Deadlines for Systems Choosing the UV Toolbox Option**

Systems must submit the following information	On the following schedule <sup>1</sup> - systems serving ≥10,000 people	On the following schedule <sup>1</sup> - systems serving <10,000 people
(i) Validation test results demonstrating operating conditions that achieve required UV dose.	No later than [insert date 72 months after rule publication].	No later than [insert date 102 months after rule publication].
(ii) Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in proposed §141.729(d).	Within 10 days following the month in which monitoring was conducted, beginning [insert date 72 months after rule publication].	Within 10 days following the month in which monitoring was conducted, beginning [insert date 102 months after rule publication].

<sup>1</sup> States may allow up to an additional 2 years to the date when the first submittal must be completed for systems making capital improvements.

### 1.2.6 Uncovered Finished Reservoir Requirements [proposed §141.724]

Systems using uncovered finished water storage facilities must comply with one of the following conditions:

- Cover any uncovered finished water storage facility;
- Treat the discharge from the uncovered finished water storage facility to the distribution system to achieve at least 4 log virus inactivation; or
- Implement a state-approved risk mitigation plan that addresses physical access and site security, surface runoff, animal and bird waste, ongoing water quality assessments, and a schedule for implementation.

### 1.2.7 PWS Recordkeeping Requirements [proposed §141.731]

Systems must keep results from monitoring until 36 months after all source water monitoring has been completed. Systems must keep a record of any notification to the state that they will not conduct source water monitoring because they are a filtering system that will provide at least 5.5 log treatment or a ground water system that will provide 3 log inactivation. Systems required to develop disinfection profiles must keep the profiles on file for state review during sanitary surveys.

## **1.2.8 Public Notification of Drinking Water Violations [proposed §141 Subpart Q, Appendix A]**

Under LT2ESWTR there are two types of violations that require Tier 2 or Tier 3 notification. Tier 2 notifications are for treatment technique violations, and Tier 3 notifications are for monitoring, testing procedure, and reporting violations.

### **1.2.8.1 Water are examples of a Tier 2 violation?**

A Tier 2 public notification of a treatment technique violation is required for failure to:

- Cover uncovered finished water reservoirs or treat reservoir discharge to the distribution system;
- Install the level of treatment appropriate for a filtered system's bin classification and existing treatment; and
- Install the level and type of treatment appropriate for an unfiltered system's *Cryptosporidium* concentration.

### **1.2.8.2 What are examples of a Tier 3 violation?**

A Tier 3 public notification of monitoring and testing procedure violations is required for failure to:

- Conduct source water monitoring and report results to the state;
- Notify the state before making a significant change in disinfection;
- Submit reports to determine if system is required to develop disinfection profiles;
- Develop disinfection profiles;
- Submit a sampling schedule to the state;
- Sample within 2 days of the scheduled date;
- Sample at the required location;
- Use an approved laboratory and an approved analytical method;
- Provide information regarding proper installation and operation of toolbox components;
- Maintain copies of source water monitoring and bin classification; and
- Maintain disinfection profiles on file for state review during sanitary surveys.

More information on public notification requirements can be found at

<http://www.epa.gov/safewater/pn.html>.

## 1.2.9 Consumer Confidence Report Requirements

The LT2ESWTR does not specifically modify the Consumer Confidence Report (CCR) Rule requirements. However, CCRs must contain any violations of TT requirements or violations of NPDWR requirements. This includes any such violations of the LT2ESWTR.

**More information can be obtained from:**

- A. The Long Term 2 Enhanced Surface Water Treatment Rule 68 FR 47640 (August 11, 2003); and <http://www.epa.gov/safewater/lt2/>
- B. The EPA Safe Drinking Water Hotline, Telephone: 1.800.426.4791

More information on consumer confidence report requirements can be found at <http://www.epa.gov/safewater/ccr1.html>.

## 1.3 Requirements of the Rule: States or Other Primacy Agents

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The following rule requirements are from the LT2ESWTR published in the *Federal Register* on August 11, 2003 (68 FR 47640). For a copy of the actual rule language, see Appendix B, or visit EPA's Web site at <http://www.epa.gov/safewater/lt2/> for a copy of the *Federal Register* notice.

### 1.3.1 Special Primacy Requirements [proposed §142.16]

In order to receive primacy for the LT2ESWTR, states must adopt regulations no less stringent than this rule. States must submit a primacy application consisting of revisions to their programs, regulations, or authorities no later than **[insert date 2 years after rule publication]**, although states may request an extension of up to 2 additional years.

In addition, states are required to show in their primacy application that they have the authority to implement key provisions of the rule by describing the following (see Chapter 4, section 4.4):

- Assess significant changes in the watershed and source water as part of the sanitary survey process and determine appropriate follow-up action.
- Approve watershed control programs for the 0.5 log watershed control program credit in the microbial toolbox.
- Approve protocols for treatment credits under the demonstration of performance toolbox option and for alternative ozone and chlorine dioxide CT values.
- Determine that a system with an uncovered finished water reservoir has a risk mitigation plan that is adequate for purposes of waiving the requirement to cover or treat the reservoir.

### 1.3.2 State Recordkeeping Requirements [proposed §142.14]

The current regulations in 40 CFR 142.14 require states with primacy to keep various records including analytical results to determine compliance with MCLs, MRDLs, and TT requirements; system inventories; state approvals; enforcement actions; and variance and exemption status. The LT2ESWTR requires that the state keep records related to any decisions made pursuant to the requirements in proposed §141.700–§141.724. In addition, states must keep records of:

- Results of source water *E. coli* and *Cryptosporidium* monitoring.
- *Cryptosporidium* bin classification for each filtered system, including any changes to initial bin classification based on review of the watershed during sanitary surveys or the second round of monitoring.
- Determination of whether each unfiltered system has a mean source water *Cryptosporidium* level above 0.01 oocysts/L.
- The treatment processes or control measures that each system employs to meet *Cryptosporidium* treatment requirements under the LT2ESWTR; this includes documentation to demonstrate compliance with required design and implementation criteria for receiving credit for microbial toolbox options.
- A list of systems required to cover or treat their reservoirs and systems that have received a waiver for the requirement to cover or treat reservoirs along with the associated risk mitigation plan.
- A list of systems for which the state has waived the requirement to cover or treat the effluent of an uncovered finished water storage facility, along with supporting documentation of the risk mitigation plan.

### 1.3.3 State Reporting Requirements [proposed §142.15]

The current regulations in 40 CFR 142.15 require states with primacy to keep various records to determine compliance with treatment technique requirements, system inventories, state approvals, and enforcement actions. In addition, states must keep records of:

- The initial bin classification for each system that currently provides filtration or that is unfiltered and required to install filtration, along with any change in bin classification due to watershed assessment during sanitary surveys or the second round of source water monitoring.
- The determination of whether each system that is unfiltered and meets all the filtration avoidance criteria of 40 CFR 141.71 of this chapter has a mean source water *Cryptosporidium* level above 0.01 oocysts/L, along with any change in this determination due to the second round of source water monitoring.

## 1.4 Summary of Action Dates

### 1.4.1 Applicability and Compliance Dates

The LT2ESWTR applies to systems using surface or GWUDI as a source and focuses on source water conditions and the appropriate level of treatment [proposed §141.700]. Table 1-18 summarizes key compliance dates required (in **bold**) by the LT2ESWTR, as well as suggested action dates (shaded). Systems must comply with treatment requirements based on their specific risk characterizations, as determined through source water monitoring. The compliance dates are designed to allow for systems to simultaneously comply with the Stage 2 DBPR in order to balance risks in the control of microbial pathogens versus risks associated with DBPs.

**Table 1-18. Summary of Action Dates for the LT2ESWTR**

Date	LT2ESWTR Action
[Insert date of rule publication]	Final rule is published in <i>Federal Register</i> .
[Insert date of rule publication]	States should begin working with EPA to identify source water monitoring requirements for all systems and communicate requirements to affected large systems.
[Insert date of rule publication]	States should begin determining whether systems' risk mitigation plans are adequate for purposes of waiving the requirement to cover or treat the reservoir.
	States should begin assessing significant changes in the watershed and source water as part of the sanitary survey process and determine appropriate follow-up actions.
	State should begin approving watershed control programs for the 0.5 log watershed control program credit in the microbial toolbox.
	States should begin approving protocols for treatment credits under the demonstration of performance toolbox option and for alternative ozone and chlorine dioxide CT values.
3 months after rule publication [Insert date]	States are encouraged to communicate with affected systems regarding LT2ESWTR requirements.
No later than 3 months after rule promulgation [Insert Date].	Filtered and unfiltered surface water systems serving $\geq 10,000$ people that filter must submit a sampling schedule for their initial round of source water monitoring. [proposed §141.703(a)(1)]
No later than 6 months after rule promulgation [Insert Date].	Filtered and unfiltered surface water systems serving $\geq 10,000$ people that filter must begin their initial source water monitoring at least monthly for 24 months. [proposed §141.701(e)]
12 months after rule promulgation [Insert Date].	States are encouraged to update their data management systems.

Date	LT2ESWTR Action
12 months after rule promulgation [Insert Date].	States are encouraged to communicate LT2ESWTR requirements related to treatment, uncovered finished water reservoirs, and disinfection profiling to affected large systems.
15 months after rule promulgation [Insert Date].	States are encouraged to communicate LT2ESWTR requirements related to source water monitoring to affected small systems.
No later than 24 months after rule promulgation [Insert Date].	Systems serving $\geq 10,000$ people required to conduct <i>Cryptosporidium</i> monitoring must begin disinfection profiling. [proposed §141.712]
	Systems must submit risk mitigation plans to state for uncovered finished water reservoirs. [proposed §141.724(a)(3)]
No later than 27 months after rule promulgation [Insert Date].	Surface water systems serving $<10,000$ people that filter must submit a sampling schedule for their <i>E. coli</i> monitoring. [proposed §141.703(a)(2)]
30 months after rule promulgation [Insert Date].	States are encouraged to communicate LT2ESWTR requirements related to treatment, uncovered finished water reservoirs, and disinfection profiling to affected small systems.
	States should begin specifying any alternative <i>E. coli</i> indicator values for small systems.
	States should begin awarding <i>Cryptosporidium</i> treatment credit for primary treatments in place.
No later than 30 months after rule promulgation [Insert Date].	Surface water systems serving $<10,000$ people that filter must begin monitoring bi-weekly for <i>E. coli</i> for 1 year. States may designate an alternate indicator monitoring strategy. [proposed §141.701(e)]
36 months after rule promulgation [Insert Date].	States should begin overseeing disinfection profiling and benchmarking for large systems.
	States should oversee large system risk bin assignments.
No later than 36 months after rule promulgation [Insert Date].	Filtered and unfiltered surface water systems serving $\geq 10,000$ people must report their initial bin classification based on their initial round of source water monitoring. [proposed §141.730(c)-(d)]
	Systems serving $\geq 10,000$ people required to conduct <i>Cryptosporidium</i> monitoring must have <i>Giardia</i> and virus disinfection profiles on file for state review during sanitary surveys. [proposed §141.730(f)]
	Systems are required to comply with uncovered finished water reservoirs provisions. [proposed §141.701(h)]
No later than 42 months after rule promulgation [Insert Date].	Systems serving $<10,000$ people that are not required to conduct <i>Cryptosporidium</i> monitoring and exceed DBP triggers must begin disinfection profiling. <sup>1, 2</sup> [proposed §141.712]
No later than 45 months after rule promulgation [Insert Date].	Systems serving $<10,000$ people that exceed <i>E. coli</i> trigger and unfiltered systems must submit a sampling schedule for their initial round of monitoring. [proposed §141.703(a)(3)]



Date	LT2ESWTR Action
No later than 48 months after rule promulgation <b>[Insert Date]</b> .	Systems serving <10,000 people that exceed <i>E. coli</i> trigger and unfiltered systems must begin monitoring for <i>Cryptosporidium</i> (twice/month) for 1 year. [proposed §141.701(e)]
No later than 54 months after rule promulgation <b>[Insert Date]</b> .	Systems serving <10,000 people that are not required to conduct <i>Cryptosporidium</i> monitoring and exceed DBP triggers must have <i>Giardia</i> and virus disinfection profiles on file for state review during sanitary surveys. <sup>1, 2</sup> [proposed §141.730(f)]
	Systems serving <10,000 people that are required to conduct <i>Cryptosporidium</i> monitoring must begin disinfection profiling. [proposed §141.712]
66 months after rule promulgation <b>[Insert Date]</b> .	States should begin overseeing disinfection profiling and benchmarking for small systems.
	States should oversee small system risk bin assignments.
No later than 66 months after rule promulgation <b>[Insert Date]</b> .	Systems serving <10,000 people that exceed <i>E. coli</i> trigger must report their initial bin classification. [proposed §141.730(c)(2)]
	Unfiltered systems serving <10,000 people must report initial mean <i>Cryptosporidium</i> concentration based on their initial round of monitoring. [proposed §141.730(d)(2)]
	Systems serving <10,000 people that are required to conduct <i>Cryptosporidium</i> monitoring must have <i>Giardia</i> and virus disinfection profiles on file for state review during sanitary surveys. [proposed §141.730(f)]
No later than 72 months after rule promulgation <b>[Insert Date]</b> .	Based on first round of source water monitoring, surface water systems (filter and unfiltered) serving ≥10,000 people must meet any additional <i>Cryptosporidium</i> treatment requirements. <sup>3</sup> [proposed §141.701(e)]
84 months after rule promulgation <b>[Insert Date]</b> .	States should award <i>Cryptosporidium</i> treatment credit to large systems for toolbox option implementation.
No later than 102 months after rule promulgation <b>[Insert Date]</b> .	Based on first round of source water monitoring, surface water systems (filter and unfiltered) serving <10,000 people must meet any additional <i>Cryptosporidium</i> treatment requirements. <sup>3</sup> [proposed §141.701(e)]
No later than 105 months after rule promulgation <b>[Insert Date]</b> .	Filtered and unfiltered systems serving ≥10,000 people must submit a sampling schedule for their second round of source water monitoring. [proposed §141.703(a)(4)]
No later than 108 months after rule promulgation <b>[Insert Date]</b> .	Filtered and unfiltered systems serving ≥10,000 people must begin a second round of source water monitoring. [proposed §141.702(d)(1)]
114 months after rule promulgation <b>[Insert Date]</b> .	States should award <i>Cryptosporidium</i> treatment credit to small systems for toolbox option implementation.



Date	LT2ESWTR Action
No later than 138 months after rule promulgation <b>[Insert Date]</b> .	Filtered and unfiltered systems serving $\geq 10,000$ people must report their bin classification based on results from second round of monitoring. [proposed §141.730(c)-(d)]
	Systems serving $< 10,000$ people must begin a second round of source water monitoring. [proposed §141.702(d)(2)]
No later than 153 months after rule promulgation <b>[Insert Date]</b> .	Filtered systems serving $< 10,000$ people that exceed <i>E. coli</i> trigger and unfiltered systems must submit a sampling schedule for their second round of monitoring. [proposed §141.703(a)(4)]
No later than 156 months after rule promulgation <b>[Insert Date]</b> .	Filtered systems serving $< 10,000$ people that exceed <i>E. coli</i> trigger and unfiltered systems must begin their second round of <i>Cryptosporidium</i> monitoring. [proposed §141.702(d)(2)-(3)]
No later than 174 months after rule promulgation <b>[Insert Date]</b> .	Systems serving $< 10,000$ people must report their bin classification based on results from second round of monitoring. [proposed §141.730(c)(2)]
	Unfiltered systems serving $< 10,000$ people must report their mean <i>Cryptosporidium</i> concentration based on their second round of monitoring. [proposed §141.730(d)(2)]
No later than <b>X months</b> after rule promulgation <b>[Insert Date]</b> .	Based on second round of source water monitoring, surface water systems (filter and unfiltered) serving $\geq 10,000$ people must meet any additional <i>Cryptosporidium</i> treatment requirements. <b>[proposed §141.XXX]</b>
No later than <b>X months</b> after rule promulgation <b>[Insert Date]</b> .	Based on second round of source water monitoring, surface water systems (filter and unfiltered) serving $< 10,000$ people must meet any additional <i>Cryptosporidium</i> treatment requirements. <b>[proposed §141.XXX]</b>

<sup>1</sup> Systems that provide at least 5.5 log of *Cryptosporidium* treatment are not required to conduct *Cryptosporidium* monitoring.

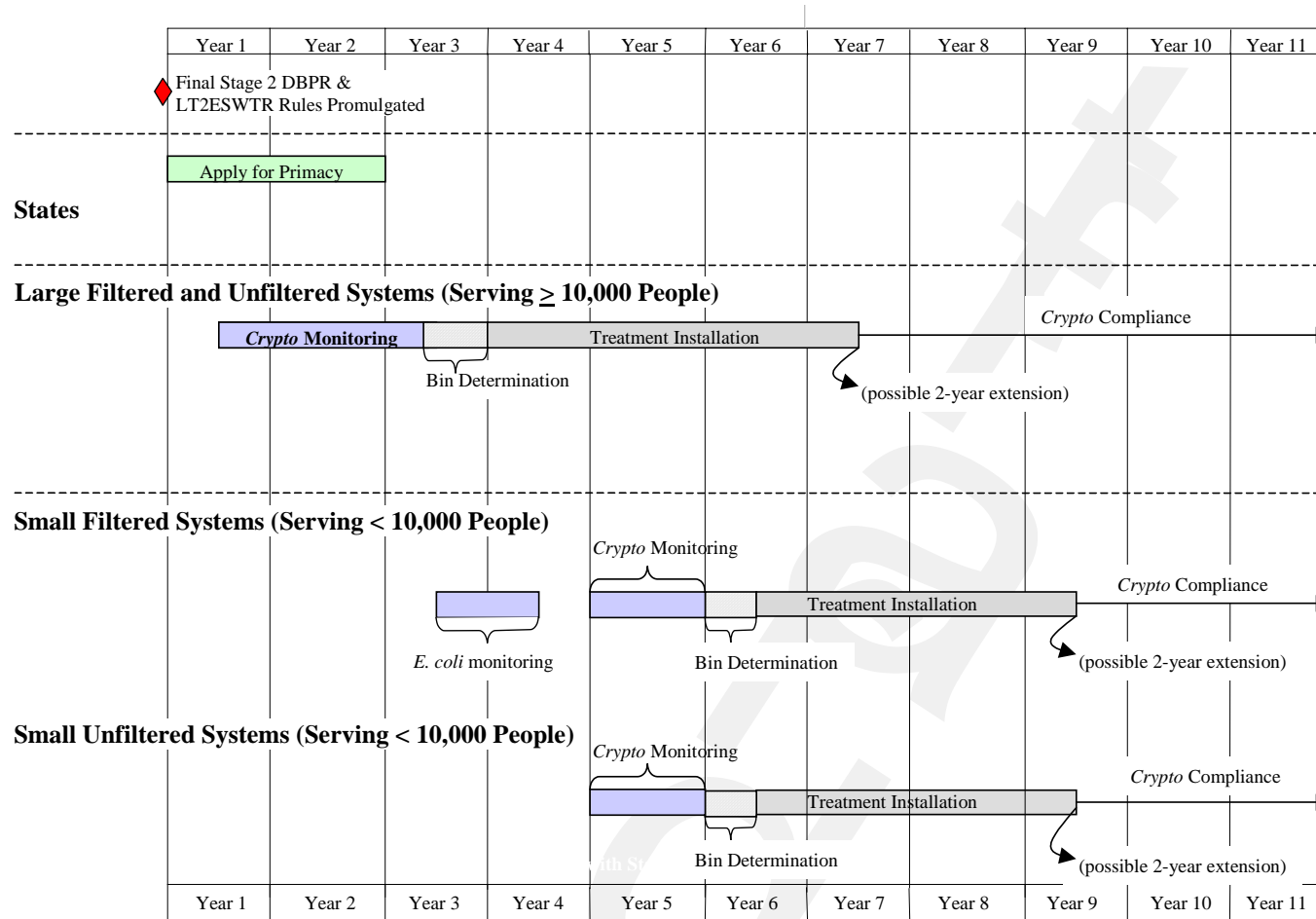
<sup>2</sup> System with TTHM and HAA5 levels that exceed 0.064 mg/L and 0.048 mg/L, respectively, are required to develop disinfection profiles.

<sup>3</sup> The state may grant 2 year extensions for capital improvements [1412(b)(10)].

## 1.4.2 Timeline for the LT2ESWTR

Figure 1-2 depicts the LT2ESWTR requirements and implementation timeline for states and systems.

**Figure 1-2. Implementation Timeline for the LT2ESWTR**



Notes: The second round of source water sampling begins 108 and 138 months after rule promulgation for large systems and small systems, respectively. For small systems, the second round requirements are the same as the first with respect to monitoring for *E. coli* (or an indicator) and only monitoring for *Cryptosporidium* if *E. coli* or indicator triggers are exceeded.

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## **Section 2**

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# **Resources and Guidance**

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In addition to this Implementation Guidance, a variety of resource materials and technical guidance documents have been prepared by EPA to facilitate understanding and implementing the LT2ESWTR. This section is an overview of each of these resources and includes instructions on how to obtain the documents.

## **2.1 Technical Guidance Manuals**

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EPA developed seven technical guidance manuals to support the LT2ESWTR proposal. These manuals will aid EPA, state agencies, and affected PWSs in implementing this rule and will help ensure that implementation among these groups is consistent.

- The Draft Source Water Monitoring Guidance Manual for Public Water Systems for the LT2ESWTR (EPA 815-D-03-005, June 2003) provides guidance on activities related to *Cryptosporidium* and *E. coli* monitoring under the LT2ESWTR, such as laboratory contracting, sample collection procedures, and data evaluation and interpretation.
- The Draft Microbial Laboratory Manual for the LT2ESWTR (EPA 815-D-03-006, June 2003) provides guidance to laboratories on procedures for analyzing *Cryptosporidium* and *E. coli* samples under the LT2ESWTR to ensure compliance and maximize data quality and consistency.
- The Draft Ultraviolet Disinfection Guidance Manual (EPA 815-D-03-007, June 2003) provides guidance on the validation selection, design, and operation of UV disinfection systems to comply with treatment requirements under the rule. The Excel “*Ultraviolet Disinfection Guidance Manual*” Workbook supplements the manual with calculations and data that may be used to validate a UV reactor.
- The Draft Membrane Filtration Guidance Manual (EPA 815-D-03-008, June 2003) provides guidance on the selection, design, and operation of membrane filtration to comply with treatment requirements under the rule.
- The Draft LT2ESWTR Toolbox Guidance Manual (EPA 815-D-03-009, June 2003) provides guidance on the selection, design, and operation of treatment and management strategies in the LT2ESWTR “microbial toolbox” to comply with treatment requirements under the rule.
- The Guidance on Generation and Submission of Grandfathered *Cryptosporidium* Data for Bin Classification Under the LT2ESWTR (EPA 815-R-03-009, April 2003) provides guidance to PWSs that elect to monitor for *Cryptosporidium* prior to finalization of the LT2ESWTR. The guidance describes how PWSs can perform grandfathered *Cryptosporidium* monitoring such that the results should be equivalent to data generated under the LT2ESWTR and, therefore, acceptable for use in bin classification.
- The Draft Simultaneous Compliance Manual for the Stage 2 DBPR and LT2ESWTR (EPA XXX-X-XX-XXX, Date ) will describe the various potential treatment and operational conflicts that may arise as systems comply with these two rules in addition to other existing rules.

**For more information**, contact EPA's Safe Drinking Water Hotline, (800) 426-4791, or see the Office of Ground Water and Drinking Water Web page. The rule and guidance documents are located at (<http://www.epa.gov/safewater/lt2/index.html>).

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## **2.2 Rule Presentation**

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Presentations that may be useful for workshops on the LT2ESWTR will be available in PowerPoint format on EPA's Web site: <http://www.epa.gov/safewater/XXX>.

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## **2.3 Fact Sheet/Draft Quick Reference Guide**

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A Fact Sheet/Draft Quick Reference Guide for the LT2ESWTR may be useful in conveying basic information to water systems, new personnel, and for educating stakeholders about the rule. The following are stand-alone documents and are included in Appendix C of this guidance:

- ✓ Fact Sheet: Proposed Long Term 2 Enhanced Surface Water Treatment Rule.
- ✓ Proposed Long Term 2 Enhanced Surface Water Treatment Rule: A Draft Quick Reference Guide.

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## **2.4 Q&As**

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Questions and Answers (Q&As) on the LT2ESWTR will be provided in this section. These questions have been asked of EPA through the Safe Drinking Water Hotline, implementation training, or other means.

### **2.4.1 Systems Affected by the LT2ESWTR**

**Q:**

**A:**

### **2.4.2 *Cryptosporidium***

**Q:**

**A:**

### **2.4.3 Disinfection Profiling and Benchmarking**

**Q:**

**A:**



#### **2.4.4 Source Water Microbial Monitoring**

**Q:**

**A:**

#### **2.4.5 Bin Classification**

**Q:**

**A:**

#### **2.4.6 Microbial Toolbox Options**

**Q:**

**A:**

#### **2.4.7 Violations and SDWIS Reporting**

**Q:**

**A:**

#### **2.4.8 Data Reporting and Recordkeeping**

**Q:**

**A:**

#### **2.4.9 Unfiltered Systems**

**Q:**

**A:**

#### **2.4.10 Uncovered Finished Water Reservoirs**

**Q:**

**A:**

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## **Section 3**

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# **State Implementation**

EPA will undertake necessary rule implementation activities during the period of early implementation. During the early implementation period, the state may elect to undertake some, or all of the implementation activities, in cooperation with EPA. This will facilitate continuity of implementation and ensure that system-specific advice and decisions are made with the best available information and are consistent with existing state program requirements.

### 3.1 Overview of Implementation

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The LT2ESWTR applies to all systems using surface water and GWUDI. Requirements and compliance dates differ between system types (i.e., population served and existing treatment). Primacy agencies should clearly define monitoring, reporting, performance, and follow-up requirements to help systems understand how the rule will affect them and what they must do to comply. The main implementation activities for primacy agencies include the following:

- Address special primacy conditions.
- Identify affected systems.
- Communicate LT2ESWTR requirements to affected systems.
- Update data management systems.
- Approve laboratories for *Cryptosporidium* analysis.
- Specify any alternative *E. coli* indicator values for small systems.
- Oversee risk bin assignments.
- Award *Cryptosporidium* treatment credit for primary treatments in place.
- Award *Cryptosporidium* treatment credit for implementation of options from the microbial toolbox.
- Oversee disinfection profiling and benchmarking.

To help the states' implementation efforts, the guidance in this section and in section 4 makes suggestions and provides alternatives that go beyond the minimum primacy agency requirements specified in the subsections of §142.16. Such suggestions are prefaced by “may” or “should” and are to be considered advisory. They are not required elements of states' applications for program revision. Figure 3-1 shows a timeline with system activities on the top and primacy agency activities on the bottom.

**Figure 3-1. Timeline of System and Primacy Agency Activities**

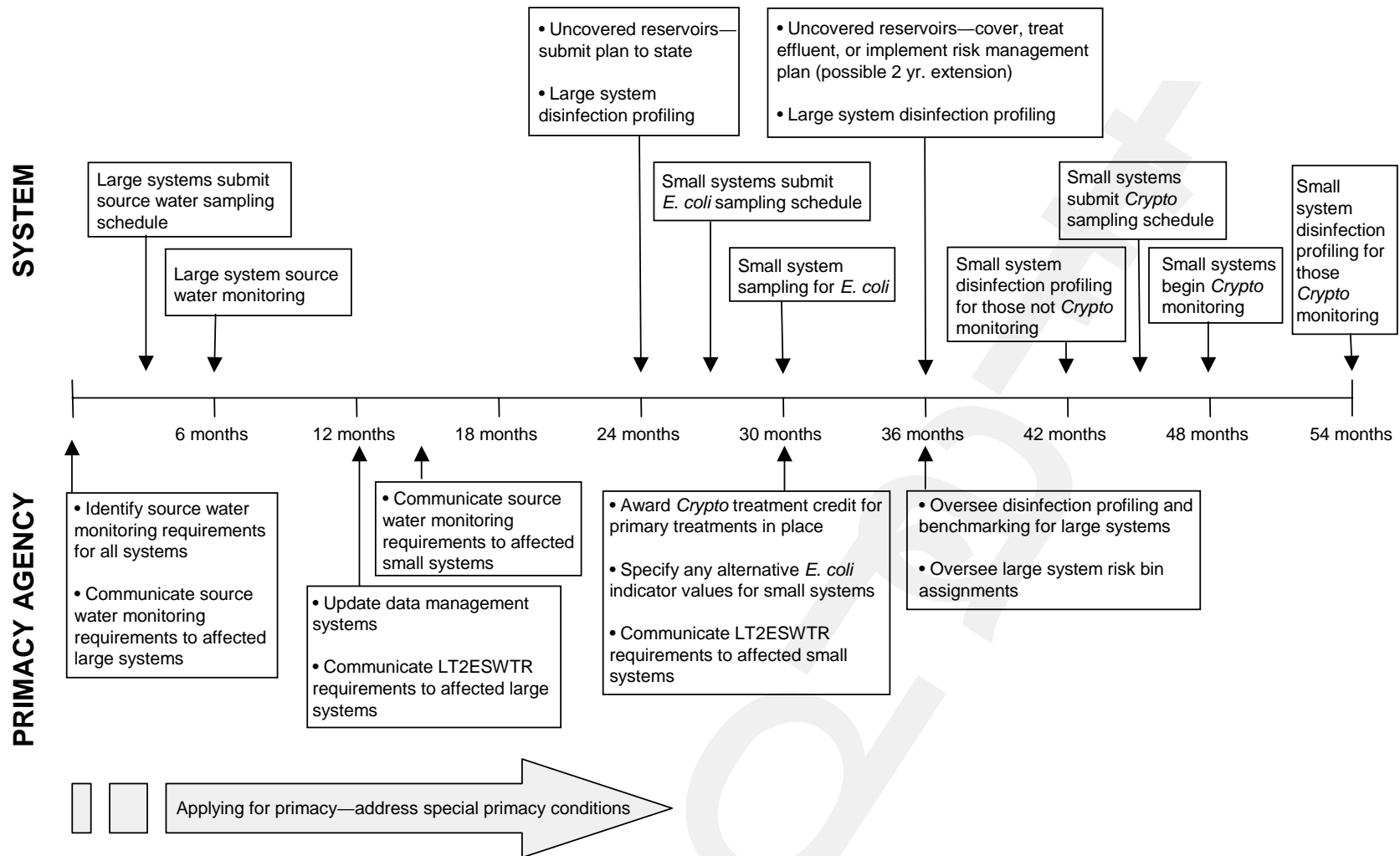
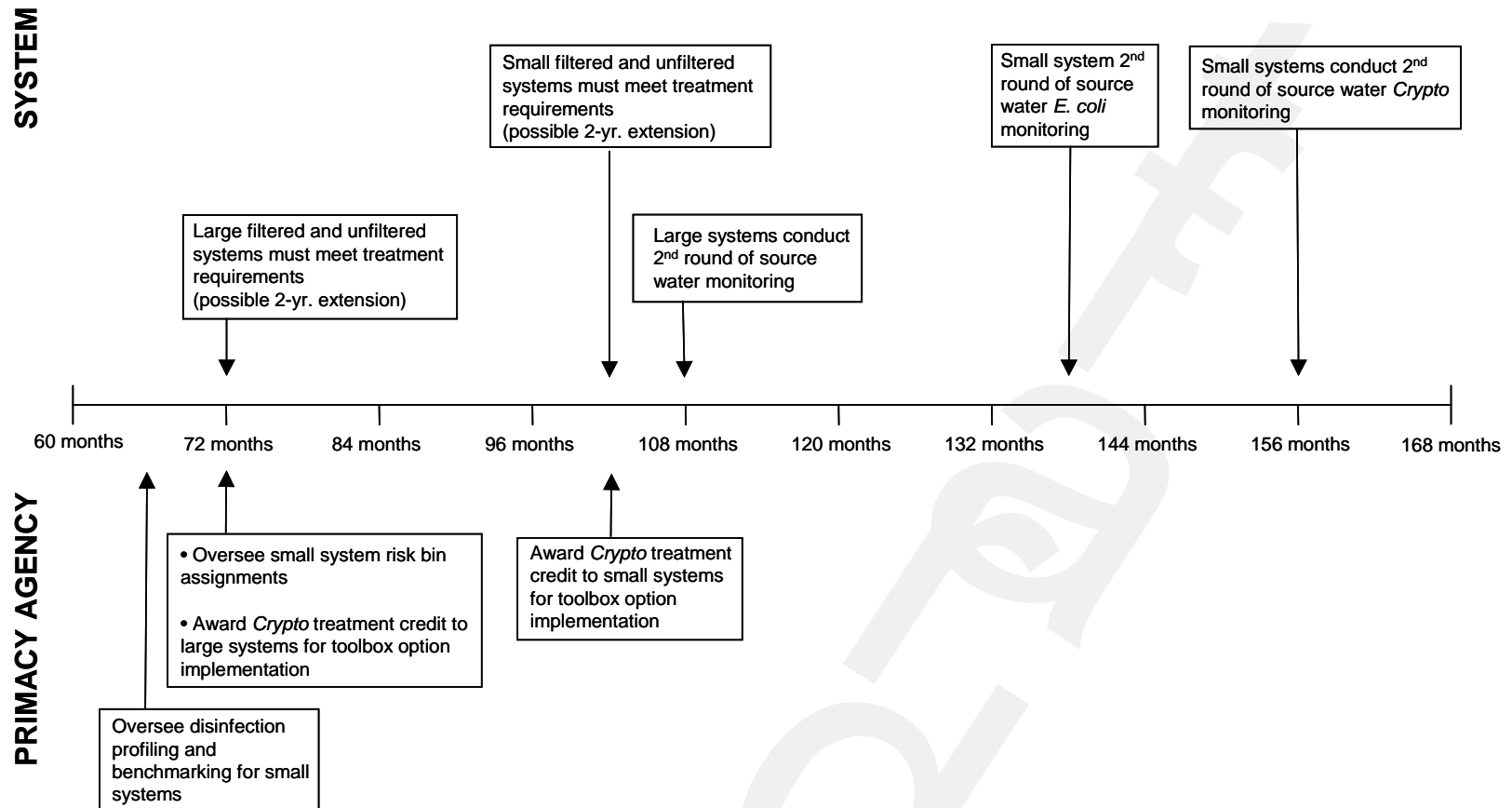


Figure 3-1. Timeline of System and Primacy Agency Activities (cont.)



## 3.2 Identify Special Primacy Conditions

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There are provisions of the LT2ESWTR that allow states discretion in establishing decision-making criteria. The special primacy requirements for the LT2ESWTR, which address the most important discretionary items, are discussed in section 4.4 of this guidance. Although that section describes how a state might satisfy the requirements and obtain primacy, states should inform the systems of their specific requirements with sufficient lead time to meet the compliance dates.

The main provisions for which states must make a timely decision on what they will require of systems include the following:

States must establish criteria for approving watershed control programs for the 0.5 log watershed control program credit in the microbial toolbox. Systems will need to be aware of state criteria in time to decide, 1 year after initial bin assignments, whether they intend to pursue watershed control program treatment credit.

States must establish criteria for determining that a PWS with an uncovered finished water reservoir has a risk mitigation plan that is adequate for purposes of waiving the requirement to cover the reservoir or treat the effluent to achieve 4 log virus inactivation. Systems will need to be aware of state criteria in time to submit proposed risk mitigation plans no later than 2 years after rule promulgation [insert final rule date].

States must establish protocols for awarding *Cryptosporidium* removal credits (both higher and lower) under the demonstration of performance toolbox option. At a minimum, systems will need to know the protocols in enough time to apply for demonstration of performance credit prior to the new treatment requirements go into effect (as early as 6 years after rule promulgation [insert final rule date] for large systems). In the case where a system's request for *Cryptosporidium* removal credits is not accepted by the state, they could be facing a treatment technique violation if there is not enough time to implement another toolbox option.

In addition, states must establish criteria for assessing changes in the watershed and source water during the sanitary survey process.

## 3.3 Identify Affected Systems

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As mentioned previously, the LT2ESWTR applies to all systems that use surface water or GWUDI as a source. The subsections below summarize the four main provisions of the LT2ESWTR (i.e., source water monitoring, treatment, disinfection profiling and bench marking, and uncovered finished reservoirs) as they apply to different system types.

### 3.3.1 Source Water Monitoring

Under the LT2ESWTR, all systems that use surface water or GWUDI as a source are required to conduct source water monitoring for *Cryptosporidium*, *E. coli*, and/or turbidity.

- Large systems (those serving 10,000 or more persons) that filter are required to monitor all three parameters.



- Small systems (those serving fewer than 10,000 people) that filter are required to monitor for *E. coli* initially and, depending on those results, may be required to monitor for *Cryptosporidium*.
- Large and small unfiltered systems are required to monitor for *Cryptosporidium*, unless they elect to provide 3 log *Cryptosporidium* inactivation, on the same schedule as their filtered counterparts.

Previously collected (“grandfathered”) data may be acceptable in some cases in lieu of monitoring, as long as specified criteria are met. Systems that already provide 5.5 log total treatment for *Cryptosporidium*, the maximum treatment level required under the LT2ESWTR, are not required to conduct source water monitoring.

### 3.3.2 *Cryptosporidium* Treatment

For all systems required to conduct source water monitoring, the results of the source water monitoring determine *Cryptosporidium* treatment requirements beyond those required by the IESWTR and LT1ESWTR. As shown in Table 1-3 (see page 29), the lowest “risk bin” for filtered systems does not require any additional treatment. However, unfiltered systems must provide at least 2 log inactivation of *Cryptosporidium* for source water concentration of  $\leq 0.01$  oocyst/L and 3 log for  $>0.01$  oocysts/L.

### 3.3.3 Disinfection Profiling and Benchmarking

The IESWTR and LT1ESWTR required disinfection profiling and benchmarking for CWS and Nontransient Noncommunity Water Systems (NTNCWS) that exceed TTHM or HAA5 levels of 0.064 mg/L and 0.048 mg/L, respectively. Under these rules profiling and benchmarking was calculated for *Giardia lamblia* inactivation and, if using ozone, chloramines, or chlorine dioxide, then virus in addition to *Giardia* inactivation. The LT2ESWTR extends the requirements to all CWS and NTNCWS that must monitor for *Cryptosporidium* (i.e., not only those that exceed the TTHM or HAA5 triggers) and small CWS and NTNCWS that only conduct *E. coli* but exceed the TTHM and HAA5 triggers. In addition, all systems required to conduct disinfection profiling and benchmarking must include virus inactivation under the LT2ESWTR.

Specifically under LT2ESWTR, disinfection profiling and benchmarking applies to CWSs and NTNCWSs that meet any one of the following criteria:

- System that conducts source water monitoring for *Cryptosporidium*.
- TTHM annual average at any one Stage 1 DBPR monitoring location in the distribution system is at least 0.064 mg/L.
- HAA5 annual average at any one Stage 1 DBPR monitoring location in the distribution system is at least 0.048 mg/L.

### 3.3.4 Uncovered Finished Water Reservoirs

The IESWTR and LT1ESWTR prohibited the construction of new uncovered reservoirs for finished water, but did not address existing uncovered reservoirs. The LT2ESWTR requires systems with existing uncovered finished water reservoirs to either cover the reservoir or treat the reservoir discharge to achieve

a 4 log virus inactivation using a protocol approved by the state. However, the system may not have to cover or treat the reservoir if the system develops and implements a state-approved risk mitigation plan.

### 3.4 Communicate LT2ESWTR Requirements to Affected Systems

States should consider notifying PWSs of the source water monitoring and resulting treatment requirements under the LT2ESWTR as soon as possible.

#### 3.4.1 Source Water Monitoring Requirements

Table 3-1 summarizes the source water monitoring requirements and compliance dates for all systems.

**Table 3-1. Source Water Monitoring Requirements and Compliance Dates**

Requirement	Compliance Date
<b>Large filtered systems must monitor their source water for <i>Cryptosporidium</i>, <i>E. coli</i>, and turbidity, and large unfiltered systems must monitor for only <i>Cryptosporidium</i>.<sup>1,2</sup></b>	
Submit sampling schedule	No later than [3 months after promulgation]
Sample/monitor on at least a monthly basis for a 24 month period	Begin no later than [6 months after promulgation]
Conduct second round of source water monitoring on at least a monthly basis for a 24 month period	Begin no later than [108 months after promulgation]
<b>Small filtered systems must first monitor for <i>E. coli</i> or an alternative state-approved indicator of <i>Cryptosporidium</i>.<sup>1,2</sup></b>	
Submit <i>E. coli</i> sampling schedule	No later than [27 months after promulgation]
Sample for <i>E. coli</i> or alternative indicator on at least a biweekly basis for a 12 month period	Begin no later than [30 months after promulgation]
<b>If the average indicator concentration exceeds the trigger level,<sup>3,4</sup> then the filtered system must monitor for <i>Cryptosporidium</i>. Small unfiltered systems must monitor for <i>Cryptosporidium</i>.</b>	
Submit <i>Cryptosporidium</i> sampling schedule	No later than [45 months after promulgation]
Sample for <i>Cryptosporidium</i> at least twice per month for a 24 month period	Begin no later than [48 months after promulgation]
Second round of source water <i>E. coli</i> monitoring <sup>2</sup>	Begin no later than [138 months after promulgation]
Second round of source water <i>Cryptosporidium</i> monitoring	Begin no later than [156 months after promulgation]

<sup>1</sup>Systems may be eligible to use previously collected (grandfathered) data to meet *Cryptosporidium* monitoring requirements if specified quality control criteria are met.

<sup>2</sup>Systems are not required to monitor if they will provide at least 5.5 log *Cryptosporidium* treatment and notify EPA or the state.

<sup>3</sup>Trigger levels are *E. coli* annual mean concentration of 10/100 mL for systems using lakes/reservoir sources and 50/100 mL for systems using flowing stream sources.

<sup>4</sup>Systems that do not exceed the *E. coli* trigger level are classified in bin 1 and are not required to provide *Cryptosporidium* treatment beyond LT1ESWTR levels.

### *Previously Collected Data*

Systems may elect to use *Cryptosporidium* data collected before the system is required to begin monitoring. However, data must meet the quality standards detailed in proposed §141.708(b). Sample collection must meet the following requirements:

- Samples must have been collected at equal time intervals over the collection period (the LT2ESWTR does, however, allow for the collection interval to vary if the system provides documentation of the condition).
- Sampling frequency must be at least monthly.
- Samples collected prior to January 1999 cannot be used.

For previously collected data to be considered, data must be submitted to EPA along with supporting documentation no later than [2 months following rule promulgation]. Systems with partial data (i.e., less than 2 years of data at the time of LT2ESTWR promulgation) may also submit their data for potential credit toward their *Cryptosporidium* monitoring requirements. Such partial data and supporting documentation must be sent to EPA no later than 8 months following rule promulgation [insert final rule date]. In both cases, systems should plan to conduct the monitoring required by the LT2ESWTR until notified in writing by EPA that additional monitoring is not necessary.

#### **3.4.1.1 Calculating Average *Cryptosporidium* Concentrations**

*Cryptosporidium* treatment requirements are determined by the average *Cryptosporidium* concentration observed during source water monitoring. For all unfiltered systems and small filtered systems, the average is the mean of all samples. For large filtered systems, the average differs by the number of samples collected as follows:

- 24 to 47 samples—highest twelve month RAA
- 48 samples or higher—mean of all samples

When determining LT2ESWTR bin classification, systems must calculate individual sample concentrations using the total number of oocysts counted, unadjusted for method recovery, divided by the volume assayed. If no oocysts are found in a sample, then the concentration value for that sample is zero (i.e., not the detection limit). The range of *Cryptosporidium* concentrations that define LT2ESWTR bins reflects consideration of analytical method recovery and the percent of *Cryptosporidium* oocysts that are infectious. Consequently, sample analysis results will not be adjusted for these factors.

Although PWSs are responsible for monitoring and calculating their own bin classification, states should plan on reminding PWSs of the requirements and verifying the calculated bin classifications.

#### **3.4.2 *Cryptosporidium* Treatment Requirements and Compliance Dates**

Systems will use their average *Cryptosporidium* concentration from source water monitoring to determine their bin assignments and additional *Cryptosporidium* treatment requirements. Table 3-2 shows the treatment requirements for filtered systems according to existing treatment processes. Table 3-3 shows the treatment requirements for unfiltered systems.

**Table 3-2. *Cryptosporidium* Treatment Requirements for Filtered Systems**

If the source water <i>Cryptosporidium</i> concentration in oocyst/l is...	And the system uses the following filtration treatment in full compliance with subpart H, P, and T (as applicable), then the additional treatment requirements are. . .			
	Conventional filtration treatment (including softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
<0.075.....Bin 1	None	None	None	None
≥0.0075 and <1.0.....Bin 2	1 log treatment..	1.5 log treatment.....	1 log treatment.....	( <sup>1</sup> )
≥1.0 and <3.0.....Bin 3	2 log treatment...	2.5 log treatment..	2 log treatment.....	( <sup>2</sup> )
≥3.0.....Bin 4	2.5 log treatment...	3 log treatment.....	2.5 log treatment.....	( <sup>3</sup> )

<sup>1</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 4.0 log.

<sup>2</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 5.0 log.

<sup>3</sup> As determined by the state such that the total *Cryptosporidium* removal and inactivation is at least 5.5 log.

**Table 3-3. *Cryptosporidium* Treatment Requirements for Unfiltered Systems**

If the source water <i>Cryptosporidium</i> concentration in oocyst/L is...	<i>Cryptosporidium</i> inactivation with either chlorine dioxide, ozone, or UV
≤0.01	2 log inactivation
>0.01	3 log inactivation

Filtered systems can use at least one of the treatment and management techniques in the “microbial toolbox” (described in section 3.9). Those in bins 3 and 4 must achieve at least 1 log credit towards additional treatment using at least one of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, and UV.

Unfiltered systems are required to use at least two different disinfectants to meet their overall inactivation requirements for viruses (4 log), *Giardia lamblia* (3 log), and *Cryptosporidium* (2 or 3 log). Each of the two disinfectants individually must achieve the total inactivation required for any one of these three pathogen types. For example, a system may use chloramine to meet virus inactivation requirements, UV to meet *Cryptosporidium* inactivation requirements, and any combination of disinfectants to meet *Giardia* requirements.

#### Compliance Dates

Filtered and unfiltered systems must achieve the additional treatment by the following dates:

- Large systems no later than [72 months following rule promulgation].
- Small systems no later than [102 months following rule promulgation].

For systems making capital improvements, states may grant up to 2 additional years to comply.

### 3.4.3 Disinfection Profiling and Benchmarking

Disinfection profiling is conducted over a 12-month period. Table 3-4 shows the activities and dates by which systems must comply.

**Table 3-4. Disinfection Profiling Requirements and Compliance Dates**

System	Requirement and Compliance Date
Large systems	Begin profiling [24 months after rule promulgation]
Small systems not required to monitor for <i>Cryptosporidium</i>	Submit TTHM and HAA5 locational running annual averages to state [42 months after rule promulgation]
Small systems not required to monitor for <i>Cryptosporidium</i> and exceeding TTHM and HAA5 triggers	Begin profiling [42 months after rule promulgation]
Small systems required to monitor for <i>Cryptosporidium</i>	[54 months after rule promulgation]

Previously collected data (i.e., disinfection profiles prepared to satisfy the requirements of the IESWTR or LT1ESWTR) may be used by systems that have not made significant changes in disinfection practices since the data were collected. Systems that developed *Giardia* disinfection profiles, but not virus disinfection profiles, under the IESWTR or LT1ESWTR may calculate virus profiles from the same operational data used to develop the *Giardia* profiles.

Disinfection profiles and benchmarks must be kept on file for the state to review during the Sanitary Survey. In addition, any systems required to develop disinfection profiles for *Giardia* and viruses that plan to make significant changes, as determined by the state, in disinfection practice are required to calculate a benchmark and submit to the state the disinfection profile and an analysis of how the proposed change will affect the current benchmark. The state must grant approval before a system may make any significant change to their disinfection practice.

EPA developed *Disinfection Profiling and Benchmarking Guidance Manuals* (USEPA, 1999) for the IESWTR and LT1ESWTR. These manuals provide instruction to systems and states on the development of disinfection profiles, identification and evaluation of significant changes in disinfection practices, and considerations for setting an alternative benchmark. If necessary, EPA will produce an addendum to reflect changes in the profiling and benchmarking requirements necessary to comply with the LT2ESWTR.

### 3.4.4 Uncovered Finished Water Reservoir Requirements

Systems with uncovered finished reservoirs must cover the reservoir, treat reservoir discharge to 4 log virus inactivation, or have a state-approved risk mitigation plan in place by 36 months after rule promulgation [insert final rule date], with a possibility of a 2-year extension granted by states for systems making capital improvements.

Systems seeking approval for a risk mitigation plan must submit the plan to the state within 24 months following rule promulgation [insert final rule date]. This plan must address physical access and site security, surface water run-off, animal and bird wastes, and on-going water quality assessment, and it must include a schedule for plan implementation. Section 4.4.4 provides guidance to states for developing procedures to evaluate risk mitigation plans.

### **3.4.5 Methods of Communication**

#### **3.4.5.1 Written Notification**

Providing written notice of a final rule for PWSs serves two purposes: 1) the receiving system obtains a formal notice of upcoming regulatory requirements and a timeline for compliance (in addition to EPA's publication of the rule in the *Federal Register*); and 2) the primacy agency has a hard-copy document that it may file and use in subsequent compliance tracking efforts.

Written notification can be in the form of a letter from the state to affected systems. The letter should include a summary of rule requirements and timeframes and direct the reader to an appropriate contact if questions arise. States should consider including fact sheets or other summary materials with the letter. Appendix C of this guidance includes additional draft publications that are intended to be distributed to water systems through mailings, training sessions, or other educational forums. These publications are also available at [www.epa.gov/safewater/mdbp/implement.html](http://www.epa.gov/safewater/mdbp/implement.html). They provide overviews of the LT2ESWTR to help systems understand the provisions of the rule and determine which provisions apply to their system. They also describe the benefits and general implications of the rule. Although valuable, these resources do not substitute for official rule language. States should consider mailing official rule language with the letter or including in the letter the website address where the regulatory language can be accessed.

### Example 3-1. Example System Notification Letter

State Letterhead

John Smith, Supt.  
Town Water System, PWSID XXXXXXXX  
Town, ST 12345

RE: Long Term 2 Enhanced Surface Water Treatment Rule

Dear Mr. Smith:

On [insert date of rule publication], the Long Term 2 Enhanced Surface Water Treatment Rule (abbreviated LT2ESWTR) was published in the *Federal Register*. This letter is being provided to notify you that your public water system may be affected by this rule. You are receiving this letter as our data show your system uses surface water or ground water under the direct influence of surface water (GWUDI) as a source.

The LT2ESWTR applies to all public water systems that use surface water or GWUDI. The LT2ESWTR requires systems to conduct source water monitoring for *Cryptosporidium*, and to take additional protective measures, if warranted by monitoring, using approved treatment techniques in the “microbial toolbox.” The LT2ESWTR also requires most systems to develop disinfection profiles. Finally, the LT2ESWTR requires systems with uncovered finished water reservoirs to cover the reservoirs, treat the effluent, or implement a risk mitigation plan.

Source water monitoring will begin [insert date 6 months after promulgation] for large systems (serving 10,000 people or more) and [insert date 2.5 years after promulgation] for small filtered systems. Sampling schedules must be submitted to the state by each system 3 months before source water monitoring begins. All small unfiltered systems, and those small filtered systems with high *E. coli* levels, will be required to monitor for *Cryptosporidium* starting [insert date 4 years after promulgation]. Compliance with stricter microbial control standards will begin [insert date 6 years after promulgation] for large systems and [insert date 8.5 years after promulgation] for small systems. Large systems will be required to begin disinfection profiling by [insert date 2 years after promulgation] and small systems by [insert dates 3.5 years after promulgation] (or [insert date 4.5 years after promulgation] if they are required to undertake source water monitoring for *Cryptosporidium*). Systems with uncovered finished water reservoirs must cover the reservoirs, treat the effluent, or have a risk mitigation plan approved by [insert date 3 years after promulgation]. Risk mitigation plans for uncovered finished water reservoirs must be submitted to the state at least a year in advance. Some systems may be eligible to meet source water monitoring and disinfection profiling requirements with grandfathered data. Systems making capital improvements may be eligible for a 2-year extension for treatment requirements as well as uncovered finished water reservoir requirements.

A Draft Quick Reference Guide and Fact Sheets for the LT2ESWTR are enclosed. These resources provide more information on specific aspects of this regulation.

Please contact this office at XXX-XXX-XXXX if you have any questions about this letter or the LT2ESWTR and its effect on your system. We appreciate your attention to this request.

Sincerely,

Enclosures: LT2ESWTR Quick Reference Guide, LT2ESWTR Fact Sheet [list other enclosures]



### 3.4.5.2 Slide Presentation

Slide presentations of the LT2ESWTR may be used by state staff and other technical assistants or training providers to present the background of the rule, rule requirements, and its benefits.

The EPA Drinking Water Academy will develop a PowerPoint training session on the LT2ESWTR. Copies of the presentation may be used to train other state personnel and technical assistance resources, water system personnel, and the public. EPA's Drinking Water Academy slides are available electronically on EPA's Web Site at [\[insert Web site address\]](#).

### 3.4.5.3 Guidance Documents and Seminars

Technical guidance documents developed for the LT2ESWTR are useful for conveying rule requirements and specific aspects of rule implementation to state staff and system staff and operators. These aspects include source water monitoring, disinfection profiling and benchmarking, and selecting and implementing options from the microbial toolbox. The guidance documents can be used as stand-alone references or as supporting materials in LT2ESWTR-specific training events. See section 2 of this manual for more information on these references.

## 3.5 Update Data Management Systems

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Although state data management systems vary to suit state-specific requirements and needs, EPA recommends that all states update their data systems in light of the LT2ESWTR to enable efficient tracking of affected systems, compliance status, and other information of use in implementing this rule.

As required under proposed §142.14, records to be kept by states under the LT2ESWTR include the following:

- Results of source water *Cryptosporidium*, *E. coli*, and turbidity monitoring.
- *Cryptosporidium* risk bin classification for each filtered system, including any changes to initial bin classification based on the watershed assessment conducted during the sanitary survey or the second round of monitoring.
- For each unfiltered system, the determination whether the mean source water *Cryptosporidium* level is above 0.01 oocysts/L and whether that determination changes with the second round of monitoring.
- The treatment processes or control measures that each system employs to meet LT2ESWTR requirements, including documentation to demonstrate compliance with required design and implementation criteria.
- A list of systems required to cover or treat the discharge of an uncovered finished water reservoir.
- A list of systems for which the state has waived the requirement to cover or treat the discharge of an uncovered finished water reservoir, along with supporting documentation of the risk mitigation plan.



While many of these records may be maintained through hard-copy files, it may be helpful to have data systems that easily identify systems for which these records exist.

Because source water monitoring by large systems will begin 6 months following promulgation of the LT2ESWTR, EPA expects to act as the primacy agency with oversight responsibility for large system sampling, analysis, and data reporting. To facilitate collection and analysis of large system monitoring data, EPA is developing an internet-based electronic data collection and management system. This approach is similar to that used under the Unregulated Contaminant Monitoring Rule (UCMR). Analytical results for *Cryptosporidium*, *E. coli*, and turbidity will be reported directly to this database using web forms and software that can be downloaded free of charge. EPA will make large system monitoring data available to states when states assume primacy for the LT2ESWTR or earlier under a state agreement with EPA.

### **3.6 Specify Alternative *E. coli* or Indicator Values for Small Systems**

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To reduce the monitoring burden for small systems, the LT2ESWTR requires a 2-phase monitoring strategy for small systems. This approach is based on ICR and Information Collection Rule Supplemental Surveys (ICRSS) data indicating that systems with low source water *E. coli* levels are likely to have low *Cryptosporidium* levels. Under this approach, small systems must initially sample for *E. coli* beginning 30 months after rule promulgation [insert final rule date] and, if above the trigger levels (see section 1.2.2), conduct *Cryptosporidium* monitoring.

As recommended by the Stage 2 M-DBP Advisory Committee, EPA will evaluate *Cryptosporidium* indicator relationships in the LT2ESWTR monitoring data collected by large systems. If these data support the use of different indicator levels to trigger small system *Cryptosporidium* monitoring, EPA will issue guidance with recommendations.

Under the LT2ESWTR, states may also allow use of an alternative indicator for small systems. If states use this option, they should notify small systems of the indicator, trigger values, and acceptable analytical methods.

### **3.7 Ensure that Ongoing Watershed Monitoring is Conducted and Adjust Treatment Requirements**

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Because treatment requirements are related to the degree of source water contamination, the LT2ESWTR contains provisions to assess changes in a system's source water quality following initial risk bin classification. After completion of the initial round of *Cryptosporidium* monitoring, EPA requires that states conduct a follow-up source water assessment as part of the ongoing sanitary survey process. During the sanitary survey, the state must determine whether significant changes have occurred in the watershed that could lead to increased contamination of the source water and what appropriate follow-up action is needed.

Developing a plan to assess the watershed and determine appropriate follow-up action is a special primacy condition of the LT2ESWTR (see section 4.4.1 for guidance to address this special primacy condition).

### 3.8 Award *Cryptosporidium* Removal Credit for Primary Treatments in Place

For conventional treatment systems and slow sand or diatomaceous earth filtration systems, EPA recommends a 3.0 log *Cryptosporidium* removal credit be awarded. For direct filtration systems (which lack a sedimentation basin), EPA recommends a 2.5 log removal credit be awarded. However, EPA is unable to recommend an average log removal credit for alternative filtration technologies like membranes, bag filters, and cartridge filters due to variability among products. As a result, credit for these devices must be determined by the state.

The *Draft Membrane Filtration Guidance Manual* (EPA 815-D-03-008, June 2003) provides guidance for conducting and evaluating challenge tests, as well as routine integrity testing and monitoring requirements to ensure the necessary level of treatment is maintained. Most membrane processes will likely achieve 5.5 log *Cryptosporidium* removal that allows systems to avoid source water monitoring requirements.

The *Draft LT2ESWTR Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides guidance for challenge testing bag and cartridge filters. Note that the guidance is directed towards testing of bag and cartridge filters that follow primary filtration and grant an additional 1 log and 2 log credit. While most of the guidance is still applicable, states should evaluate all aspects of the bag or cartridge filter process with respect to the different source water quality and higher level of removal necessary for primary filtration credit (i.e., 3 log removal).

As described in proposed §141.727, a state may award greater credit to a system that demonstrates through a state-approved protocol that it reliably achieves a higher level of *Cryptosporidium* removal. Conversely, a state may award less credit to a system where the state determines, based on site specific information, that the system is not achieving the degree of *Cryptosporidium* removal indicated in Table 3-5.

**Table 3-5. *Cryptosporidium* Treatment Credit Towards LT2ESWTR Requirements<sup>1</sup>**

Plant type	Conventional treatment (includes softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
Treatment credit	3.0 log	2.5 log	3.0 log	Determined by state

<sup>1</sup> Applies to plants in full compliance with the IESWTR and LT1ESWTR as applicable

### 3.9 Award *Cryptosporidium* Removal Credit for Implementation of Options from the Microbial Toolbox

In order to achieve the *Cryptosporidium* removal requirements of the risk bin categories, systems must supplement the removal credit they receive for primary treatment techniques by implementing options from the microbial toolbox. Each toolbox option is associated with a certain log removal or inactivation credit. Table 3-6 summarizes presumptive credits and associated design and implementation criteria for microbial toolbox components.

**Table 3-6. Microbial Toolbox: Options, Log Credits, and Summary of Design/Implementation Criteria**

<b>Toolbox Option</b>	<b><i>Cryptosporidium</i> log credit with design and implementation criteria</b>
<b>Source Toolbox Components</b>	
Watershed Control Program	0.5 log credit for state-approved program including EPA-specified elements. (Section 3.9.1)
Alternative source/ Intake management	No presumptive credit. Systems may conduct simultaneous monitoring for LT2ESWTR bin classification at alternative intake locations or under alternative intake management strategies. (Section 3.9.2)
<b>Pre-filtration Toolbox Components</b>	
Pre-sedimentation basin with coagulation	0.5 log credit with continuous operation and coagulant addition; basins must achieve 0.5 log turbidity reduction based on the monthly mean of daily measurements from 11 of the 12 previous months; all flow must pass through basins. Systems with existing pre-sed basins must conduct source water monitoring after basins but before any other treatment to determine bin classification and are not eligible for presumptive credit. (Section 3.9.3)
Lime softening	0.5 log additional credit for two-stage softening (single-stage softening is credited as equivalent to conventional treatment). Coagulant must be present in both stages, which may be excess lime or magnesium hydroxide. Both stages must treat 100% of flow. (Section 3.9.4)
Bank filtration (as pretreatment)	0.5 log credit for 25 ft. setback; 1.0 log credit for 50 ft. setback; aquifer must be unconsolidated sand containing at least 10% fines; average turbidity in wells must be < 1 NTU. Systems with existing wells must monitor well effluent to determine bin classification and are not eligible for presumptive credit. (Section 3.9.5)
<b>Treatment Performance Toolbox Components</b>	
Combined filter performance	0.5 log credit for combined filter effluent turbidity $\leq 0.15$ NTU in 95% of samples each month. (Section 3.9.6)
Individual filter performance	1.0 log credit for demonstration of filtered water turbidity < 0.1 NTU in 95 percent of daily max values from individual filters (excluding 15 min period following backwash) and no individual filter > 0.3 NTU in two consecutive measurements taken 15 minutes apart. (Section 3.9.7)
Demonstration of Performance	Credit awarded to unit process or treatment train based on demonstration to the state, through use of a state-approved protocol. (Section 3.9.15)
<b>Additional Filtration Toolbox Components</b>	
Bag filters	1 log credit with demonstration of at least 2 log removal efficiency in challenge test. (Section 3.9.9)
Cartridge filters	2 log credit with demonstration of at least 3 log removal efficiency in challenge test. (Section 3.9.9)

Toolbox Option	<i>Cryptosporidium</i> log credit with design and implementation criteria
Membranes (microfiltration, ultrafiltration, nanofiltration, reverse osmosis)	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. (Section 3.9.8)
Second stage filtration	0.5 log credit for second separate filtration stage; treatment train must include coagulation prior to first filter. (Section 3.9.10)
Slow sand filters	2.5 log credit as a secondary filtration step. No prior chlorination. (Section 3.9.11)
<b>Inactivation Toolbox Components</b>	
Chlorine dioxide	Log credit based on demonstration of compliance with contact time table. (Section 3.9.12)
Ozone	Log credit based on demonstration of compliance with contact time table. (Section 3.9.13)
UV	Log credit based on demonstration of compliance with UV dose table; reactor testing required to establish validated operating conditions. (Section 3.9.14)

Each component is described in more detail in the LT2ESWTR rule language. EPA developed the following draft guidance manuals to assist systems with implementing toolbox components: *UV Disinfection Guidance Manual* (EPA 815-D-03-007, June 2003), *Membrane Filtration Guidance Manual* (EPA 815-D-03-008, June 2003), and *Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003).

States award credit for toolbox options that are satisfactorily implemented. States should be prepared to assist systems in understanding the requirements associated with each toolbox option and selecting appropriate toolbox options. For most options, systems must monitor and/or report operating data to the state, on a monthly basis, verifying proper treatment was achieved. Sections 3.9.1 to 3.9.16 briefly describe each option and the associated requirements.

### 3.9.1 Watershed Control Program [proposed §141.725(a)]

States must approve systems' watershed control programs. Only filtered systems are eligible for watershed control program credits since unfiltered systems are already required to maintain a watershed control program that minimizes the potential for contamination by *Cryptosporidium* as a criterion to avoiding filtration.

States will base their initial approval of a system's watershed control program on their review of the system's proposed watershed control plan and supporting documentation. Their initial approval will be valid until the system completes the second round of *Cryptosporidium* monitoring, which begins approximately 6 years after the initial bin assignment. During this period, states should be aware that the system is responsible for implementing the approved plan and complying with other general requirements, such as an annual watershed survey and program status report. If systems want to continue their eligibility to receive the 0.5 log *Cryptosporidium* treatment credit, they must reapply, and states must approve the program for each subsequent approval period.

### 3.9.1.1 What are the Requirements for Initial State Approval of Watershed Control Programs?

States must receive notification from systems that intend to pursue a 0.5 log *Cryptosporidium* treatment credit for a watershed control program within 1 year following source water monitoring that the system proposes to develop a watershed control plan and submit it for state approval.

States should ensure that systems' applications for initial program approval include the following minimum elements:

- An analysis of the vulnerability of each source to *Cryptosporidium*.
- An analysis of control measures that could address the sources of *Cryptosporidium* contamination identified during the vulnerability analysis.
- A plan that specifies goals and defines and prioritizes specific actions to reduce source water *Cryptosporidium* levels.

States must receive systems' proposed watershed control plan, a request for program approval, and a request for 0.5 log *Cryptosporidium* treatment credit no later than 2 years following source water monitoring.

States will review the system's initial proposed watershed control plan and either approve, reject, or "conditionally approve" the plan. If the plan is approved, or if the system agrees to implement the state's conditions for approval, the system will be awarded 0.5 log credit towards LT2ESWTR *Cryptosporidium* treatment requirements. A final decision on approval should be made no later than 3 years following the system's initial bin assignment. This will give the system 1 year to make changes and resubmit their plan for approval.

The initial state approval of the system's watershed control program can be valid until the system completes the required second round of *Cryptosporidium* monitoring. The system is responsible for taking the required steps to maintain state program approval (described in 3.9.1.2) and the 0.5 log credit during the approval period.

### 3.9.1.2 What are the System's Requirements for Maintaining State Approval of Watershed Control Programs?

After states have approved a system's watershed control program, states should receive the following information from the system within each approval period for the system to continue to be eligible for the 0.5 log *Cryptosporidium* treatment credit:

- An annual watershed control program status report during each year of the approval period.
- An annual state-approved watershed sanitary survey report.
- An application for review and re-approval of the watershed control program and for a continuation of the 0.5 log treatment credit for a subsequent approval period.

The annual watershed control program status report must describe the system's implementation of the approved plan and assess whether the plan achieved its goals. It must explain how the system is addressing any shortcomings in plan implementation, including those previously identified by the state or identified during the watershed survey.

The watershed survey must be conducted according to state guidelines and by persons approved by the state to conduct watershed surveys. The survey must encompass the area of the watershed that was identified in the state-approved watershed control plan as the area of influence and, at a minimum, assess the priority activities identified in the plan and identify any significant new sources of *Cryptosporidium*.

The application for re-approval must be provided to the state at least 6 months before the current period expires or by a date determined by the state. The application must include a summary of activities and issues identified during the previous period and a revised plan to address activities for the next period, including new, actual, or potential source of *Cryptosporidium* and details of any proposed or expected changes from the existing state-approved program.

The annual status reports, watershed control plan, and annual watershed sanitary surveys must be made available to the public upon request. These documents must be in a plain language format and include criteria for evaluating the success of the program in achieving plan goals. The state may withhold portions of the annual status report, watershed control plan, and watershed sanitary survey from the public based on security considerations.

### **3.9.1.3 What Resources are Available to Systems and States?**

Source water assessments conducted by states under section 1453 of the SDWA can provide a foundation for a watershed vulnerability analysis by providing the preliminary analyses of watershed hydrology, a starting point for defining the area of influence, and an inventory and hierarchy of actual and potential contamination sources. In some cases, these portions of the source water assessment may fully satisfy those analytical requirements.

EPA developed the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) to assist water systems in developing their watershed control programs and states in their assessment and approval of these programs. The guidance addresses contamination by *Cryptosporidium* and other pathogens from both non-point sources (e.g., agricultural and urban runoff, septic tanks) and point sources (e.g., sewer overflows, publicly owned treatment works (POTWs), and concentrated animal feeding operations (CAFOs)). In addition, the guidance manual incorporates available information on the effectiveness of different control measures to reduce *Cryptosporidium* levels and provides case studies of watershed control programs. The manual also includes resources available to assist systems in building partnerships and implementing watershed protection activities.

## **3.9.2 Alternative Source [proposed §141.725(b)]**

Plants may be able to reduce influent *Cryptosporidium* levels by changing the intake placement (either within the same source or to an alternate source) or by managing the timing or level of withdrawal. Because the effect of changing the location or operation of a plant intake on influent *Cryptosporidium* levels will be site specific, states may not grant presumptive credit for this option. Rather, if a system is concerned that *Cryptosporidium* levels associated with the current plant intake location and/or operation will result in a bin assignment requiring additional treatment under the LT2ESWTR, the system may

conduct concurrent *Cryptosporidium* monitoring reflecting a different intake location or different intake management strategy.

States should ensure that systems' concurrent monitoring conforms to the sample frequency, sample volume, analytical method, and other requirements that apply to the system for *Cryptosporidium* monitoring. The system must monitor its current plant intake in addition to any alternative intake location or withdrawal strategy, and must submit sampling plans for both strategies to the state 3 months prior to the start of sampling. In addition to all monitoring results, states should also receive supporting information from the system documenting the conditions under which the alternative intake location/management samples were collected. The state will then make a determination as to whether the plant may be assigned to an LT2ESWTR bin using alternative intake location/management monitoring results.

If a plant's bin assignment is based on a new intake operation strategy, it is important for the plant to continue to use this new strategy in routine operation. Therefore, the state must receive documentation from the system on its new intake operation strategy along with additional monitoring results.

### **3.9.3 Pre-sedimentation with Coagulant [proposed §141.726(a)]**

This option is only available to systems without a pre-sedimentation basin at the time of source water monitoring. Systems with pre-sedimentation basins at the time of source water monitoring must sample after the pre-sedimentation basin.

States may grant 0.5 log *Cryptosporidium* treatment credit to a system with a presedimentation process that achieves at least 0.5 log influent turbidity reduction in at least 11 of the 12 previous months, based on the monthly mean of daily turbidity readings. If the presedimentation process has not been in operation for the previous 12 months, then the state must base its determination on the last 12 months of operation and whether influent turbidity reduction in 11 of those months was at least 0.5 log reduction. In addition, the presedimentation process must comply with the following on a monthly basis: (1) continuous operation while basin is in use; (2) treat 100 percent of the plant flow; and (3) continuous addition of a coagulant.

### **3.9.4 Two-stage Lime Softening [proposed §141.726(b)]**

States may grant 0.5 log credit to systems with lime softening plants, depending on the treatment process. Lime softening can be categorized into two general types: (1) single-stage softening that includes a primary clarifier and filtration components; and (2) two-stage softening, which has an additional clarifier located between the clarifier and filter.

In order to grant the 0.5 log credit, the state must ensure that the plant has a second clarification stage between the primary clarifier and filter that is operated continuously and that both clarification stages individually must treat 100 percent of the plant flow. In addition, a coagulant must be present in both clarifiers (the coagulant may be precipitated metal salts).

### **3.9.5 Bank Filtration [proposed §141.726(c)]**

In order for a state to grant a system *Cryptosporidium* treatment credit, its wells must be drilled in an unconsolidated, predominantly sandy aquifer. Wells must also be located at least 25 horizontal feet (in any direction) from the surface water source for 0.5 log credit and at least 50 feet for 1.0 log credit.

Systems must characterize the aquifer by collecting core samples from the surface to at least the bottom of the well screen. From grain analyses, at least 90 percent of the recovered core material must contain at least 10 percent fine-grained material (grains less than 1.0 mm diameter).

Bank filtration devices must be continuously monitored for turbidity at the wellhead. The state must receive notification if a system's monthly average exceeds 1 NTU using the daily maximum turbidity values. The state must determine whether previously allowed credit is still appropriate based on the system's assessment identifying the cause of the high turbidity levels in the well.

### **3.9.6 Combined Filter Performance [proposed §141.727(a)]**

States may grant additional *Cryptosporidium* treatment credit to certain plants (i.e., conventional or direct filtration processes) that maintain finished water turbidity at levels significantly lower than previously required (i.e., 0.3 NTU). Conventional and direct filtration plants may receive an additional 0.5 log towards *Cryptosporidium* treatment requirements if the CFE is less than or equal to 0.15 NTU in at least 95 percent of the measurements taken each month for compliance with the SWTR and IESWTR or LT1ESWTR. Compliance with this criterion must be based on turbidity measurements of the CFE every 4 hours (or more frequently) while the plant system serves water to the public. States may not grant this credit to systems with membrane, bag/cartridge, slow sand, or diatomaceous earth plants, due to the lack of documented correlation between effluent turbidity and *Cryptosporidium* removal in these processes.

### **3.9.7 Individual Filter Performance [proposed §141.727(b)]**

States may grant systems with conventional or direct filtration processes an additional 1.0 log *Cryptosporidium* treatment credit if turbidity measurements collected for IESWTR or LT1ESWTR compliance meet the following turbidity criteria: (1) filtered water turbidity less than 0.1 NTU in at least 95 percent of the maximum daily values recorded at each filter in each month, excluding the 15 minute period following backwashes; and (2) no individual filter has a measured turbidity level greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

States may not grant systems that receive 1 log treatment credit for individual filter performance an additional 0.5 log credit for the CFE option.

### **3.9.8 Membrane Filtration [proposed §141.728(b)]**

To grant removal credit to systems using membrane filtration, states must ensure that the membrane technology is a pressure- or vacuum-driven separation process in which particulate matter larger than 1 µm is rejected by a nonfibrous, engineered barrier, primarily through a size exclusion mechanism. The membrane technology must also allow for routine direct integrity testing while in operation that verifies the removal efficiency demonstrated through challenge testing is being achieved. This definition is intended to include microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

Compliance for a membrane process has three components:

- Challenge test—a test of the membrane's ability to remove introduced *Cryptosporidium* oocysts or surrogates in simulation of operational conditions. Challenge testing is required for specific products and is not intended to be site specific.



- Direct integrity test—Routine testing of each membrane unit that demonstrates removal efficiency equal to or greater than that awarded from the challenge test. Systems must conduct testing at least once per day while in operation and submit a monthly report to the state summarizing all direct integrity test results above the control limit associated with the *Cryptosporidium* removal credit and the corrective action that was taken in each case.
- Indirect integrity monitoring—continuous monitoring of each membrane unit. If direct integrity testing is continuous, systems are not subject to indirect integrity testing requirements.

The removal efficiency demonstrated during challenge testing establishes the maximum removal credit that a membrane filtration process is eligible to receive, provided this value is less than or equal to the maximum log removal value that can be verified by the direct integrity test (a physical test applied to a membrane unit to identify and isolate integrity breaches such as leaks). The state may use its discretion in considering data from challenge studies conducted prior to promulgation of this regulation in lieu of additional testing.

Additional requirements and guidance for conducting the three tests to comply with the LT2ESWTR is provided in the *Draft Membrane Filtration Guidance Manual* (EPA 815-D-03-008, June 2003).

### **3.9.9 Bag and Cartridge Filtration [proposed §141.728(a)]**

States can grant systems using bag and cartridge filters for secondary filtration (i.e., they have a primary filtration process that meets the IESWTR or LT1ESWTR finished water turbidity requirements) a 1 and 2 log *Cryptosporidium* treatment credit, respectively. To be eligible for removal credit, the filtration process must be a pressure driven separation process that removes particulate matter larger than 1 µm using an engineered porous filtration media through either surface or depth filtration. Removal efficiency must be demonstrated through a challenge test conducted on a full-scale bag or cartridge filter.

Challenge testing involves evaluating each bag or cartridge filter for its removal efficiency of *Cryptosporidium* oocysts (or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts). Challenge testing is not required to be site specific; rather, it is intended to be product-specific. Due to the variability in performance, the LT2ESWTR requires bag filters to demonstrate 2.0 log removal for a 1.0 log credit and cartridge filters to demonstrate 3.0 log removal for a 2.0 log credit. States may use their discretion in considering data from challenge studies conducted prior to promulgation of this regulation in lieu of additional testing. Requirements and guidance for conducting challenge studies on bag and cartridge filters are presented in the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003).

### **3.9.10 Second Stage Filtration [proposed §141.728(c)]**

States can grant systems using a second filtration stage an additional 0.5 log *Cryptosporidium* removal credit if the secondary filtration consists of rapid sand, dual media, GAC, or other fine grain media in a separate stage following rapid sand or dual media filtration. A cap, such as GAC, on a single stage of filtration will not qualify for this credit. The first stage of filtration must be preceded by a coagulation step, and both stages must treat 100 percent of the flow.

### 3.9.11 Slow Sand Filters [proposed §141.728(d)]

States can grant systems using slow sand filtration as a *secondary* filtration step following a primary filtration process (e.g., rapid sand or slow sand) an additional 2.5 log *Cryptosporidium* treatment credit. There must be no disinfectant residual in the influent water to the slow sand filtration process, and all flow must be treated by both filtration processes to receive credit.

Note that this proposed credit differs from the credit proposed for slow sand filtration as a *primary* filtration process, where states can grant plants a *Cryptosporidium* removal credit of 3 log for the LT2ESWTR. In other words, slow sand filtration plants are equivalent to conventional filtration plants for the purposes of determining additional treatment requirements for bins 2-4.

While the removal mechanisms that make slow sand filtration effective as a primary filtration process would also be operative when used as a secondary filtration step, EPA has little data on this specific application. The 2.5 log credit for slow sand filtration as a secondary filtration step, in comparison to 3 log credit as a primary filtration process, is a conservative measure reflecting greater uncertainty in its effectiveness. In addition, the 2.5 log credit for slow sand filtration as part of the microbial toolbox is consistent with recommendations in the Stage 2 M-DBP Agreement in Principle.

### 3.9.12 Chlorine Dioxide [proposed §141.729(b)]

Inactivation credit for *Cryptosporidium* is dependent on the “CT” achieved on a daily basis. CT is the product of the disinfectant concentration (“C”) and disinfectant contact time (“T”, in minutes). States must receive calculated CT values from systems for each day, based on measurements of C during peak hourly flow and use the CT values presented in proposed §141.729 and the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003). Systems with several disinfection segments (i.e., a treatment unit process with a measurable disinfectant residual level and a liquid volume) may calculate CT values for each segment and sum those values to obtain a total log inactivation.

Alternatively, states may consider CT values from a system other than those specified in the LT2ESWTR if the system can demonstrate, through the use of a state-approved protocol for on-site disinfection challenge studies, that the CT values are adequate to achieve the inactivation required under the LT2ESWTR. The *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides guidance for conducting a site-specific inactivation study.

### 3.9.13 Ozone [proposed §141.729(c)]

As with chlorine dioxide, the CT values are used to determine the level of *Cryptosporidium* inactivation by ozone disinfection. States should refer to either the rule language or the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) for CT values for various log inactivation credits. This manual also provides guidance on calculating CT values for different disinfection reactor designs and operations.

States may consider CT values from a system other than those specified in the LT2ESWTR if the system can demonstrate, through the use of a state-approved protocol for on-site disinfection challenge studies, that the CT values are adequate to achieve the inactivation required under the LT2ESWTR. The *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides guidance for conducting a site-specific inactivation study.

### 3.9.14 Ultraviolet Light [proposed §141.729(d)]

States may award credit to systems using UV disinfection processes for inactivation of *Cryptosporidium*, *Giardia*, and viruses. To be eligible for UV disinfection credit, the system must demonstrate a delivered UV dose using the results of a reactor validation test and on-line monitoring. Validation testing must determine a range of operating conditions under which the reactor delivers the required UV dose and can be monitored by the system.

- Operating conditions must include flow rate, UV intensity, and lamp status, at a minimum.
- Validated conditions determined by testing must account for UV absorbance of the water, lamp fouling and aging, measurement uncertainty of on-line sensors, UV dose distributions arising from the velocity profiles through the reactor, failure of UV lamps or other critical system components, and inlet and outlet piping or channel configurations of the UV reactor.

UV reactors may be validated for a specific system or validated under a wide range of conditions, thus providing disinfection credit for a variety of applications. Monitoring is used to demonstrate that the system maintains validated operating conditions during routine use. EPA's *Draft UV Disinfection Guidance Manual* (EPA 815-D-03-007, June 2003) provides a protocol for validating reactors and guidance on the design and implementation of UV systems.

The LT2ESWTR presents the UV doses used in validation to receive credit for up to 3 log inactivation of *Cryptosporidium* and *Giardia lamblia* and up to 4 log inactivation of viruses. These dose values are for UV light at a wavelength of 254 nm as delivered by a low pressure mercury vapor lamp and intended for post-filter applications of UV in filtration plants and for systems that meet the filtration avoidance criteria. However, the dose values can be applied to other UV applications (e.g., medium pressure mercury vapor lamps), as described in the *Draft UV Disinfection Guidance Manual* (EPA 815-D-03-007, June 2003).

### 3.9.15 Demonstration of Performance

Where a system can demonstrate that a plant, or a unit process within a plant, achieves a *Cryptosporidium* removal efficiency greater than the presumptive credit specified in the LT2ESWTR, it may be appropriate for the state to grant the system a higher *Cryptosporidium* treatment credit.

States may award a higher level of *Cryptosporidium* treatment credit to a system where the state determines, based on site-specific testing with a state-approved protocol, that a treatment plant (or a unit process within a plant) reliably achieves a higher level of *Cryptosporidium* removal on a continuing basis. Alternatively, states may award a lower level of *Cryptosporidium* treatment credit to a system where a state determines, based on site specific information, that a plant (or a unit process within a plant) achieves a *Cryptosporidium* removal efficiency less than a presumptive credit specified in the LT2ESWTR.

The state may require systems receiving additional *Cryptosporidium* treatment credit, through a demonstration of performance, to report operational data on a monthly basis to establish that the conditions under which demonstration of performance credit was awarded are maintained during routine operation. The *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) will describe potential approaches to demonstration of performance testing.

Note that plants that receive additional *Cryptosporidium* treatment credit through a demonstration of performance are not also eligible for the presumptive credit associated with microbial toolbox components if the additional removal stemming from a toolbox component is captured in the demonstration of performance credit. For example, if a conventional filtration plant receives a demonstration of performance credit higher than the assumed 3.0 log, the plant may not also receive additional presumptive credit for the combined filter effluent toolbox option.

### **3.10 Oversee Disinfection Profiling and Benchmarking**

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The state should review the system's disinfection profiling data during the sanitary survey process. In addition, when a system required to conduct profiling plans to make a significant change to their disinfection process, it must calculate a benchmark and submit it to the state with an evaluation of how the new process will effect the current benchmark. Significant changes in disinfection practice are defined as: 1) moving the point of disinfection (this is not intended to include routine seasonal changes already approved by the state); 2) changing the type of disinfectant; 3) changing the disinfection process; or 4) making other modifications designated as significant by the state.

### **3.11 Review Changes in Treatment or Control Measures Used to Meet *Cryptosporidium* Treatment Requirements**

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Depending on the toolbox option, systems are required to submit plans, testing data, and monitoring results to ensure the additional treatment is appropriate. As described above, systems will submit documentation supporting any change in their disinfection process. States will need to review that documentation and any documentation specific to the toolbox option in a timely manner to ensure a PWS is operating in compliance.

### **3.12 Evaluate Risk Mitigation Plans for Systems with Uncovered Finished Water Reservoirs**

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The LT2ESWTR requires that systems with uncovered finished water reservoirs must: 1) cover the reservoir; 2) treat reservoir discharge to the distribution system to achieve a 4 log inactivation; or 3) receive a state determination that existing risk mitigation is adequate and have a state-approved risk mitigation plan.

Systems that exercise the third option (i.e., do not cover the reservoir or treat the effluent) are required to implement risk mitigation plans. These plans must address physical access and site security, surface water runoff, animal and bird waste, and on-going water quality assessment and must include a schedule for plan implementation. Where applicable, the plans should account for cultural uses by Indian tribes. Systems must cover or treat uncovered finished water reservoirs or have a state-approved risk mitigation plan within 3 years following rule promulgation, [insert final rule date], with the possibility of a 2-year extension granted by states for systems making capital improvements. Systems seeking approval for a risk mitigation plan must submit the plan to the state within 2 years following rule promulgation [insert final rule date].

### 3.13 Approve Laboratories for Monitoring *Cryptosporidium*

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Given the potentially significant implications in terms of both cost and public health protection of microbial monitoring under the LT2ESWTR, analytical work must be accurate and reliable within the limits of approved methods.

Because states do not currently approve laboratories for *Cryptosporidium* analysis and LT2ESWTR monitoring will begin 6 months after rule promulgation [insert final rule date], EPA will initially assume responsibility for *Cryptosporidium* laboratory approval. EPA expects, however, that states will include *Cryptosporidium* analysis in their state laboratory certification programs in the future. EPA has established the Lab QA Program for *Cryptosporidium* analysis to identify laboratories that can meet LT2ESWTR data quality objectives. This is a voluntary program open to laboratories involved in analyzing *Cryptosporidium* in water. Under this program, EPA assesses the ability of laboratories to reliably measure *Cryptosporidium* occurrence with EPA Methods 1622 and 1623 using both performance testing samples and an on-site evaluation.

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## **Section 4**

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# **State Primacy Revision Application**

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Proposed §142 sets out requirements for states to obtain and/or retain primary enforcement responsibility (primacy) for the Public Water System Supervision (PWSS) program as authorized by section 1413 of the Safe Drinking Water Act (SDWA). The 1996 SDWA Amendments update the process for states to obtain and/or retain primacy. On April 28, 1998, EPA promulgated the Primacy Rule to reflect these statutory changes (63 FR 23361).

#### **4.1 State Primacy Program Revision**

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Pursuant to proposed §142.12, Revision of State Programs, complete and final requests for approval of program revisions to adopt new or revised EPA regulations must be submitted to the EPA Administrator no later than 2 years after promulgation of the new or revised federal regulations (see Table 4-1). Until those applications are approved, EPA regions have responsibility for directly implementing the LT2ESWTR. The state and EPA can agree to implement the rule together during this period. However, if a state is eligible for interim primacy it will have full implementation and enforcement authority (once it submits a complete and final revision package). A state may be granted an extension of time, up to 2 years, to submit its application package. During any extension period, an extension agreement outlining the state's and EPA's responsibilities is required.

**Table 4-1. State Rule Implementation and Revision Timetable for the LT2ESWTR**

<b>EPA/State Action</b>	<b>Time Frame</b>
Rule published by EPA	[insert date]
State and region establish a process and agree upon a schedule for application review and approval (optional)	[insert date]
State, at its option, submits <i>draft</i> program revision package including: Preliminary approval request Draft state regulations and/or statutes Regulation Crosswalk	[insert date]
Regional (and Headquarters if necessary) review of draft	Completed within 90 days of state submittal of Draft (Suggested)
State submits a complete and final program revision package including: Adopted State Regulations Regulation Crosswalk § 142.10 Primacy Update Checklist § 142.14 and 142.15 Reporting and Recordkeeping § 142.16 Special Primacy Requirements Attorney General's Enforceability Certification	[insert date]**
EPA final review and determination: Regional Review (program and ORC) Headquarters Concurrence and Waivers (Office of Ground Water and Drinking Water (OGWDW) and Office of Enforcement and Compliance Assurance (OECA))*** Public Notice Opportunity for Hearing EPA's Determination	Completed within 90 days of state submittal of final 45 days region 45 days Headquarters***
Rule Compliance Date	[insert date]*

\* See disclaimer #2.

\*\* EPA suggests submitting an application by [insert date] to ensure timely approval. EPA regulations allow until [insert date] for this submittal. An extension of up to 2 additional years may be requested by the state.

\*\*\* At least one state per region.

#### **4.1.1 The Revision Process**

The approval of state program revisions is recommended to be a two-step process comprised of submission of a draft request (optional) and then submission of a complete and final request for program approval. Figure 4-1 diagrams these processes and their timing.

**Draft Request**—At the state's option, it may submit a draft request for EPA review and tentative determination. The request should contain drafts of all required primacy application materials (with the exception of a draft Attorney General's Statement). A draft request should be submitted within 9 months of rule promulgation. EPA will make a tentative determination on whether the state program meets the applicable requirements. The tentative determination should be made within 90 days.

**Complete and Final Request**—This submission must be in accordance with 40 CFR 142.12(c)(1) and (2) and include the Attorney General’s statement. The state must also include its response to any comments and/or program deficiencies identified in the tentative determination (if applicable). Regions should make states aware that submission of only a final request may make it more difficult for the states to address any necessary changes within the allowable time for state rule adoption.

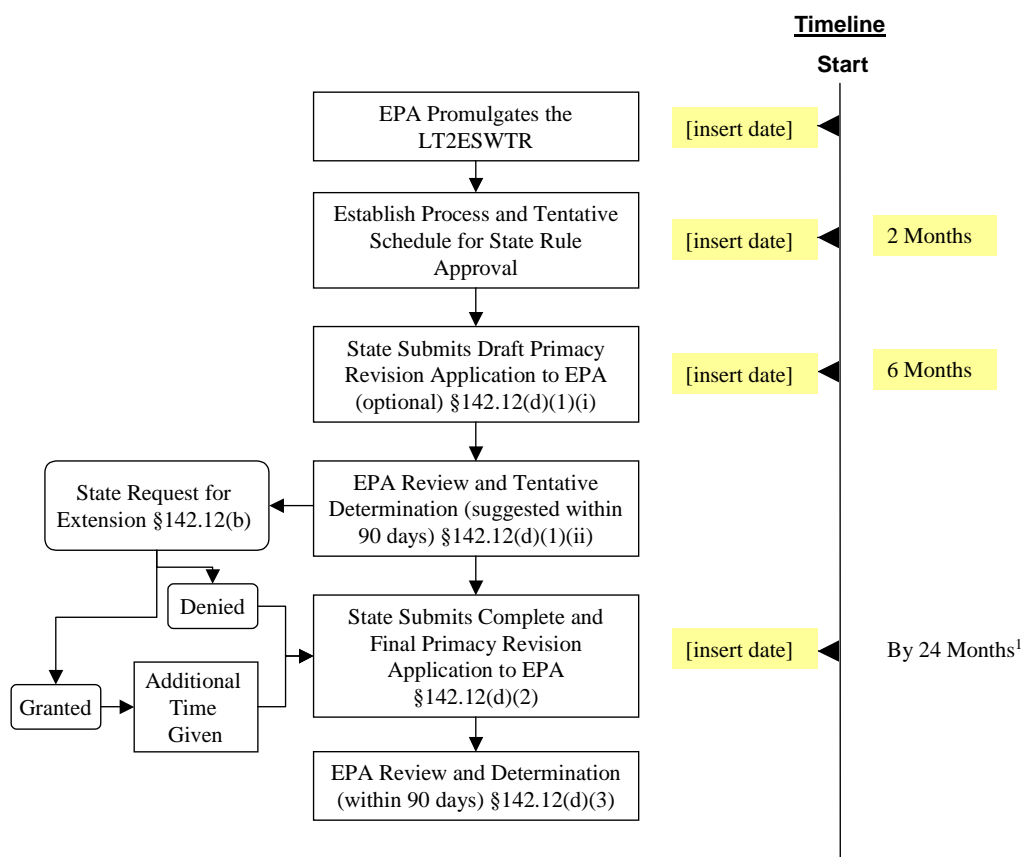
EPA recommends that states submit their complete and final revision package within 21 months of rule promulgation. This will ensure that states will have interim primacy as soon as possible and will prevent states from becoming backlogged with revision applications to adopt future federal requirements.

The state and region should agree to a plan and timetable for submitting the state primacy revision application as soon as possible after rule promulgation—ideally within 5 months of promulgation.

#### **4.1.2 The Final Review Process**

Once a state application is complete and final, EPA has a regulatory (and statutory) deadline of 90 days to review and approve or disapprove of the revised program. OGWDW and OECA will conduct detailed reviews of the first state package from each region. The regional office should submit its comments with the state’s package for review by Headquarters (HQ). When the region has identified all significant issues, OGWDW and OECA will waive concurrence on all other state programs in that region, although EPA HQ will retain the option to review additional state programs as appropriate. The Office of General Counsel has delegated its review and approval to the Office of Regional Counsel (ORC).

**Figure 4-1. Recommended Review Process for State Request for Approval of Program Revisions**



<sup>1</sup> Start date may be extended if State grants system additional time

In order to meet the 90-day deadline for packages undergoing review by HQ, the review period will be equally split by giving the regions and HQ 45 days each to conduct their respective reviews. For the first package in each region, regions should forward copies of the primacy revision applications and their evaluations no later than 45 days after state submittal to the Drinking Water Protection Division Director in OGWDW, who will take the lead on the HQ review process. OGWDW will provide OECA with a copy for their concurrent review.

## 4.2 State Primacy Program Revision Extensions

### 4.2.1 The Extension Process

Under proposed §142.12(b), states may request that the 2-year deadline for submitting the complete and final packages for EPA approval of program revisions be extended for up to 2 additional years in certain circumstances. The extension request must be submitted to EPA within 2 years of the date that EPA published the regulation. The Regional Administrator has been delegated authority to approve extension applications. Concurrence by HQ on extensions is not required.

Therefore, the state must either adopt regulations pertaining to the LT2ESWTR and submit a complete and final primacy revision application or request an extension of up to 2 years by **[insert date: 2 years after rule promulgation]**.

#### **4.2.2 Criteria that an Extension Request Must Meet**

For an extension to be granted under proposed §142.12(b), the state must demonstrate that it is requesting the extension because it cannot meet the original deadline for reasons beyond its control and despite a good faith effort to do so. A critical part of the extension application is the state's proposed schedule for submission of its complete and final request for approval of a revised primacy program. The application must also demonstrate at least one of the following:

- (i) That the state currently lacks the legislative or regulatory authority to enforce the new or revised requirements;
- (ii) That the state currently lacks the program capability adequate to implement the new or revised requirements; or,
- (iii) That the state is requesting the extension to group two or more program revisions in a single legislative or regulatory action.

In addition, the state must be implementing the EPA requirements to be adopted in its program revision within the scope of its current authority and capabilities.

#### **4.2.3 Conditions of the Extension**

Until the State Primacy Revision Application has been submitted, the state and appropriate EPA regional office will share responsibility for implementing the primary program elements as indicated in the extension agreement. The state and the EPA regional office should discuss these elements and address terms of responsibility in the agreement.

These conditions will be determined during the extension approval process and are decided on a case-by-case basis. The conditions must be included in an extension agreement between the state and the EPA regional office.

Conditions of an extension agreement may include:

- Informing PWSs of the new EPA (and upcoming state) requirements and the fact that the region will be overseeing implementation of the requirements until they approve the state program revisions or until the state submits a complete and final revision package if the state qualifies for interim primacy.
- Collecting, storing, and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.
- Assisting the region in the development of the technical aspects of enforcement actions and conducting informal follow-up on violations (e.g., telephone calls, letters, etc.).
- Providing technical assistance to PWSs.

- For states whose request for an extension is based on a current lack of program capability adequate to implement the new requirements, taking steps agreed to by the region and the state to remedy the deficiency during the extension period.
- Providing the region with all the information required under 40 CFR 142.15 on state reporting.

Figure 4-2 provides a checklist the region can use to review state extensions or to create an extension agreement.

Until states have primacy, EPA is the primacy enforcement authority. However, historically states have played a role in implementation for various reasons—most importantly, since states have the local knowledge and expertise and have established relationships with their systems.

The state and EPA should be viewed as partners in this effort, working toward two very specific public health-related goals. The first goal is to achieve a high level of compliance with the regulation. The second goal is to facilitate successful implementation of the regulation during the transition period before the state has primacy, including interim primacy, for the rule. In order to accomplish these goals, education, training, and technical assistance will need to be provided to water suppliers on their responsibilities under the LT2ESWTR.

**Example 4-1. Example Extension Request Checklist**

{Date}

{Regional Administrator}

Regional Administrator

U.S. EPA Region {Region}

{Street Address}

{City, State, Zip}

RE: Request/approval for an Extension Agreement

Dear {Regional Administrator}:

The state of {state} is requesting an extension to the date that final primacy revisions are due to EPA for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) until {insert date - no later than January 2006}, as allowed by 40 CFR 142.12 and would appreciate your approval. Staff of the {State Department/Agency} have conferred with your staff and have agreed to the requirements listed below for this extension. This extension is being requested because the state of {state}:

- ☐ Is planning to group two or more program revisions into a single legislative or regulatory action.
- ☐ Currently lacks the legislative or regulatory authority to enforce the new or revised requirements.
- ☐ Currently lacks adequate program capability to implement the new or revised requirements.

{State Department/Agency} will be working with EPA to implement the LT2ESWTR within the scope of its current authority and capability, as outlined in the six areas identified in 142.12(b)(3)(i-vi):

**i) Informing PWSs of the new EPA (and upcoming state) requirements and the fact that EPA will be overseeing implementation of the requirements until EPA approves the state revision.**

State	EPA	
_____	_____	Provide copies of regulation and guidance to other state agencies, public water supplies (PWSs), technical assistance providers, associations, or other interested parties.
_____	_____	Educate and coordinate with state staff, PWSs, the public, and other water associations about the requirements of this regulation.
_____	_____	Notify affected systems of their requirements under the LT2ESWTR.
_____	_____	Other:

**ii) Collecting, storing and managing laboratory results, public notices, and other compliance and operation data required by the EPA regulations.**

State	EPA	
_____	_____	Devise a tracking system for PWS reporting pursuant to the LT2ESWTR.
_____	_____	Keep PWSs informed of SDWIS reporting requirements during development and implementation.

\_\_\_\_ Report LT2ESWTR violation and enforcement information to SDWIS as required.  
\_\_\_\_ Other:

**iii) Assisting EPA in the development of the technical aspects of the enforcement actions and conducting informal follow-up and violations (telephones calls, letters, etc.).**

State EPA  
\_\_\_\_ Issue notices of violation for treatment technique and monitoring/reporting violations of the LT2ESWTR.  
\_\_\_\_ Provide immediate technical assistance to PWSs with treatment technique and monitoring/reporting violations to try to bring them into compliance.  
\_\_\_\_ Refer all violations to EPA for enforcement if they have not been resolved within 60 days of the incident that triggered the violation. Provide information as requested to conduct and complete any enforcement action referred to EPA.  
\_\_\_\_ Other:

**iv) Providing technical assistance to PWSs.**

State EPA  
\_\_\_\_ Conduct training within the state for PWSs on LT2ESWTR rule requirements.  
\_\_\_\_ Provide technical assistance through written and/or verbal correspondence with PWSs.  
\_\_\_\_ Provide on-site technical assistance to PWSs as requested and needed to ensure compliance with this regulation.  
\_\_\_\_ Coordinate with other technical assistance providers and organization to provide accurate information and aid in a timely manner.  
\_\_\_\_ Other:

**v) Providing EPA with all information prescribed by the State Reporting Requirements in § 142.15.**

State EPA  
\_\_\_\_ Report any violations incurred by PWSs for this regulation each quarter.  
\_\_\_\_ Report any enforcement actions taken against PWSs for this regulation each quarter.  
\_\_\_\_ Report any variances or exemptions granted for PWSs for these regulations each quarter.  
\_\_\_\_ Other:

**vi) For states whose request for an extension is based on a current lack of program capability to implement the new or revised requirements, taking the following steps to remedy the capability deficiency.**

State EPA  
\_\_\_\_ Acquire additional resources to implement these regulations (list of specific steps being taken attached as List A).  
\_\_\_\_ Provide quarterly updates describing the status of acquiring additional resources.  
\_\_\_\_ Other:



I affirm that the {State Department/Agency} will implement provisions of the LT2ESWTR as outlined above.

---

{Agency Director or Secretary}

Date

---

{Name of State Agency}

I have consulted with my staff and approve your extension for the aforementioned regulation. I affirm that EPA Region {Region} will implement provisions of the LT2ESWTR as outlined above.

---

Regional Administrator  
EPA Region {Region}

Date

This Extension Agreement will take effect upon the date of the last signature.

## 4.3 State Primacy Package

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The Primacy Revision Application package should consist of the following sections:

- ☐ State Primacy Revision Checklist
- ☐ Text of the State's Regulation
- ☐ Primacy Revision Crosswalk
- ☐ State Reporting and Recordkeeping Checklist
- ☐ Special Primacy Requirements
- ☐ Attorney General's Statement of Enforceability

### 4.3.1 The State Primacy Revision Checklist

This section is a checklist of general primacy requirements, as shown in Figure 4-3. In completing this checklist, the state must identify the program elements that it has revised in response to new federal requirements. **If an element has been revised the state should indicate a “Yes” answer in the “Revision to State Program” column and should submit appropriate documentation.** For elements that did not require revision, the state need only list the citation and date of adoption in the “Revision to State Program” column. During the application review process, EPA will insert findings and comments in the final column.

The 1996 SDWA Amendments include new provisions for PWS definition and administrative penalty authority. States must adopt provisions at least as stringent as these new provisions, now codified at §142.2 and 142.10. Failure to revise these elements can affect primacy for the LT2ESWTR. However, a state may still receive primacy for the LT2ESWTR even if it has not yet revised its base program to comply with the new statutory requirements, provided that the state has received an extension to adopt these requirements and that this extension period has not expired (as late as **insert date 4 years after rule promulgation**) with full extension).

States may bundle the primacy revision packages for multiple rules. If states choose to bundle requirements, the Attorney General's Statement should reference all of the rules included.

### 4.3.2 Text of the State's Regulation

Each primacy application package should include the text of the state regulation.

### 4.3.3 Primacy Revision Crosswalk

The Primacy Revision Crosswalk in Appendix A should be completed by states in order to identify state statutory or regulatory provisions that correspond to each federal requirement. If the state's provisions differ from federal requirements, the state should explain how its requirements are “no less stringent.”

**Table 4-2. State Primacy Revision Checklist**

Required Program Elements		Revision to State Program	EPA Findings/Comments
§ 141.2	Definitions		
§ 142.10(b)(6)(iii)	Right of entry		
§ 142.10(b)(6)(iv)	Authority to require records		
§ 142.10(b)(6)(v)	Authority to require public notification		
§ 142.10(b)(6)(vi)	Authority to assess civil and criminal penalties		
§ 142.10(b)(6)(vii)	Authority to require Consumer Confidence Reports		
§ 142.10(c)	Maintenance of records		
§ 142.10(d)	Variance/exemption conditions (if applicable)*		
§ 142.10(e)	Emergency plans		
§ 142.10(f)	Administrative Penalty Authority**		

\* New regulations published in the August 14, 1998 *Federal Register*.

\*\* New requirement from the 1996 Amendments. Regulations published in the April 28, 1998 *Federal Register*.

#### 4.3.4 State Reporting and Recordkeeping Checklist [Proposed §142.14 and 142.15]

The state should use the Primacy Revision Crosswalk in Appendix A to demonstrate that state reporting and recordkeeping requirements are consistent with federal requirements. If state requirements are not the same as federal requirements, the state must explain how its requirements are “no less stringent” as per 40 CFR §142.10.

The Primacy Revision Crosswalk includes state reporting and recordkeeping requirements indicating that the state must:

- Keep records of the results of *E. coli* and *Cryptosporidium* monitoring.
- Keep records of the *Cryptosporidium* risk bin classification for each filtered system, including any changes to initial bin classification based on watershed survey or second round of monitoring.
- Keep records of the determination of whether each unfiltered system has a mean source water *Cryptosporidium* level above 0.01 oocysts/L, along with any changes in this determination due to the second round of source water monitoring.
- Keep records of the treatment processes or control measures that each system employs to meet their *Cryptosporidium* treatment requirements.
- Keep a list of systems required to cover or treat the effluent of an uncovered finished water reservoir.

- Keep a list of systems for which the state has waived the requirement to cover or treat the effluent of an uncovered finished water reservoir, along with supporting documentation of the risk mitigation plan.
- Report to EPA the initial bin classification for each system and any changes in bin classifications due to watershed assessment during sanitary surveys or the second round of *Cryptosporidium* monitoring.
- Report to EPA the determination of whether each unfiltered system meeting proposed filtration avoidance criteria has a mean source water *Cryptosporidium* level above 0.01 oocysts/L, along with any changes in this determination due to the second round of source water monitoring.

#### **4.3.5 Special Primacy Requirement [Proposed §142.16]**

Section 4.4 provides guidance on how states may choose to meet the Special Primacy Requirements.

#### **4.3.6 Attorney General's Statement of Enforceability [Proposed §142.12(c)(2)]**

The complete and final primacy revision application must include an Attorney General's Statement certifying that the state regulations were duly adopted and are enforceable (unless EPA has waived this requirement by letter to the state). The Attorney General's Statement should also certify that the state does not have any audit privilege or immunity laws, or if it has such laws, that these laws do not prevent the state from meeting the requirements of SDWA. If a state has submitted this certification with a previous revision package, then the state should indicate the date of submittal, and the Attorney General need only certify that the status of the audit laws has not changed since the prior submittal. An example of an Attorney General's Statement is presented in Figure 4-5.

##### **4.3.6.1 Guidance for States on Audit Privilege and/or Immunity Laws**

In order for EPA to properly evaluate the state's request for approval, the State Attorney General or independent legal counsel should certify that the state's environmental audit immunity and/or privilege and immunity law does not affect its ability to meet enforcement and information gathering requirements under SDWA. This certification should be reasonably consistent with the wording of the state audit laws and should demonstrate how state program approval criteria are satisfied.

EPA will apply the criteria outlined in its "Statement of Principles" memo issued on February 14, 1997, (<http://www.epa.gov/enforcement/planning/state/authorities.html>) to determine whether states with audit laws have retained adequate enforcement authority for any authorized federal programs. The principles articulated in the guidance are based on the requirements of federal law, specifically the enforcement and compliance and state program approval provisions of environmental statutes and their corresponding regulations. The Principles provide that if provisions of state law are ambiguous, it will be important to obtain opinions from the State Attorney General or independent legal counsel interpreting the law as meeting specific federal requirements. If the law cannot be so interpreted, changes to state laws may be necessary to obtain federal program approval. Before submitting a package for approval, states with audit privilege and/or immunity laws should initiate communications with appropriate EPA regional offices to identify and discuss the issues raised by the state's audit privilege and/or immunity law.

**Example 4-2. Example of Attorney General’s Statement**

***Model Language***

I hereby certify, pursuant to my authority as (1) and in accordance with the Safe Drinking Water Act as amended, and (2), that in my opinion the laws of the [State/Commonwealth of (3)] [or tribal ordinances of (4)] to carry out the program set forth in the “Program Description” submitted by the (5) have been duly adopted and are enforceable. The specific authorities provided are contained in statutes or regulations that are lawfully adopted at the time this Statement is approved and signed and will be fully effective by the time the program is approved.

***Model Language***

**I. For States with No Audit Privilege and/or Immunity Laws**

Furthermore, I certify that [State/Commonwealth of (3)] has not enacted any environmental audit privilege and/or immunity laws.

**II. For States with Audit Laws that do Not Apply to the State Agency Administering the Safe Drinking Water Act**

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because the [audit privilege and/or immunity law] does not apply to the program set forth in the “Program Description.” The Safe Drinking Water Act program set forth in the “Program Description” is administered by (5); the [audit privilege and/or immunity law] does not affect programs implemented by (5), thus the program set forth in the “Program Description” is unaffected by the provisions of [State/Commonwealth of (3)] [audit privilege and/or immunity law].

**III. For States with Audit Privilege and/or Immunity Laws that Worked with EPA to Satisfy Requirements for Federally Authorized, Delegated, or Approved Environmental Programs**

Furthermore, I certify that the environmental [audit privilege and/or immunity law] of the [State/Commonwealth of (3)] does not affect the ability of (3) to meet enforcement and information gathering requirements under the Safe Drinking Water Act because [State/Commonwealth of (3)] has enacted statutory revisions and/or issued a clarifying Attorney General’s Statement to satisfy requirements for federally authorized, delegated, or approved environmental programs.

Seal of Office

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and Title

\_\_\_\_\_  
Date

- (1) State Attorney General or attorney for the primacy agency if it has independent legal counsel
- (2) 40 CFR 142.11(a)(6)(i) for initial primacy applications or 40 CFR 142.12(c)(1)(iii) for primacy program revision applications
- (3) Name of state or commonwealth
- (4) Name of tribe
- (5) Name of primacy agency

## 4.4 Guidance for the Special Primacy Requirements of the LT2ESWTR

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To ensure that a state program includes all the elements necessary for an effective and enforceable program under the LT2ESWTR, a state primacy application must include a description of how the state will accomplish the following:

- Assess significant changes in the watershed and source water as part of the sanitary survey process and determine appropriate follow-up action.
- Approve watershed control programs for the 0.5 log watershed control program credit in the microbial toolbox.
- Approve protocols for removal credits under the demonstration of performance toolbox option and for alternative ozone and chlorine dioxide values.
- Determine that a system with an uncovered finished water reservoir has a risk mitigation plan that is adequate for purposes of waiving the requirement to cover the reservoir or treat the reservoir effluent.

This section contains information and guidance that states can use when addressing these special primacy requirements of the LT2ESWTR. The guidance addresses special primacy conditions in the same order that they occur in the rule. Additional information related to these requirements is available in the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003).

### 4.4.1 Assessment of Significant Changes in Watershed and Source Water

*Proposed §142.16 Special primacy requirements. (n):* Requirements for states to adopt proposed §141, subpart W. *In addition to the general primacy requirements elsewhere in this part, including the requirements that state regulations be at least as stringent as federal requirements, an application for approval of a state program revision that adopts proposed §141, subpart W, must contain a description of how the state will accomplish the following program requirements where allowed in state programs. 1) Assess significant changes in the watershed and source water as part of the sanitary survey process and determine appropriate follow-up action.*

#### Guidance

States must conduct sanitary surveys for all surface water and GWUDI systems that assess the condition of eight primary water system components, including the source water (40 CFR 142.10(b)(2) and 142.16(b)). Proposed §142.16(n)(1) requires states to “assess significant changes in the watershed and source water as part of the sanitary survey process and determine appropriate follow-up action.”

During a sanitary survey, the state must assess whether significant changes have occurred in the watershed since the system conducted source water monitoring for bin classification that could lead to increased contamination of the source water. In the cases where a significant change has occurred, states must decide whether corrective measures or additional treatment are needed and determine appropriate follow-up action. States should first suggest that corrective measures be taken to address the source of contamination. Where this is not feasible or not successful, states may reclassify the system into a higher

treatment bin. If a system is re-classified as the result of the sanitary survey, states must report the re-classification to EPA (proposed §142.15).

This guidance discusses three components of the watershed and source water assessment process: preparing for the sanitary survey, conducting the survey, and determining follow-up action.

#### *Preparation for the Survey*

The following aspects of source water protection are discussed in the EPA guidance documents *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)* (EPA 815-R-99-016, April 1999) and *State Source Water Assessment and Protection Programs Guidance*, USEPA (EPA 816-R-97-009, August 1997). The state or state-approved surveyor, should review or address these items before conducting a sanitary survey of a watershed:

- The state source water delineation and assessment for the watershed.
- Historical and current raw water quality records, particularly microbial analyses.
- Water system drawings and design information.
- Water quality violation history.
- Previous sanitary survey reports.
- Complaints received by local, state, and federal agencies regarding water quality or potential contamination within the watershed.
- Updates from local, state, or federal regulatory agencies regarding their monitoring of permitted discharges within the relevant watershed(s) (e.g., NPDES and TMDL programs).
- Updates from state and federal land-management agencies regarding their monitoring of on-going activities within the relevant watershed(s).
- Where applicable, states may also wish to request that the system personnel that were involved in preparation of a watershed control plan accompany the surveyor during the survey.

Where available, the inspector should also review the following information from unfiltered systems or from filtered systems that receive 0.5 log *Cryptosporidium* removal credit for watershed control under the LT2ESWTR:

- The system's watershed control plan.
- The annual watershed control program status reports submitted by the system, where applicable (systems that have received 0.5 log *Cryptosporidium* credit for watershed control under the LT2ESWTR must submit an annual report).

Copies of relevant information should be taken along during the survey. Potential changes in the watershed or source water conditions that are identified from these references should then be evaluated during the survey. States may wish to require that their surveyors take specific equipment (e.g., cameras/camcorders, sampling/analysis equipment, and GPS devices) to document the status of potential threats to water quality. Chapter 2 of the *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)* (EPA 815-R-99-016, April 1999) contains a more detailed list of equipment.

#### *Evaluation During the Survey*

Chapter 3 of the *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)* (EPA 815-R-99-016, April 1999) discusses the source component of a sanitary survey. The following topics are addressed:

- Watershed management program.
- Source vulnerability assessment.
- Source water quality.
- Source water quantity.
- Location of source facilities.
- Capacity of source facilities.
- Design of source facilities.
- Condition of source facilities.
- Transmission of source water.

Also, Chapter 2 of the *Draft Long-Term 2 Enhanced Surface Water Treatment Rule Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides recommendations for implementing the watershed sanitary survey required by the proposed §141.725(a)(4)(ii) and suggests activities to complete during the survey. While these recommendations were developed for systems that have an approved watershed control plan for supplemental *Cryptosporidium* treatment credit, they also address several issues that should be considered when evaluating watersheds.

- Review the effectiveness of the watershed control program to date. (For example, have water quality monitoring results indicated a change in water quality?)
- Identify any new significant actual or potential sources of *Cryptosporidium*.
- Verify and re-evaluate the vulnerability analysis by reviewing the applicability of the area of influence, potential and existing sources of *Cryptosporidium*, monitoring locations and results, and the implementation of control measures.



- Verify that the system has control and practices such control over watershed areas and activities as described in the Watershed Protection Plan.
- Confirm that public access is properly restricted from areas identified in the Watershed Control Plan. Review the means by which the system monitors and enforces restrictions.
- Confirm that fencing and signs have not been vandalized or removed.
- Identify any significant hydrological changes in the watershed that could affect *Cryptosporidium* loading.
- Inspect the intake structure and identify any modifications to its location or design.

Finally, existing vulnerabilities and elements of watershed control plans that require on-going efforts by the system should be evaluated during the survey. High-risk sources should be assessed and discussed with system staff. Site visits to the more critical sources may be appropriate. Development patterns should be reviewed because urban and suburban growth are difficult to control in some areas. Water quality control measures that rely upon “gentlemen’s agreements,” public education, or even best-management practices are often difficult to enforce and should be reviewed for adequacy. Because funding for such efforts are often reduced during tight budgetary conditions, the surveyor may wish to assess such efforts if they are a significant component of watershed protection. The surveyor should also assess whether the system is regularly evaluating the effectiveness of its watershed control program (if one has been implemented).

#### *Follow-up Action*

States should also develop criteria for assessing whether changes within watersheds require corrective measures by the systems. Certain changes *may* warrant immediate action (i.e., changes that can have an immediate impact upon water quality). Examples of those warranting immediate action include:

- Inadequate implementation of best management practices.
- NPDES permit violations at wastewater treatment plants, confined animal feedlot operations, etc.
- Dramatic natural events (floods, forest fires, earthquakes, ice flows, landslides) can transport or expose contaminants (e.g. fine-grained sediments, mining wastes, animal and septic system wastes).
- Prolonged drought conditions may warrant special preparatory measures to minimize impacts from waste accumulations that are washed into source waters when precipitation returns.
- Lack of a current emergency response plan.
- Accidental or illegal waste discharges and spills.

Other changes may not result in immediate impacts, but may still warrant corrective measures to minimize long-term impacts. Examples include the following:

- New NPDES permits or changes in existing NPDES permits that involve increased loading of contaminants.
- Changes in land use patterns.
- Changes in agricultural cropping, chemical application, or irrigation practices.
- Unattended soil erosion.
- Changes in other nonpoint discharge source activities (e.g. grazing, manure application, commercial or residential development).
- Stream or riverbed modifications.
- A watershed public education program that no longer receives adequate funding and/or that has poor stakeholder participation.

As discussed earlier, corrective measures should generally be progressive in nature. In any case, states should have the authority to require corrective measures, and to enforce all original and subsequent conditions of watershed protection. Where land in the watershed is publically owned, state or federal land-management agencies can often help states and systems to implement corrective actions.

Following is a discussion of appropriate follow-up actions from the *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)* (EPA 815-R-99-016, April 1999).

“Deficiencies of a minor nature may require no more response than to notify the system operator of the violation and set a time frame for the operator to correct the situation. A moderate deficiency could prompt the state to require the operator to respond within 30 days with a proposed solution to the deficiency and a schedule for correcting the situation. For significant deficiencies, the state must immediately inform the system operator of the deficiency. In some cases, the deficiency may be such that a boil water notice must be issued to the customers in order to protect public health. In all cases, the state should indicate the required time frame for a response, the required action for the response, and the consequences of failing to respond. The consequences could include revocation of the operating permit, suspension of the permit until the deficiency is corrected, and fines or penalties levied against the system operator. When significant deficiencies exist, a consent agreement, administrative order, or litigation by the appropriate court may be necessary to ensure prompt and proper correction. The state should make regular and continued inspections of the facility until all deficiencies have been corrected ...

The system operator, upon receipt of the sanitary survey report, should prepare a response to the state addressing the survey findings which may include deficiencies of varying degrees of severity. The water system’s response should be returned to the state within 45 days, and must be returned within the 45-day timeframe when the sanitary survey findings include significant deficiencies.”

The *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)* (EPA 815-R-99-016, April 1999) discusses all aspects of sanitary surveys from survey preparation through follow-up compliance activities. In

particular, the manual discusses source water vulnerability, protection, quality, and quantity and evaluation of infrastructure, including the location, design, capacity and condition of critical source water collection facilities. Citations and locations of this manual and other helpful references are listed below.

#### References for more detailed guidance

1. *Draft Long Term 2 Enhanced Surface Water Treatment Rule Toolbox Guidance Manual*. USEPA, 2003. EPA 815-D-03-009. (<http://www.epa.gov/safewater/lt2/guides.html>)
2. *Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI)*. USEPA, 1999. EPA 815-R-99-016. (<http://www.epa.gov/safewater/mdbp/pdf/sansurv/sansurv.pdf>)
3. *Watershed Sanitary Survey Guidance Manual*. Cal-Nevada Section AWWA, 1993. (<http://www.ca-nv-awwa.org/>)
4. *State Source Water Assessment and Protection Programs Guidance*. USEPA, 1997. EPA 816-R-97-009. (<http://www.epa.gov/safewater/source/swpguid.html>)

#### 4.4.2 Approval of Watershed Control Programs

*Proposed §142.16 Special primacy requirements. (n): Requirements for states to adopt proposed §141, subpart W. In addition to the general primacy requirements elsewhere in this part, including the requirements that state regulations be at least as stringent as federal requirements, an application for approval of a state program revision that adopts proposed §141, subpart W, must contain a description of how the state will accomplish the following program requirements where allowed in state programs.*

2) Approve watershed control programs for the 0.5 log watershed control program credit in the microbial toolbox.

#### Guidance

Filtered systems that develop a state-approved watershed control program designed to reduce the level of *Cryptosporidium* in the watershed can receive a 0.5 log credit towards the *Cryptosporidium* treatment requirement of LT2ESWTR. EPA has specified the elements that must be included in a watershed control program to obtain this credit. The required elements are found in proposed §141.725(a) and are briefly described below:

- An analysis of *Cryptosporidium* vulnerability, including characterization of watershed hydrology, identification of the area of influence to be considered in future watershed surveys, identification of both potential and actual sources of *Cryptosporidium* contamination, relative impact of the sources of *Cryptosporidium* on the system's source water, and an estimate of the seasonal variability of the contamination.
- An analysis of control measures that could mitigate contamination.
- A plan that establishes goals and defines and prioritizes specific actions to reduce source water *Cryptosporidium*. The plan must explain expectations, partners and their roles, resource requirements and commitments, and schedule for plan implementation.

Systems must notify the state of their intent to develop a watershed control program. Notification must occur within 1 year of completing source water monitoring requirements of proposed §141.702(b). Systems must submit a proposed initial watershed control plan and a request for plan approval. The proposal is due within 2 years of completing source water monitoring requirements of proposed §141.702(b). The state may approve, reject, or conditionally approve the plan.

To meet this special primacy requirement, states must provide a description of how they will approve a watershed control program for the 0.5 log credit. A key element of the approval would be that the system provides to the state sufficient information to indicate at least 0.5 log reduction of the source water *Cryptosporidium* concentration is feasible through implementation of the watershed control program. If a watershed program is already in place, the description must include additional measures that will be implemented to reduce source water contamination. The description of the state's approach to this approval process should include the elements of the review process as well as criteria for granting approval.

Chapter 2 of the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides information intended to assist systems in developing their watershed control programs and to assist states in assessing these programs. The chapter includes case studies on successful programs, system steps in applying for approval, required components of the program, and suggestions for maintenance of the program. The guidance addresses assessments of plans by the state, including an extensive checklist containing potential assessment criteria that will help states review systems' watershed control plans (Table 2.1 in the *Draft Toolbox Guidance Manual*) and evaluations of annual status reports. EPA is requesting comment and recommendations regarding components that may be included in the checklist. Guidance also includes suggested components of a watershed sanitary survey. An adequate response to this special primacy requirement could include reference to the use of this guidance document for evaluating and approving proposed plans.

In addition to the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003), states may utilize the EPA's new Watershed Initiative to help formulate effective watershed control programs. The Watershed Initiative was conceived to encourage successful community-based approaches to restore, preserve, and protect the nation's watersheds. This is a competitive grant program that provides funding to watershed organizations to encourage the protection and restoration of water resources. EPA plans to select up to 20 watersheds throughout the country for grants to support promising watershed-based approaches to improving water quality. More information on the program as well as criteria for nomination materials and the process for applying for these grant monies are available through the Watershed Initiative website indicated below.

In late 2003, EPA also expects to release a Waterborne Microbial Disease Control Strategy. Objectives of the strategy are to address all important sources of contamination, anticipate emerging problems, and use program and research activities to unite the influences of both the Safe Drinking Water Act and the Clean Water Act on microbial contamination of the nation's waters. A presentation titled, "Developing a Strategy for Waterborne Microbial Disease Control," from the November 6, 2001, Waterborne Microbial Disease Stakeholder Meeting is available at the Web site provided below.

### **References for more detailed guidance**

1. *Draft Long Term 2 Enhanced Surface Water Treatment Rule Toolbox Guidance Manual*. USEPA, 2003. EPA 815-D-03-009. (<http://www.epa.gov/safewater/lt2/guides.html>)

2. EPA Watershed Initiative, as proposed in 67 *FR* 36172, January 15, 2002.  
(<http://www.epa.gov/owow/wtr1/watershed/initiative/background.html>)
3. *Developing a Strategy for Waterborne Microbial Disease Control*. USEPA, 2002.  
(<http://www.epa.gov/ost/humanhealth/microbial/proceedings/strategy/>)

#### **4.4.3 Establishment of Protocols for Approving Removal Credits Under the Demonstration of Performance Toolbox Option**

*Proposed §142.16 Special primacy requirements. (n): Requirements for states to adopt proposed §141, subpart W. In addition to the general primacy requirements elsewhere in this part, including the requirements that state regulations be at least as stringent as federal requirements, an application for approval of a state program revision that adopts proposed §141, subpart W, must contain a description of how the state will accomplish the following program requirements where allowed in state programs. 3) Approve protocols for treatment credits under the demonstration of performance toolbox option and for alternative ozone and chlorine dioxide CT values.*

##### **Guidance**

As discussed in detail in section 3.9.15, when a system can demonstrate that a plant (or a unit process within a plant) achieves a *Cryptosporidium* removal efficiency greater than the presumptive credit specified in the proposed §141.720 and §§141.725 through 141.728 the system may be able to receive a higher *Cryptosporidium* treatment credit based on site-specific testing with a state-approved protocol. The treatment plant (or a unit process within a plant) must reliably achieve a higher level of *Cryptosporidium* removal on a continuing basis. States may also award a lower level of *Cryptosporidium* treatment credit to a system if the state determines, based on site specific information, that a plant or a unit process within a plant achieves a *Cryptosporidium* removal efficiency less than a presumptive credit specified in the LT2ESWTR.

The demonstration of performance toolbox option applies to physical treatment processes including presedimentation, coagulation/flocculation, sedimentation, filtration (including bank filtration and secondary filtration), and two-stage softening. Treatment credit for disinfection processes is based on system performance (i.e., CT values). Under the proposed §141.729, the rule allows systems to develop alternative CT values using a state-approved protocol. Appendix A of the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) provides guidance for conducting *Cryptosporidium* inactivation experiments and determining CT values.

Since demonstration of performance applies to physical removal processes at a treatment plant, systems may not claim presumptive credit for the toolbox options listed below if that component is included in the demonstration of performance credit.

- Presedimentation.
- Two-stage lime softening.
- Bank filtration.
- Combined or individual filter performance.
- Membrane filters.
- Bag and cartridge filters.
- Second stage filtration.

Additionally, some treatment options may enhance *Cryptosporidium* treatment while reducing the effectiveness of other aspects of treatment. For example, optimizing the sedimentation process could reduce removal by the filters, resulting in an overall removal equal to or less than the presumptive credit. Therefore, systems and states should carefully evaluate the overall treatment process in addition to the portion addressed in the demonstration of performance.

As implied above, states must establish criteria for determining how additional credits will be granted. States also have the authority to request additional information not specified by the rule to document that systems are in compliance. The demonstration of performance process for microbial treatment is discussed in Chapter 12 of the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003). Chapter 12 discusses critical aspects of developing and administering a demonstration of performance process, including criteria development and evaluation, testing protocol, monitoring, and reporting. States are encouraged to use the manual in preparing their demonstration of performance program and primacy revision applications.

Systems serving at least 10,000 people must report the results of their demonstration of performance testing to the primacy agency by [insert date 72 months after rule promulgation]. Systems serving less than 10,000 people must report the results of their demonstration of performance testing to the primacy agency by [insert date 102 months after rule promulgation]. If states are interested in this demonstration of performance toolbox option, state primacy regulations should be developed, reviewed, and approved in advance of these deadlines to allow systems adequate time to pursue the option.

#### References for more detailed guidance

*Draft Long Term 2 Enhanced Surface Water Treatment Rule Toolbox Guidance Manual*. USEPA, 2003. EPA 815-D-03-009. (<http://www.epa.gov/safewater/lt2/guides.html>)

#### 4.4.4 Evaluation of Risk Mitigation Plans for Systems with Uncovered Finished Reservoirs

*Proposed §142.16 Special primacy requirements. (n):* Requirements for states to adopt proposed §141, subpart W. *In addition to the general primacy requirements elsewhere in this part, including the requirements that state regulations be at least as stringent as federal requirements, an application for approval of a state program revision that adopts proposed §141, subpart W, must contain a description of how the state will accomplish the following program requirements where allowed in state programs. 4) Determine that a system with an uncovered finished water reservoir has a risk mitigation plan that is adequate for purposes of waiving the requirement to cover the reservoir or treat the reservoir effluent*

#### Guidance

EPA will develop guidance and a simple checklist for the *Draft Toolbox Guidance Manual* (EPA 815-D-03-009, June 2003) that states may use to review systems' risk mitigation plans. EPA is requesting comment and recommendations regarding components that may be included in the checklist.

In states that allow open finished water reservoirs, systems that do not cover an open reservoir or treat the effluent are required to implement risk mitigation plans. Where applicable, the plans should account for cultural uses by Indian tribes. As stated in section 3.13, systems must cover or treat uncovered finished reservoirs or have a state-approved risk mitigation plan within 3 years following rule promulgation [insert final rule date], with the possibility of a 2-year extension granted by states for systems making capital



improvements. Systems seeking approval for a risk mitigation plan must submit the plan to the state within 2 years following rule promulgation [insert final rule date].

Although the reasons for covering reservoirs seem obvious, there may be some situations where an open reservoir can be properly managed without a cover or additional treatment. In these situations, systems should carefully evaluate options before making a final decision. All background information and decisions should be documented. A complete list of operation and maintenance practices, management policies, and standard operating procedures should be developed. Water quality monitoring and record keeping should be included. Staff authority and responsibilities should be defined. Security and emergency response plans should be addressed. This information should be developed for each open reservoir.

Many potential sources of contamination can lead to the degradation of water quality in uncovered finished water reservoirs. These include surface water runoff, algal growth, insects and fish, animal wastes, airborne deposition, groundwater infiltration, and human activity. In order to minimize contamination, systems may implement various controls such as liners, regular draining and washing/disinfection, security equipment, increased water quality monitoring, regular inspections, animal and insect control programs, and drainage design to prevent surface runoff from entering the facility.

A critical component of open reservoir management is animal and insect control. Contamination of open reservoirs has been frequently associated with birds. Although waterfowl species are obvious suspects, non-waterfowl species have also been associated with reservoir contamination. Fish have even been found in open reservoirs. Fencing, bird deterrent wires, noisemakers, regular inspections and cleaning, and animal control ordinances are all commonly used. Seasonal spraying of nearby vegetation for insect control may be appropriate under some circumstances, but should obviously be practiced when risks from aerosol drift are minimal.

Control of unauthorized access by humans is also important. Such access can result in unintentional or intentional contamination. Intentional contamination includes swimming, discarded trash, terrorism (e.g., intentional contamination by introducing a biological or chemical agent), or other wastes. Unintentional contamination includes drift of aerosols, such as pesticides. Fencing, security cameras and lighting, ordinances, and public education are all possible deterrents.

Algae can thrive in open reservoirs without adequate control. Algae can cause taste and odor problems and can also be a precursor to DBP formation where a free chlorine residual is present in the finished water. Common control measures include the addition of water-safe chemicals (e.g. copper sulfate, chlorine dioxide, periodic higher doses of free chlorine, and draining and cleaning).

Groundwater intrusion can also be a problem in uncovered (or covered) reservoirs. Liners are often provided for reservoirs where intrusion is a threat.

Systems may consult the EPA's *Uncovered Finished Water Reservoir Guidance Manual* (EPA 815-R-99-011, 1999) for more detail on the various options.

### References for more detailed guidance

*Uncovered Finished Water Reservoirs Guidance Manual*. USEPA, 1999. EPA 815-R-99-011. (<http://www.epa.gov/safewater/mdbp/implement.html>)

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## **Section 5**

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# **SDWIS Reporting and SNC Definitions**

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## **5.1 Safe Drinking Water Information System (SDWIS) Reporting Under the LT2ESWTR**

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SDWIS/FED (Safe Drinking Water Information System/Federal version) is EPA's national database of routine information about the nation's drinking water. Designed to replace the system known as FRDS (Federal Reporting Data System), SDWIS/FED stores the information EPA needs to monitor approximately 175,000 PWSs.

States supervise drinking water systems within their jurisdictions to ensure that each PWS meets state and EPA standards for safe drinking water. The SDWA requires states to report drinking water information periodically to EPA. This information is maintained in SDWIS/FED.

States report the following information to EPA:

- Basic information on each water system, including: name, ID number, number of people served, type of system (year-round or seasonal), and source of water (ground water or surface water).
- Violation information for each water system: whether it has followed established monitoring and reporting schedules, complied with mandated treatment techniques, or violated any MCLs.
- Enforcement information: what actions states have taken to ensure that drinking water systems return to compliance if they are in violation of a drinking water regulation.
- Sampling results for unregulated contaminants and for regulated contaminants when the monitoring results exceed the MCL.

EPA uses this information to determine if and when it needs to take action against non-compliant systems, oversee state drinking water programs, track contaminant levels, respond to public inquiries, and prepare national reports. EPA also uses this information to evaluate the effectiveness of its programs and regulations and to determine whether new regulations are needed to further protect public health.

### **5.1.1 Federally Reported Violations**

Under SDWIS/FED reporting, states only report when violations occur. In the interest of reducing the reporting burden on states, EPA has limited the number and type of violations to be reported to SDWIS/FED. However, PWSs must still keep records and report all required information to the state. Any violation, whether included in the accompanying table or not, is a basis for a state or federal enforcement action.

Table 5.1 summarizes the violation and contaminant codes that will be used to report violations of the LT2ESWTR to SDWIS/FED.

**Table 5-1. SDWIS/FED Codes for Federal Reporting Under the LT2ESWTR**

<b>Violation Code</b>	<b>Contaminant Code</b>	<b>TT Violations</b>
07	LT2E	Failure to cover or treat the effluent from an uncovered finished water reservoir or implement a state-approved risk-mitigation plan
07	LT2E	Failure to receive approval from the state before making a significant change in disinfection practice
07	LT2E	Failure to provide the level of treatment appropriate for the system's bin classification
07	LT2E	Failure of unfiltered systems to meet TT requirements
		<b>Monitoring and Reporting (M&amp;R) Violations</b>
03	LT2E	Failure to conduct source water monitoring (initial or second round)
03	LT2E	Failure to submit a sampling schedule
03	LT2E	Failure to collect samples in accordance with sampling schedule
03	LT2E	Failure to use required analytical methods
03	LT2E	Failure to use an approved laboratory
03	LT2E	Failure to report results of source water monitoring (initial or second round)
03	LT2E	Failure to conduct disinfection profiling
03	LT2E	Failure to report information to determine if a system must create disinfection
03	LT2E	Failure to report information about toolbox components
		<b>Recordkeeping Violations</b>
09	LT2E	Failure to maintain disinfection profiles
09	LT2E	Failure to maintain source water monitoring and bin classification (initial or second round)

Table 5.2 contains the federally reportable violations for the LT2ESWTR in more detail. These violations are listed by contaminant or requirement and violation type. The table includes the SDWIS/FED reporting codes, the regulatory citation, system type affected, a detailed description of the violation, and the initial compliance date. This table will allow a user to better understand violations listed in SDWIS. For more information on how to report LT2ESWTR violations to SDWIS, please refer to the Appendix D.

**Table 5-2. Federal Reporting for LT2ESWTR**

<b>SDWIS Reporting Code</b>	<b>Regulated Contaminant/ Requirement</b>	<b>Citation</b>	<b>Violation Type</b>	<b>System Size and Type Affected</b>	<b>Violation</b>	<b>Initial Compliance Date</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Treatment Technique Violation</b>						
07/LT2E	Uncovered Finished Water Reservoirs	proposed §141.724	TT	All Subpart H systems with uncovered finished water reservoirs.	Failure to meet one of the three criteria in proposed §141.724(a) regarding uncovered finished water reservoirs.	36 months after the promulgation of the LT2ESWTR.
07/LT2E	Significant Change in Disinfection	proposed §141.714	TT	All Subpart H systems required to prepare a disinfection profile under proposed §141.711 that seek to make a significant change to their disinfection practice.	Making a significant change in disinfection practice without state approval.	Day on which significant change is made or the state learns about the construction.
07/LT2E	Treatment Based on Bin Classification	proposed §141.720	TT	All Subpart H systems that have a bin classification of 2, 3, or 4, or that have not determined their bin classification and do not have at least 5.5 log of <i>Cryptosporidium</i> treatment in place.	Failure to provide the level of treatment appropriate for the system's bin classification and existing treatment.	According to compliance schedule in proposed §141.701(e) for initial round of source water monitoring and in <b>proposed §141.XXX</b> for the second round of source water monitoring.

SDWIS Reporting Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
07/LT2E	Treatment for Unfiltered System	proposed §141.721	TT	All Subpart H systems that do not filter and meet the criteria for avoidance of filtration under 40 CFR 141.71.	Failure of unfiltered system to provide treatment in accordance with proposed §141.721.	According to compliance schedule in proposed §141.701(e) for initial round of source water monitoring and in <b>proposed §141.XXX</b> for the second round of source water monitoring.
<b>Monitoring and Reporting Violations</b>						
03/LT2E	Source Water Testing and Characterization	proposed §141.702	M&R	All Subpart H systems that do not provide a total of 5.5 log treatment for <i>Cryptosporidium</i> before the date they are required to begin source water monitoring.	Failure to conduct source water testing (either initial or second round) and characterize source water as specified in the relevant portion of proposed §141.701 and proposed §141.702.	According to compliance schedules in proposed §141.703(e) and proposed §141.702(d).
03/LT2E	Submitting Sampling Schedule	proposed §141.703(a)	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to submit a sampling schedule that specifies the calendar dates that all samples (initial and second round) required under proposed §141.701-702 will be taken.	3 months before system is required to begin source water monitoring (initial or second round).
03/LT2E	Following Sampling Schedule	proposed §141.703(b)-(d)	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to collect a sample within 2 days of the date indicated in sampling schedule.	2 days after when the system was supposed to collect sample.

SDWIS Reporting Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
03/LT2E	Sampling Location	proposed §141.704	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to sample at required location.	Violations reported based on system's sampling schedule.
03/LT2E	Analytical Methods	proposed §141.705	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to use required methods to analyze source water samples.	2 days after when the system was supposed to collect sample.
03/LT2E	Approved Laboratory	proposed §141.706	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to use approved laboratory to analyze source water samples.	Violations reported based on system's sampling schedule.
03/LT2E	Reporting Source Water Information	proposed §141.707	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to report source water monitoring information as required by proposed §141.707.	10 days after the end of the first month following the month the sample was taken.
03/LT2E	Bin Classification	proposed §141.709	M&R	All Subpart H systems required to conduct source water monitoring.	Failure to properly calculate and specify <i>Cryptosporidium</i> bin classification (initial and second round).	According to compliance schedule in proposed §141.730(c) for the initial round of source water monitoring and according to <b>proposed §141.XXX</b> for the second round of source water monitoring.

SDWIS Reporting Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
03/LT2E	Disinfection Profiling	proposed §141.713	M&R	All Subpart H systems that do not have at least 5.5 log of <i>Cryptosporidium</i> treatment in place by the applicable date in proposed §141.701(e) or small systems that have to monitor for <i>Cryptosporidium</i> , have a TTHM LRAA of $\geq 0.064$ mg/L, or HAA5 LRAA of $\geq 0.048$ mg/L.	Failure to develop <i>Giardia</i> and virus disinfection profiles in accordance with requirements of proposed §141.713.	According to compliance schedule in proposed §141.712(a).
03/LT2E	Toolbox Component Installation and Operation	proposed §141.730(e)	M&R	All Subpart H systems required to provide additional treatment under proposed §141.720.	Failure to provide information regarding proper installation and operation of toolbox components (as specified in proposed §141.725-141.729).	According to compliance schedule in proposed §141.730(e).
03/LT2E	Submitting Reports for Disinfection Profile	proposed §141.711 proposed §141.712(a)	M&R	All Subpart H systems serving <10,000 people that are not required to monitor for <i>Cryptosporidium</i> .	Failure to submit reports necessary to determine if system is or is not required to develop disinfection profile.	42 months after promulgation of the LT2ESWTR.



SDWIS Reporting Code	Regulated Contaminant/ Requirement	Citation	Violation Type	System Size and Type Affected	Violation	Initial Compliance Date
1	2	3	4	5	6	7
<b>Recordkeeping Violations</b>						
09/LT2E	Maintaining Disinfection Profiles	proposed §141.713(d) proposed §141.731(c)	Record-keeping	All Subpart H systems required to conduct Cryptosporidium monitoring under proposed §141.731(c).	Failure to maintain <i>Giardia</i> and virus disinfection profiles on file for state review during sanitary surveys.	When system discards profile or state becomes aware the profiles have been discarded.
09/LT2E	Maintaining Monitoring/Bin Characterization Results	proposed §141.731(a)	Record-keeping	All Subpart H systems required to conduct source water monitoring under proposed §141.731(a).	Failure to keep monitoring and bin characterization results for 36 months after the completion of source water monitoring.	When system discards information or state becomes aware the information has been discarded.

## **5.2 LT2ESWTR - SNC Definition**

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### **Draft SNC Definitions for the LT2ESWTR**

Significant non-compliers (SNCs) are CWSs, NTNCWSs, and TNCWSs that have more serious, frequent, or persistent violations. The criteria that designate a system as a SNC vary by contaminant. Once a system is designated as a SNC, it is subject to EPA's timely and appropriate policy. SNCs that have not returned to compliance or are not addressed timely and appropriately are called Exceptions. Timeliness for SNCs is 8 months after the system became a SNC (2 months for the state to determine and become aware of the system's SNC status and 6 months in which to complete the follow-up/enforcement action). The types of actions considered appropriate include the issuance of a formal state or federal administrative or compliance order, a civil or criminal referral to the state's Attorney General or Department of Justice, or a state bilateral compliance agreement signed by both the state and the violator. The following are SNC definitions for the LT2ESWTR.

NOTE: SNC definitions for the SWTR continue to remain in effect.

**[SNC definitions under development by OECA.]**

## **5.3 LT2ESWTR Data Entry Instructions**

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EPA is developing a draft reporting guidance manual for the LT2ESWTR. This manual will include examples and instruction on determining proper violations and violation codes for the requirements of the LT2ESWTR and will be included in Appendix D.

## **Section 6**

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# **Public Notification and Consumer Confidence Report Examples**

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This section provides examples of violations that systems may incur under the LT2ESWTR. These examples address the public notification and CCR requirements for systems that incur these kinds of violations. Public notification and notification in the CCR are required follow-up activities for violations of the National Primary Drinking Water Regulations. Also included in the examples are sample public notices and sample excerpts from CCR reports that would meet these public notification and CCR requirements. In the public notification samples, the language in italics is required in Appendix B to Subpart Q of proposed §141. The examples in this section are adapted from examples in Appendix D. For more information on SDWIS reporting, refer to this draft manual and the examples contained therein.

## **Example 1: Failure to Take Action on Uncovered Finished Water Reservoir**

### **System Description - System A**

System A is a Subpart H system serving 12,000 people. The system has five finished water reservoirs, two of which are uncovered.

#### Situation

On January 1, 200X [insert date 36 months after rule promulgation], System A submits plans to the state detailing how and when it plans to cover its two uncovered finished water reservoirs.

#### Public Notification and Consumer Confidence Report Requirements

System A has committed a TT violation as a result of the system's failure to have both of its uncovered finished water reservoirs covered within 36 months of LT2ESWTR's promulgation (i.e., by January 1, 200X [insert date 36 months after rule promulgation]). The system could have chosen instead to treat the discharge from its uncovered finished water reservoirs to achieve 4-log virus inactivation or to implement a state-approved risk-mitigation plan. However, since System A failed to implement any of the above options with regard to its finished water reservoirs within 36 months of LT2ESWTR's promulgation, the system is in violation of the LT2ESWTR. System A met the requirements by covering its two uncovered finished reservoirs on January 27, 200X+1 [insert date 48 months following rule promulgation], at which time the system returned to compliance with the LT2ESWTR. This is a treatment technique (TT) violation and requires Tier 2 public notification. The system must provide public notification within 30 days of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. For any unresolved violation following an initial Tier 2 notice, notice must be repeated every 3 months for as long as the violation persists. The system was aware of the violation on January 1, 200X [insert date 36 months after rule promulgation]. Repeat public notification is required in this instance since the violation was not resolved until January 27, 200X+1 [insert date 48 months following rule promulgation].

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-1.

All treatment technique violations must also be included in the CCR. An explanation of how the system returned to compliance could also be included. An example of a report of this violation that could be used in the system's CCR is shown in Example 6-2.

**Example 6-1. Example Tier 2 Public Notification for Failure to Take Action on Uncovered Finished Water Reservoir**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**System A Failed to Take Action on Uncovered Finished Water Reservoir**

Our water system recently violated a standard that requires all finished water reservoirs to be covered. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We were required to cover all uncovered finished water reservoir by January 1, 200X [insert date 36 months after rule promulgation]. However, we have not yet covered our finished water reservoir.

**What should I do?**

There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What does this mean?**

This is not an emergency. If it had been, you would have been notified within 24 hours.

An uncovered reservoir used to store treated water is susceptible to contamination from animals, such as birds. *Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

**What is being done?**

We are developing plans to cover our uncovered finished water storage reservoirs. We expect to have the reservoirs covered by the end of January 200X+1 [insert date 48 months following rule promulgation]. Until our finished water reservoirs are covered, you will receive a notice similar to this every 3 months.

For more information, please contact John Johnson, manager of System A, at 555-1234 or write to 2600 Winding Rd., Townsville, GA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System A.

State Water System ID# GA1234582. Sent: 1/15/200X [insert date 36 months after rule promulgation]

**Example 6-2. Example of a Notice in the CCR for Failure to Take Action on Uncovered Finished Water Reservoir**

<b><u>Water Quality Data</u></b>						
<b>Contaminant</b>	<b>MCL/ MRDL/ TT</b>	<b>MCLG</b>	<b>Value</b>	<b>Date</b>	<b>Violation</b>	<b>Source</b>
<i>Giardia lamblia</i> , Heterotrophic plate count bacteria, <i>Legionella</i> , <i>Cryptosporidium</i>	TT	0		1/1/200X [insert date 36 months after rule promulga tion]	Yes*	Sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

\*System A incurred a treatment technique violation for failing to cover its uncovered finished water storage reservoirs by January 1, 200X [insert date 36 months after rule promulgation]. More information about this violation is provided in the violation section.

**Violation**

- On January 1, 200X [insert date 36 months after rule promulgation] we realized we had failed to comply with a requirement to cover our uncovered finished water storage reservoirs. The standard is that all uncovered finished water storage reservoirs must be covered by January 1, 200X [insert date 36 months after rule promulgation].

An uncovered reservoir used to store treated water is susceptible to contamination from animals, such as birds. Inadequately treated water or contaminated water that has been treated may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

This situation was resolved when we installed covers on the reservoirs on January 27, 200X+1 [insert date 48 months following rule promulgation].



## **Example 2: Failure to Receive Approval Before Making a Significant Change in Disinfection Practice**

### **System Description - System B**

System B is a large Subpart H system serving 109,000 people. It currently uses a conventional filtration treatment plant as defined in 40 CFR 141.2 and chlorinates its water. System B created a disinfection profile under proposed §141.711.

#### Situation

On January 1, 200X [insert date 48 months after rule promulgation], System B submits a plan to the state detailing modifications to its disinfection process that include using ultraviolet (UV) as its primary disinfectant. The plan contains all the elements described in proposed §141.714(a)(6). A month later, without receiving approval of the plan from the state, contractors for System B begin construction necessary to implement the plan.

#### Public Notification and Consumer Confidence Report Requirements

Although System B appropriately prepared the necessary significant disinfection practice modification plan and submitted it to the state by January 1, 200X [insert date 48 months after rule promulgation], it has committed a TT violation as a result of the system's initiation of construction of significant treatment process modifications without receiving approval from the state. The state approved System B's plans on March 1, 200X [insert date 50 months after rule promulgation], returning the system to compliance. This is a treatment technique (TT) violation and requires Tier 3 public notification. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System B is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system learning of the violations. For this particular example, the system became aware of the violations on February 1, 200X [insert date 48 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200X-1 if the CCR is released prior to February 1, 200X+1 (the CCR for calendar year 200X-1 is required to be released by July 1, 200X, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-3. An example of a report of these violations in the CCR is shown in Example 6-4.

**Example 6-3. Example Tier 3 Public Notification for Failure to Receive Approval Before Making a Significant Change in Disinfection Practice**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**

**System B Failed to Receive Approval Before Making a Significant Change in Disinfection Practice**

Our water system recently failed to wait for approval from the state prior to modifying our disinfection practices. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

On January 1, 200X [insert date 48 months after rule promulgation] we submitted to the state, specific information on proposed changes to our disinfection practices, including a description of the proposed change to our disinfection practices, specific disinfection records, and an analysis of how the proposed change would affect the levels of disinfection in our system. However we were required to wait for approval from the state before making any changes to our disinfection practices. On February 1, 200X, our contractors began construction necessary to implement the plan before approval was received from the state.

**What should I do?**

There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What does this mean?**

This is not an emergency. If it had been, you would have been notified within 24 hours.

A change to our disinfection practices without state approval may have impacted our water. *Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.* However, we were not aware of any health effects on you, our customer, as a result of this modification.

**What is being done?**

The state approved our plans on March 1, 200X [insert date 50 months after rule promulgation]. All proposed changes have been implemented.

For more information, please contact John Johnson, manager of System B, at 555-1234 or write to 2600 Winding Rd., Townsville, GA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System B.

State Water System ID# GA1234582. Sent: 3/20/200X [insert date 48 months after rule promulgation]

**Example 6-4. Example of a Notice in the CCR for Failure to Receive Approval Before Making a Significant Change in Disinfection Practice**

<u>Water Quality Data</u>						
Contaminant	MCL/ MRDL/ TT	MCLG	Value	Date	Violation	Source
<i>Giardia lamblia</i> , Heterotrophic plate count bacteria, <i>Legionella</i> , <i>Cryptosporidium</i>	TT			2/1/200X [insert date 48 months after rule promulga tion]	Yes*	Sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

\*System B incurred a treatment technique violation for failing to receive approval before making a significant change to their disinfection practice. More information about this violation is provided in the violation section.

Violation

- On January 1, 200X [insert date 48 months after rule promulgation] we submitted to the state, specific information on proposed changes to our disinfection practices, including a description of the proposed change to our disinfection practices, specific disinfection records, and an analysis of how the proposed change would affect the levels of disinfection in our system. However we were required to wait for approval from the state before making any changes to our disinfection practices. On February 1, 200X, our contractors began construction necessary to implement the plan before approval was received from the state.

A change to our disinfection practices without state approval may have impacted our water. Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches. However, we are not aware of any health effects on you, our customer, as a result of this modification.

We received approval for the changes to our disinfection practices on March 1, 200X [insert date 50 months after rule promulgation]. This violation is now resolved.

### Example 3: Failure to Provide the Level of Treatment Appropriate for Bin Classification

#### System Description - System C

System C is a small Subpart H system using GWUDI and serving 7,500 people. It currently uses a conventional filtration treatment plant as defined in 40 CFR 141.2 and uses chlorine gas as its primary disinfectant.

#### Situation

After System C finishes conducting 12 months of source water monitoring for its initial round on March 1, 200X [insert date 42 months after rule promulgation], the system determines that its *Cryptosporidium* bin concentration is 0.9 oocysts/L, which classifies it as bin 2. System C therefore, needs to provide an additional 1 log of *Cryptosporidium* treatment. System C chooses to install UV disinfection to achieve the necessary treatment credits. Since UV will meet *Giardia* and *Cryptosporidium* requirements, System C will decrease the amount of chlorine. The system is required to submit its plans to the state for approval. After receiving approval of its plan from the state, System C proceeds to install and operate its additional treatment. On March 1, 200X+3.5 [insert date 84 months after rule promulgation], System C installs and begins operating UV disinfection applied as the last step of treatment. Since this treatment is operational before March 1, 200X+5 [within 102 months after promulgation], System C is in compliance with the TT requirement of proposed §141.720.

After conducting a second round of source water monitoring, System C determines that its new *Cryptosporidium* bin concentration is 1.1 oocysts/L, moving System C from bin 2 to bin 3. System C, however, provides no additional treatment for *Cryptosporidium*.

#### Public Notification and Consumer Confidence Report Requirements

System C has committed a TT violation. As a result of the second round of source water monitoring, System C was re-classified into bin 3. Therefore it needed to install an additional 1 log treatment for *Cryptosporidium* in order to meet the 2 log removal requirement (it was already receiving one-log credit for its UV disinfection). System C must install and have additional treatment operating that equals 1 log of *Cryptosporidium* removal by 200X+X [insert date XX months after rule promulgation]. This is a treatment technique (TT) violation and requires Tier 2 public notification. The system must provide public notification within 30 days of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. For any unresolved violation following an initial Tier 2 notice, notice must be repeated every 3 months for as long as the violation persists. The system was aware of the violation on January 1, 200X+X [insert date XX months after rule promulgation]. Repeat public notification is required in this instance since the violation was not resolved until January 27, 200Y [insert date 12 months after 200X+X].

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-5.

All treatment technique violations must also be included in the CCR. An explanation of how the system returned to compliance could also be included. An example of a report of this violation that could be used in the system's CCR is shown in Example 6-6.

**Example 6-5. Example Tier 2 Public Notification for Failure to Provide the Level of Treatment Appropriate for Bin Classification**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**System C Failed to Provide the Level of Treatment Appropriate for Bin Classification**

Our water system failed to provide the level of treatment appropriate for our system's treatment classification until January 27, 200Y [insert date 12 months after 200X+X]. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We are required to install and have additional treatment operating to provide additional *Cryptosporidium* inactivation or removal by 200X+X [insert date XX months after rule promulgation].

**What should I do?**

There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791. If you have specific health concerns, consult your doctor.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What does this mean?**

This is not an emergency. If it had been, you would have been notified within 24 hours.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

**What is being done?**

We are developing plans to install additional treatment that provides additional *Cryptosporidium* inactivation or removal. We expect to have the additional treatment installed by 200Y [insert date 12 months after 200X+X].

For more information, please contact John Johnson, manager of System C, at 555-1234 or write to 2600 Winding Rd., Townsville, GA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System C.

State Water System ID# GA1234582. Sent: 200X+X [insert date XX months after rule promulgation].

**Example 6-6. Example of a Notice in the CCR for Failure to Provide the Level of Treatment Appropriate for Bin Classification**

<u>Water Quality Data</u>						
Contaminant	MCL/ MRDL/ TT	MCLG	Value	Date	Violation	Source
<i>Cryptosporidium</i>	TT	0		200X+X [insert date XX months after rule promulga- tion].	Yes*	
<p>*System C incurred a treatment technique violation for failing to provide the level of treatment appropriate for our system's treatment classification. More information about this violation is provided in the violation section.</p> <p style="text-align: center;"><u><b>Violation</b></u></p> <ul style="list-style-type: none"> <li>Our water system failed to provide the level of treatment appropriate for our system's treatment classification. We are required to install and have additional treatment operating to provide additional <i>Cryptosporidium</i> removal by 200X+X [insert date XX months after rule promulgation].</li> </ul> <p>Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.</p>						



#### **Example 4: Failure to Conduct Source Water Monitoring (Initial or Second Round) and Report the Results**

##### **System Description - System E**

System E is a small Subpart H system serving 3,000 people that uses a small lake as a source. Small systems that provide filtration or are required to provide filtration must initially conduct 1 year of bi-weekly sampling (one sample every 2 weeks) for *E. coli*, beginning no later than **[insert date 30 months after rule promulgation]**. These systems are triggered into *Cryptosporidium* monitoring only if the initial *E. coli* monitoring indicates a mean concentration greater than 10 *E. coli*/100 mL for systems using a reservoir or lake as their primary source. The small systems that exceed these *E. coli* trigger values must conduct 1 year of twice-per-month *Cryptosporidium* sampling beginning **[insert date 48 months after rule promulgation]**.

##### Situation

System E begins conducting *E. coli* monitoring on January 1, 200X **[insert date 30 months after rule promulgation]**. Based on the results of that monitoring, System E determines that its annual mean *E. coli* concentration is 31 *E. coli*/100 mL. System E does not conduct any further source water monitoring.

##### Public Notification and Consumer Confidence Report Requirements

System E has committed a monitoring and reporting (M&R) violation. Based on the annual mean concentration of *E. coli* determined by the initial source water monitoring (31 *E. coli*/100 mL is greater than 10 *E. coli*/100 mL), System E is required to begin source water monitoring for *Cryptosporidium* at least twice each month no later than January 1, 200Y **[insert date 48 months after rule promulgation]**. Not doing so is an M&R violation and leads to the classification of the system into bin 4. This is an M&R violation and the system must provide Tier 3 public notice within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System E is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on February 10, 200Y **[insert date 49 months after rule promulgation]**. The public could therefore be informed of the violation in the CCR produced for calendar year **200Y-1** if the CCR is released prior to February 10, **200Y+1** (the CCR for calendar year **200Y-1** is required to be released by July 1, **200Y**, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year **200Y-1** or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year **200Y**, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-7. An example of a report of this violation in the CCR is shown in Example 6-8.

**Example 6-7. Example Tier 3 Public Notification for Failure to Conduct Source Water Monitoring (Initial or Second Round) and Report the Results**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System E**

Our water system recently failed to conduct additional source water monitoring as required, leading to a violation that began on January 1, 200Y [insert date 48 months after rule promulgation]. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On February 10, 200Y [insert date 49 months after rule promulgation] we began collecting the required source water monitoring samples.

For more information, please contact John Johnson, manager of System E, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System E.

State Water System ID# GA1234589. Sent: April 20, 200Y [insert date 51 months after rule promulgation]

**Example 6-8. Example of a Notice in the CCR for Failure to Conduct Source Water Monitoring (Initial or Second Round) and Report the Results**

**Violation**

- Our water system recently failed to conduct additional source water monitoring as required. We were required to begin source water monitoring for *Cryptosporidium* at least twice each month no later than January 1, 200Y [insert date 48 months after rule promulgation].

On February 10, 200Y [insert date 49 months after rule promulgation] we began collecting the required source water monitoring samples.



### **Example 5: Failure to Submit a Source Water Monitoring Schedule 3 Months Prior to Date System is Required to Begin Monitoring**

#### **System Description - System F**

System F is an unfiltered Subpart H system serving 2,500 people that meets all the criteria for avoiding filtration found in 40 CFR 141.71.

#### Situation

System F submits a sampling schedule to the state for the initial round of source water monitoring January 1, 200X [insert date 45 months after rule promulgation], however, it forgets about the second round of source water monitoring that is required and does not submit a sampling schedule. On February 1, 200Z [insert date 155 months after rule promulgation], 1 month before System F is required to begin the second round of source water monitoring, a neighboring water system reminds System F that it is required to conduct a second round of source water monitoring. System F develops a sampling schedule and fulfills its source water monitoring and reporting requirements in accordance with the schedule in proposed §141.702(d)(3).

#### Public Notification and Consumer Confidence Report Requirements

System F has committed an M&R violation for failing to submit a sampling schedule to the state for the second round of source water monitoring before October 1, 200Y [insert date within 153 months after rule promulgation] (i.e., 3 months before the second round of source water monitoring), even though it conducted the required monitoring and reported the results to the state. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System F is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on February 1, 200Z [insert date 155 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200Z-1 if the CCR is released prior to February 1, 200Z+1 (the CCR for calendar year 200Z-1 is required to be released by July 1, 200Z, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200Z-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200Z, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-9. An example of a report of this violation in the CCR is shown in Example 6-10.

**Example 6-9. Example Tier 3 Public Notification for Failure to Submit a Source Water Monitoring Schedule 3 Months Prior to Date System is Required to Begin Monitoring**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System F**

Our water system recently failed to submit a source water monitoring schedule 3 months before the date we were required to begin the monitoring. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On February 1, 200Z [insert date 155 months after rule promulgation] 1 month before we were required to begin the source water monitoring, we developed a monitoring schedule and fulfilled our source water monitoring and reporting requirements as required.

For more information, please contact John Johnson, manager of System F, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System F.

State Water System ID# GA1234589. Sent: March 20, 200Z [insert date 155 months after rule promulgation]

**Example 6-10. Example of a Notice in the CCR for Failure to Conduct Source Water Monitoring (Initial or Second Round) and Report the Results**

**Violation**

- We failed to submit a source water monitoring schedule 3 months before the date we were required to begin the source water monitoring.

On February 1, 200Z [insert date 155 months after rule promulgation] 1 month before we were required to begin the source water monitoring, we developed a sampling schedule and fulfilled our source water monitoring and reporting requirements as required.

## **Example 6: Failure to Collect Samples in Accordance with Sampling Schedule**

### **System Description - System G**

System G is a small Subpart H system serving 9,000 people.

#### Situation

System G has two qualified operators. While System G is conducting its required source water monitoring for *E. coli*, the operator that usually collects the bi-weekly *E. coli* sample goes on vacation for 1 month. System G's other operator decides to wait until his/her colleague returns to work to continue the required source water monitoring instead of collecting the samples on his/her own.

#### Public Notification and Consumer Confidence Report Requirements

System G has committed an M&R violation for failing to sample within 2 days of the scheduled date, March 1, 200X [insert date 30 months after rule promulgation]. Proposed §141.703(c) allows systems that face “extreme conditions,” situations “that may pose danger to the sampler,” “unforeseen” situations, or situations that “cannot be avoided” to sample as close to the scheduled date as is feasible and to submit an explanation for the alternative sampling date with the analytical results. A vacationing operator does not satisfy any of the requirements of proposed §141.703(c). This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System G is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on March 15, 200X [insert date 30 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200X-1 if the CCR is released prior to March 15, 200X+1 (the CCR for calendar year 200X-1 is required to be released by July 1, 200X, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-11. An example of a report of this violation in the CCR is shown in Example 6-12.

**Example 6-11. Example Tier 3 Public Notification for Failure to Collect Samples in Accordance with Sampling Schedule**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System G**

Our system failed to collect samples in accordance with our sampling schedule. Our system is required to collect bi-weekly source water samples. On March 1, 200X [insert date 30 months after rule promulgation] we failed to take a sample. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On March 15, 200X [insert date 30 months after rule promulgation] we returned to having a full staff of operators and all required samples have been collected since then. This situation is now resolved.

For more information, please contact John Johnson, manager of System G, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System G.

State Water System ID# GA1234589. Sent: June 8, 200X [insert date 30 months after rule promulgation]

**Example 6-12. Example of a Notice in the CCR for Failure to Collect Samples in Accordance with Sampling Schedule**

**Violation**

- We failed to collect samples in accordance with our sampling schedule. Our system is required to collect bi-weekly source water samples. Since we failed to take a sample on March 1, 200X [insert date 30 months after rule promulgation], our results are unknown and, therefore, any potential health effects related to the use of that water are also unknown.

On March 15, 200X [insert date 30 months after rule promulgation] we returned to having a full staff of operators and all required samples have been collected since then. This situation is now resolved.

## Example 7: Failure to Sample at an Appropriate Location

### System Description - System H

System H is a large Subpart H system serving 15,000 people. System H uses bank filtration to meet the requirement of 40 CFR 141.173(b).

#### Situation

On May 1, 200Y [insert date 7 months after rule promulgation], System H begins to conduct monitoring for *Cryptosporidium*. System H collects its first five samples from the well, after bank filtration.

#### Public Notification and Consumer Confidence Report Requirements

System H has committed an M&R violation. Systems using bank filtration as an alternative filtration to meet the *Giardia lamblia* and viruses inactivation and *Cryptosporidium* removal requirements of 40 CFR 141.173(b) or 141.552(a) must take surface water samples. Only unfiltered GWUDI systems meeting the filtration avoidance criteria in 40 CFR 141.71 and bank filtered systems that provide additional filtration can collect samples from the well (after bank filtration). This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System H is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on April 10, 200X [insert date 6 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200X-1 if the CCR is released prior to April 10, 200X+1 (the CCR for calendar year 200X-1 is required to be released by July 1, 200X, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-13. An example of a report of this violation in the CCR is shown in Example 6-14.

**Example 6-13. Example Tier 3 Public Notification for Failure to Sample at an Appropriate Location**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System H**

Our system failed to collect samples at the appropriate location. Our system uses bank filtration to meet the *Giardia lamblia* and virus inactivation and *Cryptosporidium* removal requirements and must take surface water samples. On May 1, 200Y [insert date 7 months after rule promulgation], we began to conduct monitoring for *Cryptosporidium*, however the first five samples collected were collected at the wrong location in the system. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On July 15, 200Z [insert date 9 months after rule promulgation] it was identified that the samples were collected at the wrong location. The sampling location has been corrected and the samples will now be collected at the appropriate location. This situation is now resolved.

For more information, please contact John Johnson, manager of System H, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System H.

State Water System ID# GA1234589. Sent: July 25, 200Z [insert date 9 months after rule promulgation]

**Example 6-14. Example of a Notice in the CCR for Failure to Sample at an Appropriate Location**

**Violation**

- We failed to collect samples at the appropriate location in our system. Our system uses bank filtration to meet the *Giardia lamblia* and viruses inactivation and *Cryptosporidium* removal requirements and must take surface water samples. On May 1, 200Y [insert date 7 months after rule promulgation], we began to conduct monitoring for *Cryptosporidium*, however the first five samples collected were collected at the wrong location in the system.

On July 15, 200Z [insert date 9 months after rule promulgation] it was identified that the samples were collected at the wrong location. The sampling location has been corrected and the samples will now be collected at the appropriate location. This situation is now resolved.



## **Example 8: Failure to Use an Approved Laboratory or Approved Analytical Method**

### **System Description - System I**

System I is a large Subpart H system serving 50,000 people. System I has its own on-site laboratory that has been approved by the state for *Cryptosporidium*, *E. coli*, and turbidity analysis.

#### Situation

System I usually collects its monthly *E. coli* sample on the last Wednesday afternoon of the month and analyzes it the following morning. Overnight the sample is kept at 5°C. During the month of July, however, the operator who usually analyzes the samples was sick on the Thursday following the *E. coli* sample's collection. When the operator returned to work on Friday, the sample was analyzed for *E. coli*.

#### Public Notification and Consumer Confidence Report Requirements

Although the *E. coli* sample was kept between 0°C and 5°C, System I has committed an M&R violation because the sample was not analyzed within 24 hours of its collection. The *E. coli* sample is invalid because the holding time was longer than 24 hours, the maximum holding time allowed by the LT2ESWTR. The system collects and analyzes another sample on August 26, 200X. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System I is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on August 1, 200X. The public could therefore be informed of the violation in the CCR produced for calendar year 200X if the CCR is released prior to August 1, 200X+1. In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-15. An example of a report of this violation in the CCR is shown in Example 6-16.

**Example 6-15. Example Tier 3 Public Notification for Failure to Use an Approved Laboratory or Approved Analytical Method**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System I**

Our system failed to use an approved laboratory or approved analytical method. In July, a water sample was collected and analyzed for *E. coli*, however it was not analyzed within 24 hours of being collected as required. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On August 26, 200X we collected and analyzed all required samples. This situation is now resolved.

For more information, please contact John Johnson, manager of System I, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System I.

State Water System ID# GA1234589. Sent: September 5, 200X

**Example 6-16. Example of a Notice in the CCR for Failure to Use an Approved Laboratory or Approved Analytical Method**

**Violation**

- We failed to use an approved laboratory or approved analytical method. In July, a water sample was collected and analyzed for *E. coli*, however it was not analyzed within 24 hours of being collected as required.

On August 26, 200X we collected and analyzed all required samples. This situation is now resolved.



## Example 9: Failure to Develop *Giardia* and Virus Disinfection Profiles

### System Description - System K

System K is a small GWUDI system serving 4,500 people.

#### Situation

Based on the results of its *E. coli* monitoring, System K was required to conduct source water monitoring for *Cryptosporidium*. However, System K's LRAA for TTHM was less than 0.064 mg/L at every monitoring site, and its LRAA for HAA5 was less than 0.048 mg/L at every monitoring site. Based on these DBP averages, System K determined that it did not need to conduct disinfection profiling.

#### Public Notification and Consumer Confidence Report Requirements

System K has committed an M&R violation. While its DBP levels are below the disinfection profiling triggers, the system is required to conduct source water monitoring for *Cryptosporidium*. Systems serving fewer than 10,000 people are required to create a disinfection profile under the LT2ESWTR by July 1, 200X [insert date 66 months after rule promulgation] if they are required to conduct source water monitoring for *Cryptosporidium* and have not developed a disinfection profile under the LT1ESWTR, or if their LRAAs exceed specified values for TTHM and HAA5. System K developed its disinfection profile and submitted it to the state on October 31, 200X, returning the system to compliance. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System K is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on September 1, 200X. The public could therefore be informed of the violation in the CCR produced for calendar year 200X if the CCR is released prior to September 1, 200X+1. In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-17. An example of a report of this violation in the CCR is shown in Example 6-18.

**Example 6-17. Example Tier 3 Public Notification for Failure to Develop *Giardia* and Virus Disinfection Profiles**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System K**

Our system failed to conduct an analysis of our disinfection practice (profile) and submit the report to the state. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On October 31, 200X [insert date 69 months after rule promulgation] we submitted our disinfection profile to the state. This situation is now resolved.

For more information, please contact John Johnson, manager of System K, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System K.

State Water System ID# GA1234589. Sent: November 1, 200X [insert date 70 months after rule promulgation]

**Example 6-18. Example of a Notice in the CCR for Failure to Develop *Giardia* and Virus Disinfection Profiles**

**Violation**

- Our system failed to conduct an analysis of our disinfection practice (profile) and submit the report to the state.

On October 31, 200X [insert date 69 months after rule promulgation] we submitted our disinfection profile to the state. This situation is now resolved.

## Example 10: Failure to Develop *Giardia* and Virus Disinfection Profiles

### System Description - System L

System L is a small Subpart H system serving 3,000 people. Recently System L, with approval from the state, moved its point of disinfection and began applying chlorine after the sedimentation basin.

#### Situation

Based on the results of source water *E. coli* monitoring, System L is required to monitor for *Cryptosporidium*. As a result, System L is required to create a disinfection profile for *Giardia lamblia* and viruses by July 1, 200X [insert date 66 months after rule promulgation]. System L elects to conduct no additional monitoring to comply with the disinfection profiling requirements of the LT2ESWTR. Instead, it uses data collected prior to the change in point of disinfection (i.e., when the system applied chlorine before flocculation/sedimentation) to create a disinfection profile for viruses in accordance with the methods approved by the state.

#### Public Notification and Consumer Confidence Report Requirements

System L has failed to comply with the disinfection profiling requirements of the LT2ESWTR. While System L did not change sources, it did make a significant change in its treatment practice by moving its point of disinfection in between the time it collected the disinfection profiling data and the time it was required to create a disinfection profile. Therefore, System L has committed an M&R violation since the use of grandfathered data is not acceptable. System L is required to notify the state of its plan to make a significant change in its disinfection practice. Since System L has to monitor for *Cryptosporidium*, it is not required to report data on its TTHM and HAA5 LRAAs. It must, however, receive approval from the state within 54 months of the LT2ESWTR promulgation to use its existing profile. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System L is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on July 15, 200X [insert date 66 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200X if the CCR is released prior to July 15, 200X+1. In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-19. An example of a report of this violation in the CCR is shown in Example 6-20.

**Example 6-19. Example Tier 3 Public Notification for Failure to Develop *Giardia* and Virus Disinfection Profiles**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System L**

Our system failed to use the correct data when developing an analysis of our disinfection practice (profile). We used data collected prior to our changing the point of disinfection (i.e., data from when we applied chlorine before flocculation/sedimentation) to create a disinfection profile for viruses. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On August 15, 200X [insert date 67 months after rule promulgation] we submitted a correct disinfection profile to the state. This situation is now resolved.

For more information, please contact John Johnson, manager of System L, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System L.

State Water System ID# GA1234589. Sent: September 1, 200X [insert date 68 months after rule promulgation]

**Example 6-20. Example of a Notice in the CCR for Failure to Develop *Giardia* and Virus Disinfection Profiles**

**Violation**

- Our system failed to use the correct data when developing an analysis of our disinfection practice (profile). We used data collected prior to our changing the point of disinfection (i.e., data from when we applied chlorine before flocculation/sedimentation) to create a disinfection profile for viruses.

On August 15, 200X [insert date 67 months after rule promulgation] we submitted a correct disinfection profile to the state. This situation is now resolved.

### **Example 11: Failure to Report Information to Determine if a System Must Create a Disinfection Profile**

#### **System Description - System M**

System M uses GWUDI and serves 8,000 people.

#### Situation

Based on monitoring to comply with the Stage 2 DBPR, System M determines that its highest LRAA for TTHM is less than 0.064 mg/L and its highest LRAA for HAA5 is less than 0.048 mg/L. Based on this, System M decides it does not have to create disinfection profiles under the LT2ESWTR. Thinking that all of its obligations are satisfied, System M does not report any information to the state regarding its DBP averages.

#### Public Notification and Consumer Confidence Report Requirements

System M has committed an M&R violation. Every Subpart H system serving fewer than 10,000 people that does not have to monitor for *Cryptosporidium* has to submit a report on its DBP averages to the state no later than July 1, 200X [insert date 42 months after rule promulgation]. Even though System M's DBP averages are below the triggers for disinfection profiling, it still has to report that information to the state. System M finally submits the report to the state on February 1, 200X+1. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System M is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on December 10, 200X [insert date 6 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200X-1 if the CCR is released prior to December 10, 200X+1 (the CCR for calendar year 200X-1 is required to be released by July 1, 200X, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-21. An example of a report of this violation in the CCR is shown in Example 6-22.

**Example 6-21. Example Tier 3 Public Notification for Failure to Report Information to Determine if a System Must Create a Disinfection Profile**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System M**

Our system failed to report information to the state needed for the state to determine if our system must develop an analysis of our disinfection process. Since our system is not required to monitor for *Cryptosporidium*, it had to submit a report on its disinfection byproduct averages to the state no later than July 1, 200X [insert date 42 months after rule promulgation]. Even though our disinfection byproduct averages are below the levels requiring an analysis of our disinfection process, we were still required to report the disinfection byproduct averages to the state. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On February 1, 200X+1 we submitted the report to the state. This situation is now resolved.

For more information, please contact John Johnson, manager of System M, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System M.

State Water System ID# GA1234589. Sent: March 2, 200X+1

**Example 6-22. Example of a Notice in the CCR for Failure to Report Information to Determine if a System Must Create a Disinfection Profile**

**Violation**

- We failed to report information to the state needed for the state to determine if our system must develop an analysis of our disinfection process. Since our system is not required to monitor for *Cryptosporidium*, it had to submit a report on its disinfection byproduct averages to the state no later than July 1, 200X [insert date 42 months after rule promulgation]. Even though our disinfection byproduct averages are below the levels requiring an analysis of our disinfection process, we were still required to report the disinfection byproduct averages to the state.

On February 1, 200X+1 we submitted the report to the state. This situation is now resolved.



## Example 12: Failure to Report Information About Toolbox Components

### System Description - System N

System N is a large Subpart H system serving 35,000 people. It uses a conventional filtration plant and treats its water with chlorine gas.

#### Situation

System N was placed in bin 2 and, therefore, must provide an additional 1 log of treatment. In order to comply with the additional treatment requirements of the LT2ESWTR, System N decides to use UV for primary disinfection and chlorine for secondary disinfection. It submits a proposal outlining the change to its disinfection practice to the state. The report contains all of the information required in proposed §141.714(a)(6). After receiving approval from the state, System N installs a UV reactor validated according to 141.729(d)(3) and operates within conditions determined during validation in January 1, 200X [insert date 48 months after rule promulgation]. After this initial demonstration, System N submits no further information to the state.

#### Public Notification and Consumer Confidence Report Requirements

Although System N installed the necessary treatment before January 1, 200Y [insert date 72 months after rule promulgation], it has committed an M&R violation. System N is required to submit monthly operational reports to the state summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within the conditions required to receive credit for additional *Cryptosporidium* treatment. System N begins submitting monthly operational reports to the state on June 1, 200Y. This is an M&R violation and the system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System N is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on April 20, 200Y [insert date 72 months after rule promulgation]. The public could therefore be informed of the violation in the CCR produced for calendar year 200Y-1 if the CCR is released prior to April 20, 200Y+1 (the CCR for calendar year 200Y-1 is required to be released by July 1, 200Y, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200Y-1 or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200Y, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-23. An example of a report of this violation in the CCR is shown in Example 6-24.

**Example 6-23. Example Tier 3 Public Notification for Failure to Report Information About Toolbox Components**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Monitoring and Reporting Requirements Not Met for System N**

Our system failed to submit monthly operational reports to the state summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within the conditions required to receive credit for additional *Cryptosporidium* treatment. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On April 20, 200Y [insert date 72 months after rule promulgation] we realized we were not submitting the required reports. On June 1, 200Y [insert date 74 months after rule promulgation] the system began submitting monthly operational reports to the state. This situation is now resolved.

For more information, please contact John Johnson, manager of System N, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System N.

State Water System ID# GA1234589. Sent: June 30, 200Y [insert date 74 months after rule promulgation]



**Example 6-24. Example of a Notice in the CCR for Failure to Report Information About Toolbox Components**

**Violation**

- We failed to submit monthly operational reports to the state summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within the conditions required to receive credit for additional *Cryptosporidium* treatment.

On April 20, 200Y [insert date 72 months after rule promulgation] we realized we were not submitting the required reports. On June 1, 200Y [insert date 74 months after rule promulgation] the system began submitting monthly operational reports to the state. This situation is now resolved.

**Example 13: Failure to Maintain Disinfection Profiles**

**System Description - System P**

System P is a large Subpart H system serving 41,000 people.

**Situation**

System P created a disinfection profile for *Giardia lamblia* and for viruses under the provisions of the IESWTR. After receiving state approval to use its existing profile to satisfy the profiling requirements of the LT2ESWTR, System P discards its profiling data on January 1, 200X. It reasoned that, because the state had already reviewed the profiles in two sanitary surveys in between the promulgation of the IESWTR and the LT2ESWTR, it no longer needed to retain that information.

**Public Notification and Consumer Confidence Report Requirements**

System P has committed a recordkeeping violation. Systems must retain their disinfection profiles and the underlying data indefinitely. This requirement is not only to allow states to review the data during sanitary surveys, but if the system ever makes a significant change in disinfection practice, the profiling data will be needed to create a disinfection benchmark. The system obtained copies of their missing data from the state on June 1, 200X. The system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System P is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on May 20, 200X. The public could therefore be informed of the violation in the CCR produced for calendar year 200X-1 if the CCR is released prior to May 20, 200X+1 (the CCR for calendar year 200X-1 is required to be released by July 1,

**200X**, for compliance with the CCR Rule). In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year **200X-1** or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year **200X**, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-25. An example of a report of this violation in the CCR is shown in Example 6-26.

**Example 6-25. Example Tier 3 Public Notification for Failure to Maintain Disinfection Profiles**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Recordkeeping Requirements Not Met for System P**

Our water system recently failed to keep records on file for the specified time period. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We created an analysis of our disinfection processes in 2000. After receiving state approval to use this analysis to satisfy new requirements, we discarded the profiling data on January 1, **200X**. The state had already reviewed the profiles in two sanitary surveys since 2000.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

On June 1, **200X** we obtained copies of our missing data from the state. This situation is now resolved.

For more information, please contact John Johnson, manager of System P, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System P.

State Water System ID# GA1234571. Sent: June 20, **200X**

**Example 6-26. Example of a Notice in the CCR for Failure to Maintain Disinfection Profiles**

**Violation**

- Our water system recently failed to keep records on file for the specified time period. We created an analysis of our disinfection processes in 2000. After receiving state approval to use this analysis to satisfy new requirements we discarded the profiling data on January 1, 200X. The state had already reviewed the profiles in two sanitary surveys since 2000.

On June 1, 200X we obtained copies of our missing data from the state. This situation is now resolved.

**Example 14: Failure to Maintain Source Water Monitoring Results and Bin Classification (initial or second round)**

**System Description - System Q**

System Q is a small Subpart H system serving 6,000 people.

**Situation**

System Q was required to conduct source water monitoring for *Cryptosporidium*. Based on that monitoring, which the system completed on June 30, 200X, it determines that it is a bin 1 system because its mean *Cryptosporidium* concentration was less than 0.075 oocysts/L. Because it does not have to provide additional treatment for *Cryptosporidium*, System Q discards its source water monitoring results and fails to replace them.

**Public Notification and Consumer Confidence Report Requirements**

System Q has committed a recordkeeping violation. All Subpart H systems are required to maintain the results of their source water monitoring and their bin classification for at least 36 months after they complete their source water monitoring. The system must provide Tier 3 public notice of the violation. The system must provide public notification within 1 year of learning of the violation. Notification must be provided by mail or other direct delivery method (such as hand delivery), and any other reasonable method to reach affected individuals that would not have received the information by mail or the direct delivery method used. Notice must be provided to each customer receiving a bill and other service connections to which water is delivered.

Since System Q is a community water system, it could use the CCR to inform the public of the Tier 3 violations if the CCR is released within 1 year of the system's learning of the violations. For this particular example, the system became aware of the violations on September 1, 200X. The public could therefore be informed of the violation in the CCR produced for calendar year 200X if the CCR is released prior to September 1, 200X+1. In this situation, additional public notification would not be required. However, whether public notification is provided by the CCR for calendar year 200X or by other means, this violation would still have to be reported by the system in the CCR produced for calendar year 200X, since all violations of National Primary Drinking Water Rules must be reported in the CCR for the

calendar year in which the system became aware of the violation. The violation report in the CCR should include similar information contained in the public notice.

An example of a public notice that fulfills the public notification requirements for this violation is shown in Example 6-27. An example of a report of this violation in the CCR is shown in Example 6-28.

**Example 6-27. Example Tier 3 Public Notification for Failure to Maintain Source Water Monitoring Results and Bin Classification (initial or second round)**

**IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER**  
**Recordkeeping Requirements Not Met for System Q**

Our water system recently failed to keep records on file for the specified time period. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We were required to conduct source water monitoring for *Cryptosporidium*. Based on that monitoring, which we completed on June 30, 200X, we do not have to provide additional treatment for *Cryptosporidium*, and we discarded the source water monitoring results in August 200X. We were, however, required to maintain the results of this source water monitoring and bin classification for at least 36 months after completing the source water monitoring.

**What should I do?**

There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

**What was done?**

Because of the nature of this violation no further action was required.

For more information, please contact John Johnson, manager of System Q, at 555-1234 or write to 2600 Winding Rd., Townsville, SA 12345.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by System Q.

State Water System ID# GA1234571. Sent: September 1, 200X [insert date 36 months]

**Example 6-28. Example of a Notice in the CCR for Failure to Maintain Source Water Monitoring Results and Bin Classification (initial or second round)**

**Violation**

- Our water system recently failed to keep records on file for the specified time period. We were required to conduct source water monitoring for *Cryptosporidium*. Based on that monitoring, which we completed on June 30, 200X, we do not have to provide additional treatment for *Cryptosporidium*, and discarded the source water monitoring results in August 200X. We were required to maintain the results of this source water monitoring and bin classification for at least 36 months after completing the source water monitoring.

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