PROPOSED RULEMAKING

ENVIRONMENTAL QUALITY BOARD

[25 PA. CODE CH. 109]

Long-Term 2 Enhanced Surface Water Treatment Rule; (Safe Drinking Water)

The Environmental Quality Board (Board) proposes to amend Chapter 109 (relating to safe drinking water). The amendments pertain to public water systems (PWSs) supplied by a surface water source and PWSs supplied by a groundwater source under the direct influence of surface water. The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2) will further protect public health against *Cryptosporidium* and other microbial pathogens in drinking water. These amendments will supplement existing microbial treatment regulations and targets PWSs with higher potential risk from *Cryptosporidium*. *Cryptosporidium* is a particular concern because it is highly resistant to chlorine and has been identified as the cause of a number of waterborne disease outbreaks in the United States. The EPA has concluded that existing treatment requirements do not provide adequate public health protection in filtered PWSs with the highest source water *Cryptosporidium* levels. Consequently, these amendments will require PWSs to monitor their source water to determine an average *Cryptosporidium* level that will be used to establish the degree of additional treatment, if any, the filtered PWS must provide. Additional *Cryptosporidium* treatment must be achieved by using one or more treatment or control processes form a microbial toolbox of options, and systems must report that these toolbox options are adequately maintained.

This proposal was adopted by the Board at its meeting of August 19, 2008.

A. *Effective Date*

These amendments will go into effect upon publication in the *Pennsylvania Bulletin* as final-form rulemaking.

B. *Contact Persons*

For further information contact Barry Greenawald, Chief, Division of Operations Monitoring and Training, P. O. Box 8467, Rachel Carson State Office Building, Harrisburg, PA 17105-8467, (717) 772-4018 or Marylou Barton, Assistant Counsel, Bureau of Regulatory Counsel, P. O. Box 8464, Rachel Carson State Office Building, Harrisburg, PA 17105-8464, (717) 787-7060. Information regarding submitting comments on this proposal appears in Section J of this preamble. Persons with a disability may use the Pennsylvania AT&T Relay Service by calling (800) 654-5984 (TDD users) or (800) 654-5988 (voice users). This proposal is available electronically through the Department of Environmental Protection (Department) web site www.depweb.state.pa.us.

C. *Statutory Authority*

The proposed rulemaking is being made under the authority of section 4 of the Pennsylvania Safe Drinking Water Act (35 P. S. § 721.4), which grants the Board the authority to adopt rules and regulations governing the provision of drinking water to the public, and sections 1917-A and 1920-A of The Administrative Code of 1929 (71 P. S. §§ 510-7 and 510-20).

D. *Background and Purpose*

These proposed amendments apply to PWSs supplied by a surface water source and public water systems supplied by a groundwater source under the direct influence of surface water (GUDI). Approximately 355 PWSs filter surface or GUDI sources to provide drinking water to about 8.4 million Commonwealth citizens and thousands of visitors. Surface and GUDI sources have been shown to contain *Cryptosporidium* and other pathogens which pose a public health risk. *Cryptosporidium* is a particular concern targeted by the LT2 because it is has been identified as the cause of a number of waterborne disease outbreaks in the United States. *Cryptosporidium* is a common protozoan in the environment. Sources of *Cryptosporidium* oocysts include agricultural runoff and wastewater discharges. If a water system's treatment processes do not efficiently remove *Cryptosporidium*, oocysts may enter finished water at levels that pose health risks. Unlike other pathogens (disease-causing organisms) such as viruses and bacteria, *Cryptosporidium* oocysts are resistant to inactivation using standard disinfection practices, such as chlorine. Therefore, the successful control of *Cryptosporidium* is dependent on physical removal processes, such as filtration, utilized by PWSs.

In humans, *Cryptosporidium* may cause a severe gastrointestinal infection, termed *Cryptosporidiosis*, which can last several weeks. *Cryptosporidiosis* usually causes 7 to 14 days of diarrhea, a low-grade fever, nausea and abdominal cramps in individuals with healthy immune systems. There is currently no therapeutic cure for *cryptosporidiosis*, but the disease is self-limiting in healthy individuals. It does, however, pose serious health and mortality risks for sensitive subpopulations including children, the elderly, pregnant women, organ transplant recipients and persons with weakened immune systems, almost 20% of the population in the United States.

The EPA has concluded that existing treatment requirements do not provide adequate public health protection in filtered PWSs with the highest source water *Cryptosporidium* levels. The LT2 rule increases public health protection from *Cryptosporidium* by establishing a method to identify and adequately treat surface and GUDI sources with elevated levels of *Cryptosporidium*. More specifically, the rule requires the following.

PWSs must monitor their source water (the influent water entering the treatment plant) to determine an average *Cryptosporidium* level. More specifically, large systems must monitor for *Cryptosporidium*, *E.coli*, and turbidity at least once per month for 24-consecutive months. Small systems may initially monitor just for *E.coli* as a screening analysis and are required to monitor for *Cryptosporidium* only if their *E. coli* levels exceed specified "trigger" values. Small PWSs that exceed the *E. coli* trigger will be required to monitor for *Cryptosporidium*.

Applicable PWSs will be classified in one of four treatment categories (or "bins") based on the results of the source water *Cryptosporidium* monitoring described in the previous paragraph. The higher the *Cryptosporidium* oocyst concentration of the source water, the higher the bin classification. This bin classification determines the degree of additional *Cryptosporidium* treatment, if any, the filtered PWS must provide above and beyond existing treatment requirements, all of which remain in effect under these amendment. The EPA

suspects that the majority of filtered PWSs will be classified in Bin 1, which carries no additional treatment requirements. PWSs classified in Bins 2, 3 or 4 must achieve 1.0-log to 2.5-log of treatment (90-99.7% reduction) for *Cryptosporidium* over and above that provided by existing conventional treatment.

Filtered PWSs must meet the additional *Cryptosporidium* treatment required in Bins 2, 3 or 4 by using treatment or control processes from a microbial toolbox of options. The microbial toolbox provides feasible treatment options specifically targeted at *Cryptosporidium* and establishes operational and design standards for each option. The toolbox options include standards for *Cryptosporidium* inactivation and removal processes, which were researched and developed by the EPA and are published for the first time in this proposed rulemaking. More specifically, standards for *Cryptospo-ridium* inactivation by ozone, chlorine dioxide and UV light are established. Standards established for processes that physically remove *Cryptosporidium* contamination include membranes, bag filters, cartridge filters, presedimentation basins and riverbank filtration. The development of these standards overcomes an existing significant limitation by providing specific strategies to comply with additional *Cryptsporidium* treatment.

The EPA believes that implementation of the LT2 will significantly reduce levels of infectious *Cryptosporidium* in finished drinking water. In addition, the treatment technique requirements of this proposed rulemaking will increase protection against other microbial contaminants by improving overall filter plant treatment. Considering that approximately 355 PWSs would be impacted by this proposed rulemaking, it is in the best interest of this Commonwealth's public health protection and economic development goals to incorporate the LT2 into Chapter 109.

The draft proposed LT2 amendments were presented to the Small Systems Technical Assistance Center Advisory Board (TAC Board) on November 13, 2007. On December 12, 2007, the TAC Board provided a letter supporting the draft proposed amendments, and included written comments. The most noteworthy comments included: upfront clarification of applicability to surface and GUDI, support of additional Department language on the EPA research, need to add definition of "bin," consistent methodology for challenge testing, value of adding Microbial Toolbox Summary and Reporting Requirements as appendices to Chapter 109, which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in Preamble) and acceptance of validation testing requirements. LT2 specific comments were thoroughly considered and the majority of them were addressed or incorporated, or both, into the proposed amendments.

E. *Summary of Regulatory Requirements*

The proposed amendments are based on Federal Long-Term 2 Enhanced Surface Water Treatment Rule requirements. The majority of the amendments directly reflect and are no more stringent than Federal regulatory language. Specific differences, including more stringent language will be outlined as follows.

Additions to existing Chapter 109 language follow:

§ 109.1 Definitions.

The Department has added definitions for the following terms in 109.1: "bag filter," "bank filtration," "bin," "cartridge filter," "flowing stream," "lake/reservoir," "membrane" "filtration," "plant intake," "presedimentation," "significant deficiency" and "2-stage lime softening." These terms are vital to the clear interpretation of the LT2 and had not been previously defined in Chapter 109.

Additionally, the following text was added to the existing definition of "conventional filtration," "The clarification step must be a solid/liquid separation process where accumulated solids are removed during this separate component of the treatment system." This text was incorporated because it provides valuable clarification to help ensure consistent Statewide implementation and application of the existing definition. This additional text is consistent with the EPA language provided in the preamble of the LT2 regulation. By means of a memo and verbal discussion, the EPA Headquarters indicated this language should be used to clarify any confusion when implementing regulations and applying the conventional classification.

§ 109.202 (relating to State MCLs, MRDLs and treatment technique requirements)

The provisions of this section alert GUDI sources that they must monitor source water for *Cryptosporidium*.

§ 109.204 (relating to disinfection profiling and benchmarking).

The provisions of this section update an existing incorporation of Federal requirements by reference.

§ 109.304 (relating to analytical requirements).

The provisions of this section alert systems that they must use an approved laboratory to analyze *Cryptosporidium* samples.

§ 109.418 (relating to special notice for failure to conduct source water Cryptosporidium *monitoring or failure to determine bin classification).*

The provisions of this section incorporate Federal language regarding required public notification for failure to adequately conduct all necessary source water monitoring.

§ 109.705 (relating to sanitary surveys).

The provisions of this section incorporate Federal language which outlines the requirements of a system for responding to and correcting significant deficiencies identified in a sanitary survey report.

§ 109.1002 (relating to MCLs, MRDLs or treatment techniques).

The provisions of this section alert bottled water and vended water systems to the treatment technique requirements (additional treatment for elevated *Cryptosporidium* source water levels) of the LT2. These would only apply in the rare circumstance where a bottled or vended system utilizes surface or GUDI as a source.

§ 109.1003 (relating to monitoring requirements).

The provisions of this section alert bottled water and vended water systems to the source water monitoring requirements of the LT2. These would only apply in the rare circumstance where a bottled or vended system utilizes surface or GUDI as a source.

New language added to Chapter 109 by means of Subchapter L. Long-Term 2 Enhanced Surface Water Treatment Rule follow:

§ 109.1201 (relating to scope).

These proposed amendments apply to PWSs supplied by a surface water source and public water systems

supplied by a groundwater source under the direct influence of surface water. Approximately 355 PWSs, serving about 8.4 million citizens will be impacted by the proposed amendments. Compliance dates will be determined following four schedules based on population served by the PWS.

Language in this section is identical to Federal language.

§ 109.1202 (relating to monitoring requirements).

These amendments require applicable PWSs to monitor their source water (the influent water entering the treatment plant) to determine an average *Cryptosporidium* level. More specifically, Schedule 1—3 systems must monitor for *Cryptosporidium*, *E.coli* and turbidity at least once per month for 24 consecutive months. Schedule 4 systems may initially monitor just for *E.coli* as a screening analysis and are required to monitor for *Cryptosporidium* only if their *E. coli* levels exceed specified "trigger" values. Schedule 4 PWSs that exceed the *E. coli* trigger must monitor for *Cryptosporidium* for either 12 consecutive months (two samples per month) or 24 consecutive months (one sample per month). Provisions are included which may allow seasonal sources to conduct less overall monitoring, a total of 12 samples evenly spaced within the season of operation. Sampling start dates are staggered with the largest systems monitoring first and the smallest last. This allows small systems more time to prepare and budget for the sampling. It also helps prevent overwhelming demand on the analytical laboratories.

Language in this section is identical to Federal language with the following exceptions, identified by italics:

Section 109.1202(a)(5) for filtered systems serving fewer than 10,000 people, the Department may approve monitoring for an indicator other than *E. coli* under subsection (a)(3). The Department also may approve an alternative to the *E. coli* concentration in subsection (a)(4)(i), (ii) or (iv) to trigger *Cryptosporidium* monitoring. The Department added the following language "*This approval by the Department would be based on EPA-supported research indicating the validity of an alternative to* E. coli."

The italicized language is necessary because the decision to approve an alternative to *E.coli* should be based on substantial National research.

§ 109.1202(f) New sources.

(1) A system that *intends* to use a new source of surface water or GUDI after the system is required to begin monitoring under subsection (c) shall monitor the new source on a schedule the Department approves. *Any source that has not been monitored according to the requirements of this subchapter will be considered to be a new source. Source water monitoring for new sources must meet the requirements of this subchapter. The system shall also meet the bin classification and* Cryptosporidium *treatment requirements of § 109.1203(a)—(j), as applicable, for the new source on a schedule approved by the Department. Sources that have not been monitored according to the requirements of this subchapter will be considered to be Bin 4 until monitoring is adequately completed. No later than the applicable* Cryptosporidium *compliance dates specified in § 109.1203(k), systems wishing to use sources that have not been monitored shall meet the Bin 4 treatment requirements of § 109.1203 (a)—(j) unless otherwise indicated by the Department.*

§ 109.1202(p) Multiple sources.

Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and groundwater sources, shall collect samples as specified in subsection (e)(1) or (2). The use of multiple sources during monitoring must be consistent with routine operational practice. *Sources not adequately evaluated during the monitoring period will be considered new sources and the requirements under § 109.1202(f) (relating to new sources) will apply. Systems may begin monitoring a new source as soon as a sampling schedule and plan has been approved by the Department.*

Additional italicized language was added to the subsections (f) and (p) to clarify the meaning of "new sources." This language was created in response to ongoing confusion from systems already conducting the sampling on their sources and comments from the TAC Board. This addition was necessary because the EPA failed to address the issue of exactly what a "new source" was, creating the potential for confusion and lack of necessary monitoring on numerous sources. More importantly, the EPA failed to address how multiple sources, not utilized during the initial round of sampling, would be dealt with. The EPA assumed systems would only utilize one source. The vast majority of this Commonwealth's filter plants have more than one source. The Department has chosen to designate any sources not evaluated during the initial round of sampling as a new source. This enables the Commonwealth to establish a reasonable schedule for the monitoring of these sources, allowing systems time to budget for and conduct the monitoring. This approach also assures public health is adequately protected and unmonitored sources are not utilized without proper treatment. Language in this section was created to fill a void in Federal language, it does not specifically alter existing Federal language in a more stringent fashion. In developing this language, the Department worked with the Association of State Drinking Water Administrators (ASDWA) to setup National conference calls with other state regulatory agencies. The Department's approach is consistent with the National consensus approach, presented to EPA Head Quarters by means of an ASDWA memo.

§ 109.1203 (relating to bin classification and treatment technique requirement).

Applicable PWSs will be classified in one of four treatment categories (or "bins") based on the results of the source water *Cryptosporidium* monitoring described in the previous section. The higher the *Cryptosporidium* oocyst concentration of the source water, the higher the bin classification. This bin classification determines the degree of additional *Cryptosporidium* treatment, if any, the filtered PWS must provide above and beyond existing treatment requirements, all of which remain in effect under this amendment. The EPA suspects that the majority of filtered PWSs will be classified in Bin 1, which carries no additional treatment requirements. PWSs classified in Bins 2, 3 or 4 must achieve 1.0-log to 2.5-log of treatment (90-99.7% reduction) for *Cryptosporidium* over and above that provided by existing conventional treatment. Ultimately, this additional treatment establishes a new treatment technique requirement for filter plants whose source water is Bin 2 or greater. As with monitoring, bin determination and compliance dates are staggered with large systems being impacted first and small systems last.

Language in this section is similar to Federal language with the following exceptions, identified by italics:

§ 109.1203(e) (relating to filtered system additional Cryptosporidium *treatment requirements).*

Filtered systems shall provide the level of additional treatment for *Cryptosporidium* specified in this subsec-

tion based on their bin classification as determined under § 109.1203 (a)—(c) and according to the schedule in § 109.1203(k)—(o). If the system bin classification is Bin 1 *and the system is in full compliance with applicable treatment technique requirements under § 109.202(c),* the system shall provide additional *Cryptosporidium* treatment requirements as follows:

The previously italicized language was added for all system types in § 109.1203(e). The Department felt it was necessary to clarify the intent of the Federal regulation to provide additional treatment beyond that already required. Incorporating a Chapter 109-specific reference to existing regulatory requirements should help prevent confusion on the part of the regulated community.

§ 109.1203(m)(5)

On a case by case basis within an agreed upon time frame, the Departments may allow up to an additional 2 years for complying with the treatment requirement for systems making capital improvements.

The previously italicized language was added based on comments from the TAC Board that this would help provide clarification and prevent confusion.

Throughout the Federal LT2 rule, specific language was incorporated to provide a compliance approach for unfiltered systems. Under existing Chapter 109 requirements, the Commonwealth does not allow unfiltered systems. However, a small number of systems have sources which were thought to be groundwater; therefore, these sources had been used in an unfiltered status. It was recently determined that some of these well sources are actually under the influence of surface water or GUDI. Unfiltered language was incorporated into the State LT2 regulation to address these sources. However, the unfiltered source testing requirements and bin determination are essentially identical to the filtered source testing requirements. This language is more stringent than Federal language; but, necessary to be consistent with existing Chapter 109 language. Most importantly, it is necessary to assure that public health and safety are adequately protected by the addition of proper filtration on unfiltered surface and GUDI sources.

§ 109.1204 (relating to requirements for microbial toolbox components).

Filtered PWSs must meet the additional *Cryptosporidium* treatment required in Bins 2, 3 or 4 by using treatment or control processes from a microbial toolbox of options. The microbial toolbox provides feasible treatment options specifically targeted at *Cryptosporidium* and establishes operational and design standards for each option. The toolbox options include standards for *Cryptosporidium* inactivation and removal processes, which were researched and developed by the EPA and are published for the first time in this proposed rulemaking. More specifically, standards for *Cryptosporidium* inactivation by ozone, chlorine dioxide and UV light are established. Standards established for processes that physically remove *Cryptosporidium* contamination include membranes, bag filters, cartridge filters, presedimentation basins and riverbank filtration. The development of these standards overcomes an existing significant limitation by providing specific strategies to comply with additional *Cryptsporidium* treatment.

Language in this section is identical to Federal language with the following exceptions, identified by italics:

§ 109.1204(b)

Watershed control program. Systems receive 0.5-log *Cryptosporidium* treatment credit for implementing a watershed control program that meets the requirements. *This credit may not be used to maintain the additional log removal credits specified in § 109.1203 (relating to bin classification and treatment technique requirements). This credit may only be applied in addition to the toolbox options used to meet the minimum log removal and may apply in lieu of a toolbox option for which credit has been temporarily revoked.*

The previously italicized text is more stringent than Federal language. It is necessary to avoid imposition of treatment technique violations upon water systems due to events which they have no control over. The watershed control program (WCP) option is different than other toolbox options in that it relates to efforts undertaken outside of the filter plant operations to reduce *Cryptosporidium* loading entering the filter plant. Additionally, this option focuses on source water protection, as opposed to in-plant treatment and monthly reporting. The Department anticipates that in a scenario where a spill or other contamination of the source water was to occur upstream of the filter plant intake, the WCP credit could be revoked. If systems rely on this credit to maintain the minimum *Cryptosporidium* log removal credit, a treatment technique violation would be incurred by the water system through no action of its own. The italicized language encourages source water protection and allows systems to pursue this valuable toolbox option, while preventing situations where systems rely on this option to maintain a monthly treatment technique; avoiding the previously mentioned scenario. The Department anticipates that systems will wish to pursue additional log removal treatment beyond the minimum required by their bin classification (Bin 2 and greater). It would be wise for systems to do this to provide a margin of safety regarding the removal of *Cryptosporidium*. The italicized language is consistent with this thinking.

§ 109.1204(o) Chlorine dioxide.

Systems are eligible to receive the *Cryptosporidium* treatment credit listed in Table 1. CT Values (mg min/L) for *Cryptosporidium* Inactivation by Chlorine Dioxide, contained in Appendix A to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in subsection (n).

(1) The Department may approve alternative chlorine dioxide CT values to those listed in subsection (o) on a site-specific basis.

(2) The Department will base this approval on a site-specific study a system conducts that follows a Department-approved protocol.

The Department chose to remove the above italicized text from the regulation. The CT values published in the Federal regulation are based on extensive research and are the minimum dosages necessary to assure proper operation of this treatment process. To assure consistent application of this technology on a level that is protective of public health and safety, the Department felt it was best to remove the text allowing site-specific deviations.

§ 109.1204(p) Ozone.

Systems receive the *Cryptosporidium* treatment credit listed in Table 2 CT Values (mg min/L) for *Cryptosporidium* Inactivation by Ozone, contained in Appendix A to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword:

Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), by meeting the corresponding ozone CT values for the applicable water temperature, as described in subsection (n).

(1) The Department may approve alternative Ozone CT values to those listed in subsection (p) on a site-specific basis.

(2) The Department will base this approval on a site-specific study a system conducts that follows a Department-approved protocol.

The Department chose to remove the above italicized text from the regulation. The CT values published in the Federal regulation are based on extensive research and are the minimum dosages necessary to assure proper operation of this treatment process. To assure consistent application of this technology on a level that is protective of public health and safety, the Department felt it was best to remove the text allowing site-specific deviations.

§ 109.1204(q)(2)(iii)

The Department may accept alternative validation testing approaches, *if these approaches are first approved by EPA*.

The Department chose to add the above italicized text to assure adequate research is conducted on a particular UV treatment unit prior to validation and approval. This is necessary to assure proper operation of this treatment process and National standards are consistently upheld. To assure consistent application of this technology on a level that is protective of public health and safety, the Department felt it was best to work closely with the EPA and other state regulators to develop alternative validation testing approaches. This should help prevent systems from incurring additional costs necessary to validate an already properly-validated treatment unit.

§ 109.1205 (relating to reporting and recordkeeping requirements).

PWSs impacted by these proposed amendments must report source water monitoring results and bin determination. PWSs which fall into Bin 2, 3 or 4 must report which toolbox options are used to meet these requirements. Additionally these systems must report monthly that the selected toolbox options are being adequately maintained within specified operating standards.

Language in this section is identical to Federal language with the following exceptions, identified by italics:

§ 109.1205(i)

(i) Microbial toolbox reporting requirements. Microbial toolbox reporting requirements, established by the EPA under the National Primary Drinking Water regulations in 40 CFR 141.721(f) are incorporated by reference except as otherwise established by this chapter. Systems are required to report items specified § 109.1204 for all toolbox components for which they are requesting treatment credit, as outlined in Appendix B to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble). *Alternatively, the State may approve a system to certify operation within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.*

The Department deleted the above italicized text because it is contradictory to other LT2 regulatory language, which outlines detailed reporting requirements; and the overall intent of the regulation, to assure increased treatment is maintained on sources with elevated *Cryptosporidium*. It is critical that systems using sources with elevated *Cryptosporidium* levels, adequately and vigilantly maintain this additional treatment. To assure adequate protection of public health and safety, monthly reporting is necessary. The EPA has established no other mechanism to assure proper operation without the reporting. Therefore, this alternative would result in state and National inconsistencies regarding treatment requirements. Systems required to conduct this reporting, would be doing so to assure compliance with a more stringent treatment technique for the removal of *Cryptosporidium*, shown to be an acute public health risk. Monthly reporting for treatment technique compliance has always been the minimum requirement for previous treatment techniques. Therefore, it is a reasonable expectation to maintain this requirement as a mechanism to assure adequate *Cryptosporidium* treatment remains in place.

F. *Benefits, Costs and Compliance*

Benefits

The LT2 rule will further protect public health against *Cryptosporidium* and other microbial pathogens in drinking water supplied to approximately 8.4 million Commonwealth citizens and thousands of out-of-State visitors. These amendments will supplement existing microbial treatment regulations and target PWSs with higher potential risk from *Cryptosporidium*. *Cryptosporidium* is a particular concern because it is highly resistant to chlorine and has been identified as the cause of a number of waterborne disease outbreaks in the United States. The EPA has concluded that existing treatment requirements do not provide adequate public health protection in filtered PWSs with the highest source water *Cryptosporidium* levels. Consequently, these amendments will require PWSs to monitor their source water to determine an average *Cryptosporidium* level that will be used to establish the degree of additional treatment, if any, the filtered PWSs must provide.

Additional Cryptosporidium treatment is expected to result in a reduced rate of *Cryptosporidium*-related illnesses and death. The EPA estimates that after full implementation of the LT2 rule, on average, the Nation is expected to avoid 89,375 to 1,459,126 illnesses and 20 to 314 deaths annually.

Furthermore, the EPA estimates the annual present value of the mean benefit of LT2 rule implementation ranges from $177 million to $2.8 billion, depending on the rate of *Cryptosporidium* occurrence.

Projecting the distribution of illnesses and deaths from *Cryptosporidium* within this Commonwealth is extremely difficult; however, the best available potential estimate would be a $4.48 million to $70.84 million annual benefit depending on the rate of *Cryptosporidium* occurrence.

Compliance Costs

The LT2 rule applies to PWSs supplied by a surface water source and PWSs supplied by a GUDI source. Approximately 355 PWSs treat surface or GUDI sources to ultimately provide drinking water to about 8.4 million Commonwealth citizens and thousands of out-of-State visitors. All 355 PWSs will be affected by this rule to varying degrees. According to the EPA, the overall mean annualized LT2 cost impacts to PWSs are estimated to range from approximately $93 to $133 million. This range in mean cost estimates is associated with the different *Cryptosporidium* occurrence data sets. In this Commonwealth, this tranlates to $2,352,900 to $3,364,900.

More specifically, PWSs will incur monitoring costs to assess source water *Cryptosporidium* levels, though monitoring requirements vary by PWS size (large v. small). Source water monitoring costs are structured on a per-plant basis. There are three types of monitoring that plants may be required to conduct turbidity, *E. coli*, and *Cryptosporidium*. Source water turbidity is a common water quality parameter used for plant operational control. Also, to meet Surface Water Treatment Rule (SWTR), Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), and Interim Enhnaced Surface Water Treatment Rule (IESWTR) requirements, most PWSs have turbidity analytical equipment in-house and operators are experienced with turbidity measurement. Thus, the EPA assumes that the incremental turbidity monitoring burden associated with the LT2 is negligible.

Estimates of laboratory fees, shipping costs, labor hours for sample collection, and hours for reporting results were used to predict PWS costs for initial source water monitoring under the LT2. National monitoring costs for initial monitoring range from $45 million to $59 million depending on the occurrence data set and discount rate. In this Commonwealth, monitoring cost estimates range from $1.14 million to $1.49 million.

Filtered plants in small PWSs initially will be required to conduct 1 year of biweekly *E. coli* source water monitoring. These plants will be required to monitor for *Cryptosporidium* if *E. coli* levels exceed 10 *E. coli*/100 mL for lakes and reservoir sources or 50 *E. coli*/100 mL for flowing stream sources. The EPA estimated the percent of small plants that would be triggered into *Cryptosporidium* monitoring as being equal to the percent of large plants that would fall into any bin requiring additional treatment. The EPA survey data indicate that approximately 75 to 80% of small PWSs will not exceed the *E. coli* trigger values and, consequently, will not be required to monitor for *Cryptosporidium*. *E. coli* ($25/sample) is far less costly to analyze than *Cryptosporidium* $500/sample; therefore, this approach will significantly reduce the burden for small PWSs. In this Commonwealth, 260 small systems (serve < 10,000 customers) are afffected by LT2. If the EPA estimates are true, 195 small systems will avoid *Cryptosporidium* sampling costs, needing to spend $650 per system to sample. This equates to a total cost savings 12,000 per small system or $2.46 million total. Conversley 65 small systems may be required to incur the full sampling cost of $12,650 per system.

All PWSs that conducted initial monitoring were assumed to conduct the second round of monitoring, except for those PWSs that installed treatment that achieves a total of 5.5-log or greater treatment for *Cryptosporidium* as a result of the rule. The PWSs are exempt from monitoring under the LT2. The EPA estimates that the cost of the second round of source water monitoring will range from $21 million to $36 million, depending on the occurrence data set and discount rate used in the estimate. In this Commonwealth, this translates to approximately $531,130 to $910,800 cost for the second round of monitoring.

Some PWSs (10% estimate) will incur costs for additional *Cryptosporidium* treatment, where required. The EPA was unable to provide specific cost estimates for additional treatment, due to the variety of options available. In this Commonwealth, it is estimated that 35 systems may need to provide additional treatment. It is expected that most of these systems will take advantage of the option of optimizing filter plant turbidity to 0.15 NTU (50% lower than current regulatory requirements). Due to ongoing optimization assistance efforts, this Commonwealth's filter plants are well positioned to meet these lower requirements. Optimizing filter plant turbidities is an operational technique, much less costly than installation of additional treatment.

The EPA estimates that states (including primacy agencies) will incur an annualized cost of $1.1 to 1.4 million. In this Commonwealth, this translates to $27,830 to $35,420.

The EPA estimates that all households served by surface and GUDI sources will face some increase in household costs due to implementation of the LT2. Over 95% of all households are estimated to face an annual cost increase of less than $12. Households served by small PWSs that install advanced technologies will face the greatest increases in annual costs. Approximately 8.4 million Commonwealth citizens and thousands of visitors receive drinking water from filter plants affected by LT2.

Compliance Assistance Plan

The Department's Safe Drinking Water Program utilizes the Commonwealth's PENNVEST Program to offer financial assistance to eligible public water systems. This assistance is in the form of a low-interest loan, with some augmenting grant funds for hardship cases. Eligibility is based upon factors such as public health impact, compliance necessity and project/operational affordability.

In addition, the Department has instituted a number of assistance programs, including the highly successful and Nationally recognized Filter Plant Performance Evaluation Program. More recently, the Department contracted with the Pennsylvania Section American Water Works Association under the Partnership for Safe Water Program. The Partnership promotes and supports filtered surface water suppliers who are committed to going beyond compliance. The Department is a leading participant in the EPA Area Wide Optimization Program. This National program provides compliance assistance tools, which state regulatory agencies can share with water suppliers. The Department has been utilizing a data collection and analysis tool—Optimization Assessment Software (OAS)—for approximately 3 years. Utilizing the OAS software will help systems prepare to take advantage of the optimized turbidity toolbox options of the LT2 regulation.

Finally, the Bureau of Water Standards and Facility Regulation has a section dedicated to providing both training and outreach support services to public water system operators. As a result of the Department's efforts outlined previously, this Commonwealth's public water suppliers are well positioned to manage the risk and meet the more rigorous public health protection measures included in the LT2.

Paperwork Requirements

The proposed amendments will require monitoring and reporting of source water *Cryptosporidium* levels. A small number of water systems, those with elevated source water *Cryptosporidium*, will need to report monthly that they are maintaining additional treatment. Modifying the existing data reporting forms, possibly creating a new form, should easily facilitate this additional monitoring and reporting. In effect, little additional paperwork will be necessary.

G. *Sunset Review*

These regulations will be reviewed in accordance with the sunset review schedule published by the Department

to determine whether the regulations effectively fulfill the goal for which it was intended.

H. *Regulatory Review*

Under section 5(a) of the Regulatory Review Act (act) (71 P. S. § 745.5(a)), on November 24, 2008, the Department submitted a copy of these proposed amendments to the Independent Regulatory Review Commission (IRRC) and the Chairpersons of the House and Senate Environmental Resources and Energy Committees (Committees). In addition to submitting the proposed amendments, the Department has provided IRRC and the Committees with a copy of a detailed Regulatory Analysis Form prepared by the Department. A copy of this material is available to the public upon request.

Under section 5(g) of the act, IRRC may convey any comments, recommendations or objections to the proposed amendments within 30 days of the close of the public comment period. The comments, recommendations or objections shall specify the regulatory review criteria that have not been met. The act specifies detailed procedures for review of these issues by the Department, the General Assembly and the Governor prior to final publication of the regulations.

I. *Public Comments*

Written Comments—Interested persons are invited to submit comments, suggestions or objections regarding the proposed rulemaking to the Environmental Quality Board, P. O. Box 8477, Harrisburg, PA 17105-8477 (express mail: Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17101-2301). Comments submitted by facsimile will not be accepted. Comments, suggestions or objections must be received by the Board by January 20, 2009. Interested persons may also submit a summary of their comments to the Board. The summary may not exceed one page in length and must also be received by the Board by January 20, 2009. The one-page summary will be provided to each member of the Board in the agenda packet distributed prior to the meeting at which the final-form rulemaking will be considered.

Electronic Comments—Comments may be submitted electronically to the Board at RegComments@state.pa.us and must also be received by the Board by January 20, 2009. A subject heading of the proposal and a return name and address must be included in each transmission.

JOHN HANGER,
Acting Chairperson

Fiscal Note: 7-426. No fiscal impact; (8) recommends adoption.

Annex A

TITLE 25. ENVIRONMENTAL PROTECTION

PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION

Subpart C. PROTECTION OF NATURAL RESOURCES

ARTICLE II. WATER RESOURCES

CHAPTER 109. SAFE DRINKING WATER

Subchapter A. GENERAL PROVISIONS

§ 109.1. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

* * * * *

***Bag filter*—A pressure-driven separation device that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. It is typically constructed of a nonrigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.**

***Bank filtration*—A water treatment process that uses a well to recover surface water that has naturally infiltrated into groundwater through a riverbed or bank). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well.**

***Bin*—A category based on the level of *Cryptosporidium* present in source water. Four potential bins exist, 1 through 4. The higher the bin, the higher the concentration of source water *Cryptosporidium*.**

* * * * *

***Cartridge filter*—A pressure-driven separation device that removes particulate matter larger than 1 micrometer using an engineered porous filtration media. It is typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.**

* * * * *

***Conventional filtration*—**The series of processes for the purpose of substantial particulate removal consisting of coagulation/flocculation, **[sedimentation] clarification, granular media** and filtration. **The clarification step must be a solid/liquid separation process where accumulated solids are removed during this separate component of the treatment system.**

* * * * *

***Flowing stream*—A course of running water flowing in a definite channel.**

* * * * *

***Lake/reservoir*—A natural or man made basin or hollow on the earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.**

* * * * *

***Membrane filtration*—**

(i) A pressure or vacuum driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test.

(ii) The term includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration and reverse osmosis.

* * * * *

***Plant intake*—The works or structures at the head of a conduit through which water is diverted from a source (for example, a river or lake) into the treatment plant.**

* * * * *

***Presedimentation*—A preliminary treatment process used to remove gravel, sand and other particu-**

late material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

* * * * *

***Significant deficiency*—A defect in design, operation or maintenance, or a failure or malfunction of the sources, treatment, storage or distribution system that the Department determines to be causing, or has the potential for causing the introduction of contamination into the water delivered to consumers.**

* * * * *

***2-stage lime softening*—A process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.**

* * * * *

Subchapter B. MCLs, MRDLs OR TREATMENT TECHNIQUE REQUIREMENTS

§ 109.202. State MCLs, MRDLs and treatment technique requirements.

* * * * *

(c) *Treatment technique requirements for pathogenic bacteria, viruses and protozoan cysts.* A public water system shall provide adequate treatment to reliably protect users from the adverse health effects of microbiological contaminants, including pathogenic bacteria, viruses and protozoan cysts. The number and type of treatment barriers and the efficacy of treatment provided shall be commensurate with the type, degree and likelihood of contamination in the source water.

(1) A public water supplier shall provide, as a minimum, continuous filtration and disinfection for surface water and GUDI sources. The treatment technique **[shall] must** provide at least 99.9% removal and inactivation of *Giardia lamblia* cysts, and at least 99.99% removal and inactivation of enteric viruses. Beginning January 1, 2002, public water suppliers serving 10,000 or more people shall provide at least 99% removal of *Cryptosporidium* oocysts. Beginning January 1, 2005, public water suppliers serving fewer than 10,000 people shall provide at least 99% removal of *Cryptosporidium* oocysts. The Department, depending on source water quality conditions, may require additional treatment as necessary to meet the requirements of this chapter and to protect the public health.

* * * * *

(vi) For a source including springs, infiltration galleries, cribs or wells permitted for use by the Department prior to May 16, 1992, and determined by the Department to be a GUDI source, the public water supplier shall:

* * * * *

(D) Monitor source water for *Cryptosporidium* as specified in § 109.1202(f) (relating to monitoring requirements).

* * * * *

§ 109.204. Disinfection profiling and benchmarking.

(a) The disinfection profiling and benchmarking requirements, established by the EPA under the National Primary Drinking Water Regulations in 40 CFR 141.172, 141.530—141.536, 141.540—141.544**, 141.570(c)** and **(d) and 141.708—141.709** are incorporated by reference except as otherwise established by this chapter.

* * * * *

Subchapter C. MONITORING REQUIREMENTS

§ 109.304. Analytical requirements.

* * * * *

(d) ***Cryptosporidium*. A system shall have *Cryptosporidium* samples analyzed by a laboratory that is approved under the EPA's Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water or a laboratory that has been accredited for *Cryptosporidium* analysis by an equivalent Department laboratory accreditation program.**

Subchapter D. PUBLIC NOTIFICATION

§ 109.418. Special notice for failure to conduct source water *Cryptosporidium* monitoring or failure to determine bin classification.

(a) *Special notice for repeated failure to conduct monitoring of the source water for Cryptosporidium and for failure to determine bin classification or Cryptosporidium level.* The owner or operator of a community or noncommunity water system that is required to monitor source water under § 109.1202 (relating to monitoring requirements) shall notify persons served by the water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect any 3 months of monitoring as specified in § 109.1202(c). The notice shall be repeated as specified in § 109.409(b)(3) (relating to Tier 2 public notice—form, manner and frequency of notice).

(b) *Delivery of the special notice for failure to determine bin classification or* Cryptosporidium *level.* The owner or operator of a community or noncommunity water system that is required to determine a bin classification under § 109.1203 (relating to bin classification and treatment technique requirements), or to determine *Cryptosporidium* level under § 109.1203(i) and (j), shall notify persons served by the water system that the determination has not been made as required no later than 30 days after the system has failed to report the determination as specified in § 109.1205(h) (relating to reporting and recordkeeping requirements) or § 109.1203(i) and (j), initial round and second round, respectively. The notice shall be repeated as specified in § 109.409(b)(3). The notice is not required if the system is complying with a Department-approved schedule to address the violation.

(c) *Form and manner of the special notice.*

(1) The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in § 109.409(c). The public notice shall be presented as required in § 109.411(c) (relating to content of a public notice).

(2) The notice must contain the following language, including the language necessary to fill in the blanks.

(i) The special notice for repeated failure to conduct monitoring must contain the following language:

We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We "did not monitor or test" or "did not complete all monitoring or testing" on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

(ii) The special notice for failure to determine bin classification or *Cryptosporidium* level must contain the following language:

We are required to monitor the source of your drinking water for *Cryptosporidium* to determine by (date) whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

(3) Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

Subchapter G. SYSTEM MANAGEMENT RESPONSIBILITIES

§ 109.705. Sanitary surveys.

* * * * *

(d) The following apply to significant deficiencies identified at public water systems supplied by a surface water source and public water systems supplied by a groundwater source under the direct influence of surface water:

(1) For sanitary surveys performed by the Department, a system shall respond in writing to significant deficiencies identified in sanitary survey reports no later than 45 days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.

(2) A system shall correct significant deficiencies identified in sanitary survey reports according to the schedule approved by the Department, or if there is no approved schedule, according to the schedule reported under paragraph (1) if the deficiencies are within the control of the system.

Subchapter J. BOTTLED WATER AND VENDED WATER SYSTEMS, RETAIL WATER FACILITIES AND BULK WATER HAULING SYSTEMS

§ 109.1002. MCLs, MRDLs or treatment techniques.

(a) Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall supply drinking water that complies with the MCLs, MRDLs and treatment technique requirements under §§ 109.202 **[and],** 109.203 **and 109.1203** (relating to State MCL's, MRDL's and treatment technique requirements; **[and]** unregulated contaminants; **and bin classification and treatment technique requirements)**.

§ 109.1003. Monitoring requirements.

(a) *General monitoring requirements.* Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall monitor for compliance with the MCLs and MRDLs in accordance with § 109.301 (relating to general monitoring requirements) and **[shall]** comply with § 109.302 (relating to special monitoring requirements) **and § 109.1202 (relating to monitoring requirements)**. The monitoring requirements shall be applied as follows, except that systems which have installed treatment to comply with primary MCL shall conduct quarterly operational monitoring for the contaminant which the facility is designed to remove:

(1) Bottled water systems, retail water facilities and bulk water hauling systems, for each entry point shall:

* * * * *

(viii) ***TTHM and HAA5 Stage 1 DBP Rule.*** Beginning January 1, 2004, monitor annually for TTHMs and HAA5 if the system uses a chemical disinfectant or oxidant, or obtains finished water from another public water system that uses a chemical disinfectant or oxidant to treat the **[finished]** water. Bottled water systems are not required to monitor for TTHMs and HAA5 if the system does not use a chlorine-based disinfectant or oxidant and does not obtain finished water from another public water system that uses a chlorine-based disinfectant or oxidant to treat the **[finished]** water.

(A) *Routine monitoring.* * * *

(B) *Reduced monitoring.* * * *

(I) Systems that use groundwater sources shall reduce monitoring to **[1] one** sample per 3-year cycle per entry point if the annual TTHM average is no greater **than** 0.040 mg/L and the annual HAA5 average is no greater than 0.030 mg/L for 2 consecutive years or the annual TTHM average is no greater than 0.020 mg/L and the annual HAA5 average is no greater than 0.015 mg/L for 1 year. The sample shall be taken during the month of warmest water temperature. The 3-year cycle shall begin on January 1 following the quarter in which the system qualifies for reduced monitoring.

(II) Systems that use groundwater sources that qualify for reduced monitoring shall remain on reduced monitoring if the TTHM **annual** average is no greater than 0.060 mg/L and the HAA5 **annual** average is no greater than 0.045 mg/L. Systems that exceed these levels shall resume routine monitoring as prescribed in clause (A), except that systems that exceed either a TTHM or HAA5 MCL shall increase monitoring to at least **[1] one** sample per quarter per entry point beginning in the quarter immediately following the quarter in which the system exceeds the TTHM or HAA5 MCL.

(ix) ***TTHM and HAA5 Stage 2 DBP Rule.*** **Beginning October 1, 2013, monitor annually for TTHMs and HAA5 if the system uses a chemical disinfectant or oxidant to treat the water, or obtains finished water from another public water system that uses a chemical disinfectant or oxidant to treat the water as follows:**

(A) ***Routine monitoring.*** **Systems shall take at least one dual sample set per year per entry point during the month of warmest water temperature.**

(B) ***Increased monitoring.*** **If any sample results exceed either a TTHM or HAA5 MCL, the system shall take at least one dual sample set per quarter per entry point. The system shall return to the sampling frequency of one dual sample set per year per entry point if, after at least 1 year of monitoring, each TTHM sample result is no greater than 0.060 mg/L and each HAA5 sample result is no greater than 0.045 mg/L.**

(x) Beginning January 1, 2004, monitor daily for chlorite if the system uses chlorine dioxide for disinfection or oxidation. Systems shall take at least one daily sample at the entry point. If a daily sample exceeds the chlorite MCL, the system shall take three additional samples within 24 hours from the same lot, batch, machine, carrier vehicle or point of delivery. The chlorite MCL is based on the average of the required daily sample plus any additional samples.

[(x)] (xi) Beginning January 1, 2004, monitor monthly for bromate if the system uses ozone for disinfection or oxidation.

(A) *Routine monitoring.* * * *

(B) *Reduced monitoring.*

(I) [Systems] Until March 31, 2009, systems shall reduce monitoring for bromate from monthly to quarterly if the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for 1 year. Systems on reduced monitoring shall continue monthly source water bromide monitoring. If the running annual average source water bromide concentration, computed quarterly, is equal to or exceeds 0.05 mg/L, the system shall revert to routine monitoring as prescribed by clause (A).

(II) Beginning April 1, 2009, a system required to analyze for bromate may reduce monitoring from monthly to quarterly, if each sample result is less than or equal to 0.0025 mg/L based on monthly measurements as prescribed in clause (A) for the most recent 12 months. Systems qualifying for reduced bromate monitoring under subclause (I) may remain on reduced monitoring as long as each sample result from the previous 12 months is less than or equal to 0.0025 mg/L. If any sample result exceeds 0.0025 mg/L, the system shall resume routine monitoring as prescribed under clause (A).

* * * * *

(*Editor Note*: The following subchapter is new. It appears in regular text to enhance readability.)

Subchapter L. LONG-TERM 2 ENHANCED SURFACE WATER TREATMENT RULE

Sec.

§ 109.1201. Scope.

(a) *Scope.* This subchapter establishes or extends treatment technique requirements in lieu of maximum contaminant levels for *Cryptosporidium*. These requirements are in addition to requirements for filtration and disinfection.

(b) *Applicability.* This subchapter applies to public water systems supplied by a surface water source and public water systems supplied by a groundwater source under the direct influence of surface water.

(1) Wholesale systems shall comply with the requirements of this subchapter based on the population of the largest system in the combined distribution system.

(2) The requirements of this subchapter for filtered systems apply to systems required by National Primary Drinking Water Regulations to provide filtration treatment, whether or not the system is currently operating a filtration system.

§ 109.1202. Monitoring requirements.

(a) *Initial round of source water monitoring.* A system shall conduct the following monitoring on the schedule in subsection (c) unless it meets the monitoring exemption criteria in subsection (d):

(1) Filtered systems serving at least 10,000 people shall sample their source water for *Cryptosporidium*, *E. coli* and turbidity at least monthly for 24 months.

(2) Unfiltered systems serving at least 10,000 people shall sample their source water for *Cryptosporidium* at least monthly for 24 months.

(3) Filtered systems serving less than 10,000 people shall sample its source water for *E. coli* at least once every 2 weeks for 12 months. A filtered system serving less than 10,000 people may avoid *E. coli* monitoring if the system notifies the Department that it will monitor for *Cryptosporidium* as described in paragraph (4). The system shall notify the Department no later than 3 months prior to the date the system is otherwise required to start *E. coli* monitoring under subsection (c).

(4) Filtered systems serving less than 10,000 people shall sample their source water for *Cryptosporidium* at least twice per month for 12 months or at least monthly for 24 months if they meet one of the following subparagraphs, based on monitoring conducted under paragraph (3):

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

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

(iii) The system does not conduct *E. coli* monitoring as described in paragraph (3).

(iv) Systems using groundwater sources under the direct influence of surface water (GUDI) shall comply with this paragraph based on the *E. coli* level that applies to the nearest surface water body. If no surface water body is nearby, the system shall comply based on the requirements that apply to systems using lake/reservoir sources.

(5) For filtered systems serving less than 10,000 people, the Department may approve monitoring for an indicator other than *E. coli* under paragraph (3). The Department also may approve an alternative to the *E. coli* concentration in paragraph (4)(i), (ii) or (iv) to trigger *Cryptosporidium* monitoring. This approval by the

Department would be based on EPA-supported research indicating the validity of an alternative to *E. coli*. The Department will provide this approval to the system in writing and will include the basis for the Department's determination that the alternative indicator, trigger level, or both, will provide a more accurate identification of whether a system will exceed the Bin 1 *Cryptosporidium* level in § 109.1203(c) (relating to bin classification and treatment technique requirements).

(6) Unfiltered systems serving less than 10,000 people shall sample their source water for *Cryptosporidium* at least twice per month for 12 months or at least monthly for 24 months.

(7) Systems may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.

(b) *Second round of source water monitoring.* Systems shall conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in subsection (a), unless they meet the monitoring exemption criteria in subsection (d). Systems shall conduct this monitoring on the schedule in subsection (c).

(c) *Source water monitoring schedule.* Systems shall begin the monitoring required in subsections (a) and (b) as follows:

(1) At least 100,000 people:

(i) Begin the first round of source water monitoring no later than the month beginning October 1, 2006.

(ii) Begin the second round of source water monitoring no later than the month beginning April 1, 2015.

(2) From 50,000 to 99,999 people:

(i) Begin the first round of source water monitoring no later than the month beginning April 1, 2007.

(ii) Begin the second round of source water monitoring no later than the month beginning October 1, 2015.

(3) From 10,000 to 49,999 people:

(i) Begin the first round of source water monitoring no later than the month beginning April 1, 2008.

(ii) Begin the second round of source water monitoring no later than the month beginning October 1, 2016.

(4) Less than 10,000 people and monitor for *E coli*:

(i) Begin the first round of source water monitoring no later than the month beginning October 1, 2008.

(ii) Begin the second round of source water monitoring no later than the month beginning October 1, 2017.

(5) Less than 10,000 and monitor for *Cryptosporidium*:

(i) Begin the first round of source water monitoring no later than the month beginning April 1, 2010.

(ii) Begin the second round of source water monitoring no later than the month beginning April 1, 2019.

(d) *Source water monitoring avoidance.*

(1) *5.5 log treatment.* A filtered system is not required to conduct source water monitoring under this subchapter if the system will provide a total of at least 5.5-log of treatment for *Cryptosporidium*, equivalent to meeting the treatment requirements of Bin 4 in § 109.1203.

(2) *Notification.* If a system chooses to provide the level of treatment in paragraph (1), as applicable, rather than start source water monitoring, the system shall notify the Department in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring under subsections (i)—(k). Alternatively, a system may choose to stop sampling at any point after it has initiated monitoring if it notifies the Department in writing that it will provide this level of treatment. Systems shall install and operate technologies to provide this level of treatment by the applicable treatment compliance date in § 109.1203(k)—(o).

(e) *Plants operating only part of the year.* Public water systems supplied by a surface water source and public water systems supplied by a groundwater source under the direct influence of surface water that operate for only part of the year shall conduct source water monitoring in accordance with this subchapter, but with the following modifications:

(1) Systems shall sample their source water only during the months that the plant operates unless the Department specifies another monitoring period based on plant operating practices.

(2) Systems with plants that operate less than 6 months per year and that monitor for *Cryptosporidium* shall collect at least six *Cryptosporidium* samples per year during each of 2 years of monitoring. Samples must be evenly spaced throughout the period the plant operates or is anticipated to operate.

(f) *New sources.*

(1) A system that intends to use a new source of surface water or GUDI after the system is required to begin monitoring under subsection (c) shall monitor the new source on a schedule the Department approves. Any source that has not been monitored according to the requirements of this subchapter will be considered to be a new source. Source water monitoring for new sources must meet the requirements of this subchapter. The system shall also meet the bin classification and *Cryptosporidium* treatment requirements of § 109.1203(a)—(j), as applicable, for the new source on a schedule approved by the Department. Sources that have not been monitored according to the requirements of this subchapter will be considered to be Bin 4 until monitoring is adequately completed. No later than the applicable *Cryptosporidium* compliance dates specified in § 109.1203(k), systems wishing to use sources that have not been monitored shall meet the Bin 4 treatment requirements of § 109.1203(a)—(j) unless otherwise indicated by the Department.

(2) The requirements of this subsection apply to public water systems supplied by a surface water source or groundwater source under the direct influence of surface water that begin operation after the monitoring start date applicable to the system's size under subsection (c).

(3) The system shall begin a second round of source water monitoring no later than 6 years following initial bin classification under § 109.1203 or determination of the *Cryptosporidium* level under § 109.1203(i) and (j), as applicable.

(g) *Monitoring violations.* Failure to collect any source water sample required under this section in accordance with the sampling schedule, sampling location, analytical method, approved laboratory and reporting requirements of this subsection, §§ 109.304 and 109.1205(a)—(e) (relating to analytical requirements; and reporting and recordkeeping requirements) is a monitoring violation.

(h) *Grandfathering monitoring data.* Systems may use (grandfather) monitoring data collected prior to the applicable monitoring start date in subsection (c) to meet the

initial source water monitoring requirements in subsection (a). Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. Data submitted under this subsection must meet the requirements in § 109.1205(f).

(i) *Source water sampling schedules.* Systems required to conduct source water monitoring under subsections (a)—(h) shall submit a sampling schedule that specifies the calendar dates when the system will collect each required sample.

(1) Systems shall submit sampling schedules no later than 3 months prior to the applicable date listed in subsection (c) for each round of required monitoring.

(2) A system must comply with the following:

(i) A system serving at least 10,000 people shall submit its sampling schedule for the initial round of source water monitoring under subsection (a) to the EPA electronically at https://intranet.epa.gov/lt2/.

(ii) If a system is unable to submit the sampling schedule electronically, the system may use an alternative approach for submitting the sampling schedule that the EPA approves.

(3) A system serving less than 10,000 people shall submit its sampling schedules for the initial round of source water monitoring under subsection (a) to the Department.

(4) Systems shall submit sampling schedules for the second round of source water monitoring under subsection (b) to the Department.

(5) If the EPA or the Department does not respond to a system regarding its sampling schedule, the system shall sample at the reported schedule.

(j) *Source water sample collection period.* Systems shall collect samples within 2 days before or 2 days after the dates indicated in their sampling schedule (that is, within a 5 day period around the schedule date) unless one of the conditions of paragraph (b)(1) or (2) applies.

(1) *Extreme sample collection conditions.* If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample in the scheduled 5-day period, the system shall sample as close to the scheduled date as is feasible unless the Department approves an alternative sampling date. The system shall submit an explanation for the delayed sampling date to the Department concurrent with the shipment of the sample to the laboratory.

(2) *Replacement samples.* The requirements for replacement samples are as follows:

(i) If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements in § 109.304, or the failure of an approved laboratory to analyze the sample, then the system shall collect a replacement sample.

(ii) The system shall collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the system demonstrates that collecting a replacement sample within this time frame is not feasible or the Department approves an alternative resampling date. The system shall submit an explanation for the delayed sampling date to the Department concurrent with the shipment of the sample to the laboratory.

(k) *Missed samples.* Systems that fail to meet the criteria of subsection (j) for any source water sample required under subsections (a)—(h) shall revise their sampling schedules to add dates for collecting all missed samples. Systems shall submit the revised schedule to the Department for approval prior to when the system begins collecting the missed samples.

(l) *Source water sampling locations.* Systems required to conduct source water monitoring under subsections (a)—(h) shall collect samples for each plant that treats a surface water or GUDI source. When multiple plants draw water from the same influent, such as the same pipe or intake, the Department may approve one set of monitoring results to be used to satisfy the requirements of subsections (a)—(h) for all plants.

(m) *Chemical treatment prior to sampling location.* Systems shall collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants.

(n) *Source water sample location for plants that recycle.* Systems that recycle filter backwash water shall collect source water samples prior to the point of filter backwash water addition.

(o) *Bank filtration.*

(1) Systems that receive *Cryptosporidium* treatment credit for bank filtration to meet existing treatment technique requirements of § 109.202(c) (relating to State MCLs, MRDLs and treatment technique requirements), as applicable, shall collect source water samples in the surface water prior to bank filtration.

(2) Systems that use bank filtration as pretreatment to a filtration plant shall collect source water samples from the well (that is, after bank filtration). Use of bank filtration during monitoring must be consistent with routine operational practice. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under § 109.1204(f) (relating to requirements for microbial toolbox components).

(p) *Multiple sources.* Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and groundwater sources, shall collect samples as specified in paragraph (1) or (2). The use of multiple sources during monitoring must be consistent with routine operational practice. Sources not adequately evaluated during the monitoring period will be considered new sources and the requirements under subsection (f) will apply. Systems may begin monitoring a new source as soon as a sampling schedule and plan have been approved by the Department.

(1) If a sampling tap is available where the sources are combined prior to treatment, systems shall collect samples from the tap.

(2) If a sampling tap where the sources are combined prior to treatment is not available, systems shall collect samples at each source near the intake on the same day and shall follow either subparagraph (i) or (ii) for sample analysis.

(i) Systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

(ii) Systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average

must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

(q) *Additional requirements*. A system shall submit a description of its sampling locations to the Department at the same time as the sampling schedule required under subsections (i)—(k). This description must address the position of the sampling location in relation to the system's water sources and treatment processes, including pretreatment, points of chemical treatment and filter backwash recycle. If the Department does not respond to a system regarding sampling locations, the system shall sample at the reported locations.

§ 109.1203. Bin classification and treatment technique requirements.

(a) *Bin classification*. Following completion of the initial round of source water monitoring required under § 109.1202(a) (relating to monitoring requirements), filtered systems shall calculate an initial *Cryptosporidium* bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the *Cryptosporidium* results reported under § 109.1202(a) and must follow the procedures in subsection (b)(1)—(5).

(b) *Procedures for calculating bin classifications.*

(1) For systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

(2) For systems that collect a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.

(3) For systems that serve less than 10,000 people and monitor for *Cryptosporidium* for only 1 year (that is, collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

(4) For systems with plants operating only part of the year that monitor less than 12 months per year under § 109.1202(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

(5) If the monthly *Cryptosporidium* sampling frequency varies, systems shall first calculate a monthly average for each month of monitoring. Systems shall then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in paragraphs (1)—(4).

(c) Cryptosporidium *bin concentration thresholds*. Systems required to monitor for *Cryptosporidium* under § 109.1202 shall use *Cryptosporidium* bin concentration calculated under subsections (a)—(b) to determine their initial bin classification as follows:

(1) With a *Cryptosporidium* bin concentration of less than 0.075 oocysts/L, the bin classification is Bin 1.

(2) With a *Cryptosporidium* bin concentration of 0.075 oocysts/L or higher, but less than 1.0 oocysts/L, the bin classification is Bin 2

(3) With a *Cryptosporidium* bin concentration of 1.0 oocysts/L or higher but less than 3.0 oocysts/L, the bin classification is Bin 3

(4) With a *Cryptosporidium* bin concentration of 3.0 oocysts/L or higher, the bin classification is Bin 4

(5) If serving less than 10,000 people and not required to monitor for *Cryptosporidium* under § 109.1202(a)(4), the bin classification is Bin 1.

(d) Cryptosporidium *bin concentration recalculation requirements*. Following completion of the second round of source water monitoring required under § 109.1202(b), filtered systems shall recalculate their *Cryptosporidium* bin concentration using the *Cryptosporidium* results reported under § 109.1202(b) and following the procedures in subsection (b)(1)—(4). Systems shall then redetermine their bin classification using the bin concentrations subsection (c).

(e) *Filtered system additional* Cryptosporidium *treatment requirements*. Filtered systems shall provide the level of additional treatment for *Cryptosporidium* specified in this subsection based on their bin classification as determined under subsections (a)—(c) and according to the schedule in subsections (k)—(o). The treatments required under paragraphs (1)—(4) are in addition to existing treatment technique requirements contained in § 109.202(c), which still apply. Systems using multiple sources shall establish their bin classification based on the highest bin source in use by the facility.

(1) *Bin 1*. If the system bin classification is Bin 1 and the system is in full compliance with applicable treatment technique requirements under § 109.202(c), the system shall provide additional *Cryptosporidium* treatment as follows:

(i) Conventional filtration treatment (including softening), slow sand or diatomaceous earth filtration must provide no additional treatment.

(ii) Direct filtration treatment must provide no additional treatment.

(iii) Alternative filtration technologies must provide no additional treatment.

(2) *Bin 2*. If the system bin classification is Bin 2 and the system is in full compliance with applicable treatment technique requirements under § 109.202(c) (relating to State MDLs, MDRLs and technique requirements), the system shall provide additional *Cryptosporidium* treatment as follows:

(i) Conventional filtration treatment (including softening), slow sand or diatomaceous earth filtration must provide 1-log additional treatment.

(ii) Direct filtration treatment must provide 1.5 log additional treatment.

(iii) Alternative filtration technologies must provide additional treatment as determined by the Department such that the total *Cryptosporidium* removal and inactivation is at least 4.0 log.

(3) *Bin 3*. If the system bin classification is Bin 3 and the system is in full compliance with applicable treatment technique requirements under § 109.202(c), the system shall provide additional *Cryptosporidium* treatment as follows:

(i) Conventional filtration treatment (including softening), slow sand or diatomaceous earth filtration must provide 2-log additional treatment.

(ii) Direct filtration treatment must provide 2.5 log additional treatment.

(iii) Alternative filtration technologies must provide additional treatment as determined by the Department so that the total *Cryptosporidium* removal and inactivation is at least 5.0 log.

(4) *Bin 4.* If the system bin classification is Bin 4 and the system is in full compliance with applicable treatment technique requirements under § 109.202(c), the system shall provide additional *Cryptosporidium* treatment as follows:

(i) Conventional filtration treatment (including softening), slow sand or diatomaceous earth filtration must provide 2.5-log additional treatment.

(ii) Direct filtration treatment must provide 3 log additional treatment.

(iii) Alternative filtration technologies must provide additional treatment as determined by the Department so that the total *Cryptosporidium* removal and inactivation is at least 5.5 log.

(f) *Treatment and management options for filtered systems, microbial toolbox.*

(1) Filtered systems shall use one or more of the treatment and management options listed in § 109.1204 (relating to requirements for microbial toolbox components), termed the microbial toolbox, to comply with the additional *Cryptosporidium* treatment required in subsection (e).

(2) Systems using sources classified in Bin 3 and Bin 4 shall achieve at least 1-log of the additional *Cryptosporidium* treatment required under § 109.1204(a) using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone or UV, as described in § 109.1204(b), (c) and (n)—(q) (relating to requirements for microbial toolbox components).

(g) *Failure to meet treatment credit.* Failure by a system in any month to achieve treatment credit by meeting criteria in § 109.1204(b), (c) and (n)—(q) for microbial toolbox options that is at least equal to the level of treatment required in subsection (e) is a violation of the treatment technique requirement.

(h) *Increased watershed contamination.* If the Department determines during a sanitary survey or an equivalent source water assessment that after a system completed the monitoring conducted under § 109.1202(a) or (b), significant changes occurred in the system's watershed that could lead to increased contamination of the source water by *Cryptosporidium*, the system shall take actions specified by the Department to address the contamination. These actions may include additional source water monitoring or implementing microbial toolbox options listed in § 109.1204, or both.

(i) *Unfiltered systems determination of* Cryptosporidium *bin level, initial round.* Following completion of the initial source water monitoring required under § 109.1202(a), unfiltered systems shall calculate their bin classification using the methods listed in subsections (b) and (c).

(j) *Unfiltered systems determination of Cryptosporidium bin level, second round.* Following completion of the second round of source water monitoring required under subsection (b), unfiltered systems shall calculate their bin classification using the methods listed in subsections (b) and (c).

(k) *Schedule for compliance with* Cryptosporidium *treatment requirements.* Following initial bin classification under subsection (c), filtered systems shall provide the level of additional treatment for *Cryptosporidium* required under subsections (e)—(h) according to the schedule in subsection (m). The treatments required under subsections (e)—(h) are in addition to existing treatment technique requirements contained in § 109.202(c), which still apply.

(l) *Treatment technique requirements for unfiltered systems.* Following initial determination of the *Cryptosporidium* level under subsection (i), unfiltered systems shall meet all applicable treatment technique requirements of § 109.202(c) and provide the additional level of treatment for *Cryptosporidium* required under subsections (e)—(h) on a schedule approved by the Department but no later than the schedule in subsection (m).

(m) Cryptosporidium *treatment compliance dates. Cryptosporidium* treatment compliance dates are as follows:

(1) Systems that serve at least 100,000 people shall comply with *Cryptosporidium* treatment requirements by April 1, 2012.

(2) Systems that serve from 50,000 to 99,999 people shall comply with *Cryptosporidium* treatment requirements by October 1, 2012.

(3) Systems that serve from 10,000 to 49,999 people shall comply with *Cryptosporidium* treatment requirements by October 1, 2013.

(4) Systems that serve less than 10,000 people shall comply with *Cryptosporidium* treatment requirements by October 1, 2014.

(5) On a case by case basis within an agreed upon time frame, the Department may allow up to an additional 2 years for complying with the treatment requirement for systems making capital improvements.

(n) *Change in* Cryptosporidium *level for filtered system.* If the bin classification for a filtered system changes following the second round of source water monitoring, as determined under subsection (d), the system shall provide the level of treatment for *Cryptosporidium* required under subsections (e)—(h) on a schedule the Department approves.

(o) *Change in* Cryptosporidium *level for unfiltered system.* If the *Cryptosporidium* level for an unfiltered system changes following the second round of monitoring, as determined under subsection (j), and if the system shall provide a different level of *Cryptosporidium* treatment under subsection (i) and (j) due to this change, the system shall meet this treatment requirement on a schedule the Department approves.

§ 109.1204. Requirements for microbial toolbox components.

(a) A system will receive the treatment credits listed Appendix B to Subchapter L. Microbial Toolbox Summary Table: Options, Treatment Credits and Criteria which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), by meeting the conditions for microbial toolbox components described in subsections (b)—(q). A system shall apply these treatment credits to meet the treatment technique requirements listed in section § 109.1203 (relating to bin classification and treatment technique requirements).

(b) *Watershed control program.* Systems receive 0.5-log *Cryptosporidium* treatment credit for implementing a watershed control program that meets the requirements of this subsection. This credit may not be used to maintain the additional log removal credits specified in

§ 109.1203. This credit may only be applied in addition to the toolbox options used to meet the minimum log removal and may apply in lieu of a toolbox option for which credit has been temporarily revoked.

(1) Systems that intend to apply for the watershed control program credit shall notify the Department of this intent at least 2 years prior to the treatment compliance date applicable to the system in § 109.1203(k)—(o).

(2) Systems shall submit to the Department a proposed watershed control plan at least 1 year before the applicable treatment compliance date in § 109.1203(k)—(o). The Department will approve the watershed control plan for the system to receive watershed control program treatment credit. The watershed control plan must include the following elements:

(i) Identification of an "area of influence" outside of which the likelihood of *Cryptosporidium* or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under paragraph (4)(ii).

(ii) Identification of both potential and actual sources of *Cryptosporidium* contamination and an assessment of the relative impact of these sources on the system's source water quality.

(iii) An analysis of the effectiveness and feasibility of control measures that could reduce *Cryptosporidium* loading from sources of contamination to the system's source water.

(iv) A statement of goals and specific actions the system will undertake 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 roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(3) Systems with existing watershed control programs (that is, programs in place on January 5, 2006) are eligible to seek this credit. Their watershed control plans must meet the criteria in paragraph (2) and must specify ongoing and future actions that will reduce source water *Cryptosporidium* levels.

(4) *Systems shall complete the following* actions *to maintain the 0.5-log credit*:

(i) Submit an annual watershed control program status report to the Department. The annual watershed control program status report must describe the system's implementation of the approved plan and assess the adequacy of the plan to meet its goals. The report must explain how the system is addressing any shortcomings in plan implementation, including those previously identified by the Department or as the result of the watershed survey conducted under subparagraph (ii). The report must also describe significant changes that have occurred in the watershed since the last watershed sanitary survey. If a system determines during implementation that making a significant change to its approved watershed control program is necessary, the system shall notify the Department prior to making any changes. If a change is likely to reduce the level of source water protection, the system shall also list in its notification the actions the system will take to mitigate this effect.

(ii) Undergo a watershed sanitary survey every 3 years for community water systems and every 5 years for noncommunity water systems and submit the survey report to the Department. The survey must be conducted according to Department guidelines and by persons the Department approves.

(A) The watershed sanitary survey must meet the following criteria:

(I) Encompass the region identified in the Department-approved watershed control plan as the area of influence.

(II) Assess the implementation of actions to reduce source water *Cryptosporidium* levels.

(III) Identify any significant new sources of *Cryptosporidium*.

(B) If the Department determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, systems shall undergo another watershed sanitary survey by a date the Department requires, which may be earlier than the regular date in this subparagraph.

(iii) The system shall make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The Department may approve systems to withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

(5) If the Department determines that a system is not carrying out the approved watershed control plan, the Department may withdraw the watershed control program treatment credit.

(c) *Alternative source.*

(1) A system may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the Department approves, a system may determine its bin classification under § 109.1203 based on the alternative source monitoring results.

(2) If systems conduct alternative source monitoring under paragraph (1), systems shall also monitor their current plant intake concurrently as described in § 109.1202 (relating to monitoring requirements).

(3) Alternative source monitoring under paragraph (1) must meet the requirements for source monitoring to determine bin classification, as described in §§ 109.1202 and 109.1205. Systems shall report the alternative source monitoring results to the Department, along with supporting information documenting the operating conditions under which the samples were collected.

(4) If a system determines its bin classification under § 109.1203 using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the system shall relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in § 109.1203(k)—(o).

(d) *Presedimentation.* Systems will receive 0.5-log *Cryptosporidium* treatment credit for a presedimentation basin during any month the process meets the criteria in this subsection.

(1) The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or GUDI source.

(2) The system shall continuously add a coagulant to the presedimentation basin.

(3) The presedimentation basin must achieve the performance criteria as follows:

(i) Demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction must be determined using daily turbidity measurements in the presedimentation process influent and effluent and must be calculated as follows: log10 (monthly mean of daily influent turbidity)-log10 (monthly mean of daily effluent turbidity).

(ii) Comply with Department-approved performance criteria that demonstrate at least 0.5-log mean removal of micron-sized particulate material through the presedimentation process.

(e) *2-stage lime softening.* Systems receive an additional 0.5-log *Cryptosporidium* treatment credit for a 2-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or GUDI source.

(f) *Bank filtration.* Systems receive *Cryptosporidium* treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this subsection. Systems using bank filtration when they begin source water monitoring under § 109.1202(a) shall collect samples as described in § 109.1202(o) and are not eligible for this credit.

(1) Wells with a groundwater flow path of at least 25 feet receive 0.5-log treatment credit. Wells with a groundwater flow path of at least 50 feet receive 1.0-log treatment credit. The groundwater flow path must be determined as specified in paragraph (4).

(2) Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles and minor cement. A system shall characterize the aquifer at the well site to determine aquifer properties. Systems shall extract a core from the aquifer and demonstrate that in at least 90% of the core length, grains less than 1.0 mm in diameter constitute at least 10% of the core material.

(3) Only horizontal and vertical wells are eligible for treatment credit.

(4) For vertical wells, the groundwater flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the groundwater flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

(5) Systems shall monitor each wellhead for turbidity at least once every 4 hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the system shall report this result to the Department and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the Department determines that microbial removal has been compromised, the Department may revoke treatment credit until the system implements corrective actions approved by the Department to remediate the problem.

(6) Springs and infiltration galleries are not eligible for treatment credit under this section, but are eligible for credit under subsection (i).

(7) The Department may approve *Cryptosporidium* treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this paragraph. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in paragraphs (1)—(5).

(i) The study must follow a Department-approved protocol and must involve the collection of data on the removal of *Cryptosporidium* or a surrogate for *Cryptosporidium* and related hydrogeologic and water quality parameters during the full range of operating conditions.

(ii) The study must include sampling both from the production well and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well.

(g) *Combined filter performance.* Systems using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log *Cryptosporidium* treatment credit during any month the system meets the criteria in this subsection. Combined filter effluent (CFE) turbidity must be less than or equal to 0.15 NTU in at least 95% of the measurements. Turbidity must be measured as described in § 109.304(c) (relating to analytical requirements).

(h) *Individual filter performance.* Systems using conventional filtration treatment or direct filtration treatment will receive 0.5-log *Cryptosporidium* treatment credit, which can be in addition to the 0.5-log credit under subsection (g), during any month the system meets the criteria in this subsection. Compliance with these criteria must be based on individual filter turbidity monitoring as described in § 109.301(1)(iv) (relating to general monitoring requirements), as applicable.

(1) The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95% of the measurements recorded each month.

(2) An individual filter may not have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

(3) A system that has received treatment credit for individual filter performance and fails to meet the requirements of paragraph (1) or (2) during any month does not receive a treatment technique violation under § 109.1203(g) if the Department determines the following:

(i) The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

(ii) The system has experienced no more than two of these failures in any calendar year.

(i) *Demonstration of performance.* The Department may approve *Cryptosporidium* treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this subsection. This treatment credit may be greater than or less than the prescribed treatment credits in § 109.1203(e)—

(h) or subsection (d)—(f) and subsections (n)—(q) and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

(1) Systems cannot receive the prescribed treatment credit for any toolbox option in subsections (d)—(f) or (n)—(q) if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this paragraph.

(2) The demonstration of performance study must follow a Department-approved protocol and must demonstrate the level of *Cryptosporidium* reduction the treatment process will achieve under the full range of expected operating conditions for the system.

(3) Approval by the Department will be in writing and may include monitoring and treatment performance criteria that the system shall demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The Department may designate the criteria when necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

(j) *Bag and cartridge filters.* Systems receive *Cryptosporidium* treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the criteria in paragraphs (1)—(10). To be eligible for this credit, systems shall report the results of challenge testing that meet the requirements of paragraphs (2)—(9) to the Department. The filters must treat the entire plant flow taken from a surface water or groundwater source under the direct influence of surface water source.

(1) The *Cryptosporidium* treatment credit awarded to bag or cartridge filters will be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in paragraphs (2)—(9). A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. Systems may use results from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria specified in paragraphs (2)—(9).

(2) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of *Cryptosporidium*. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(3) Challenge testing must be conducted using *Cryptosporidium* or a surrogate that is removed no more efficiently than *Cryptosporidium*. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.

(4) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (that is, filtrate detection limit) and must be calculated using the following equation:

$$\text{Maximum Feed Concentration} = 1 \times 10^4 \times (\text{Filtrate Detection Limit})$$

(5) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(6) Each filter evaluated must be tested for a duration sufficient to reach 100% of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with this subchapter.

(7) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$$LRV = LOG_{10}(C_f)\text{-}LOG_{10}(C_p)$$

Where: LRV = log removal value demonstrated during challenge testing; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C_p must be set equal to the detection limit.

(8) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within 2 hours of start-up of a new filter; when the pressure drop is between 45 and 55% of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100% of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRV_{filter}) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

(9) If less than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest LRV_{filter} among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRV_{filter} values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

(10) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the Department.

(k) *Membrane filtration.*

(1) Cryptosporidium *treatment credit.* Systems receive *Cryptosporidium* treatment credit for membrane filtration that meets the criteria of this paragraph. Membrane cartridge filters that meet the definition of membrane filtration in § 109.1 (relating to definitions) are eligible for this credit. The level of treatment credit a system receives is equal to the lower of the values determined under the following:

(i) The removal efficiency demonstrated during challenge testing conducted under the conditions in paragraph (2).

(ii) The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in paragraph (3).

(2) *Challenge testing.* The membrane used by the system shall undergo challenge testing to evaluate removal efficiency, and the system shall report the results of

challenge testing to the Department. Challenge testing must be conducted according to the criteria in subparagraphs (i)—(vii). Systems may use data from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria in subparagraphs (i)—(vii).

(i) Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system's treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

(ii) Challenge testing must be conducted using *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

(iii) The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

$$\text{Maximum Feed Concentration} = 3.16 \times 10^6 \times (\text{Filtrate Detection Limit})$$

(iv) Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric % of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (that is, backwashing).

(v) Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$LRV = LOG_{10}(C_f) \times LOG_{10}(C_p)$$

Where: LRV = log removal value demonstrated during the challenge test; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

(vi) The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value ($LRV_{C\text{-}Test}$). If less than 20 modules are tested, then $LRV_{C\text{-}Test}$ is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then $LRV_{C\text{-}Test}$ is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

(vii) The challenge test must establish a quality control release value (QCRV) for a nondestructive performance test that demonstrates the *Cryptosporidium* removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify *Cryptosporidium* removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

(viii) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the nondestructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the Department.

(3) *Direct integrity testing.* Systems shall conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in subparagraphs (i)—(vi). A direct integrity test is defined as a physical test applied to a membrane unit to identify and isolate integrity breaches (that is, one or more leaks that could result in contamination of the filtrate).

(i) The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

(ii) The direct integrity method must have a resolution of 3 micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

(iii) The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the Department, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the approach in either clause (A) or (B) as applicable to the type of direct integrity test the system uses.

(A) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}\ (Q_p\ /(VCF \times Q_{breach}))$$

Where: LRV_{DIT} = the sensitivity of the direct integrity test; Q_p = total design filtrate flow from the membrane unit; Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured, and VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

(B) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}(C_f)\text{-}LOG_{10}(C_p)$$

Where: LRV_{DIT} = the sensitivity of the direct integrity test; C_f = the typical feed concentration of the marker

used in the test; and C_p = the filtrate concentration of the marker from an integral membrane unit.

(iv) Systems shall establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the Department.

(v) If the result of a direct integrity test exceeds the control limit established under subparagraph (iv), the system shall remove the membrane unit from service. Systems shall conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

(vi) Systems shall conduct direct integrity testing on each membrane unit at a frequency of at least once each day that the membrane unit is in operation. The Department may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.

(4) *Indirect integrity monitoring.* Systems shall conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in subparagraphs (i)—(v). Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A system that implements continuous direct integrity testing of membrane units in accordance with the criteria in subparagraphs (i)—(v) is not subject to the requirements for continuous indirect integrity monitoring. Systems shall submit a monthly report to the Department summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

(i) Unless the Department approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

(ii) Continuous monitoring must be conducted at least once every 15 minutes.

(iii) Continuous monitoring must be separately conducted on each membrane unit.

(iv) If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (that is, two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit as specified in paragraph (3)(i)—(v).

(v) If indirect integrity monitoring includes a Department-approved alternative parameter and if the alternative parameter exceeds a Department-approved control limit for a period greater than 15 minutes, direct integrity testing shall immediately be performed on the associated membrane units as specified in paragraph (3)(i)—(v).

(l) *Second stage filtration.* Systems receive 0.5-log *Cryptosporidium* treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC or other fine grain media following granular media filtration if approved by the Department. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or GUDI source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The Department will approve the treatment credit based on an assessment of the design characteristics of the filtration process.

(m) *Slow sand filtration (as secondary filter).* Systems are eligible to receive 2.5-log *Cryptosporidium* treatment credit for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or GUDI source and no disinfectant residual is present in the influent water to the slow sand filtration process. The Department will approve the treatment credit based on an assessment of the design characteristics of the filtration process. This subsection does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

(n) *Inactivation toolbox components.* Calculation of CT values.

(1) Systems with treatment credit for chlorine dioxide or ozone under subsection (o) or (p) must calculate CT at least once each day, with both C and T measured during peak hourly flow as specified in § 109.304(c) and 40 CFR 141.74(b)(3) (relating to analytical and monitoring requirements).

(2) Systems with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, systems shall add the *Cryptosporidium* CT values in each segment to determine the total CT for the treatment plant.

(o) *Chlorine dioxide.* Systems are eligible to receive the *Cryptosporidium* treatment credit listed in Table 1, CT Values (mg • min/L) for *Cryptosporidium* Inactivation by Chlorine Dioxide, contained in Appendix A to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in subsection (n).

(p) *Ozone.* Systems receive the *Cryptosporidium* treatment credit listed in Table 2, CT Values (mg • min/L) for *Cryptosporidium* Inactivation by Ozone, contained in Appendix A to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), by meeting the corresponding ozone CT values for the applicable water temperature, as described in subsection (n).

(q) *Ultraviolet light.* Systems receive *Cryptosporidium, Giardia lamblia* and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in Table 3, UV Dose for *Cryptosporidium, Giardia lamblia* and Virus Inactivation, contained in Appendix A to Subchapter L which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble), as described in paragraph (1). Systems shall validate and monitor UV reactors as described in paragraphs (2) and (3) to demonstrate that they are achieving a particular UV dose value for treatment credit.

(1) *UV dose table.* The treatment credits listed in Table 3 are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems shall demon-

strate an equivalent germicidal dose through reactor validation testing, as described in paragraph (2). The UV dose values in this table are applicable only to post-filter applications of UV in filtered systems.

(2) *Reactor validation testing.* Systems shall use UV reactors that have undergone validation testing, conducted by a party acceptable to the Department, to determine the operating conditions under which the reactor delivers the UV dose required in paragraph (1) (that is, validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor and UV lamp status.

(i) When determining validated operating conditions, systems shall account for the following factors:

(A) UV absorbance of the water.

(B) Lamp fouling and aging.

(C) Measurement uncertainty of on-line sensors.

(D) UV dose distributions arising from the velocity profiles through the reactor.

(E) Failure of UV lamps or other critical system components.

(F) Inlet and outlet piping or channel configurations of the UV reactor.

(ii) Validation testing must include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

(iii) The Department may accept alternative validation testing approaches, if these approaches are first approved by the EPA.

(3) *Reactor monitoring.*

(i) Systems shall monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under paragraph (2). This monitoring must include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the Department designates based on UV reactor operation. Systems shall verify the calibration of UV sensors and shall recalibrate sensors in accordance with a protocol the Department approves.

(ii) To receive treatment credit for UV light, systems shall treat at least 95% of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in paragraphs (1) and (2). Systems shall demonstrate compliance with this condition by the monitoring required under subparagraph (i).

§ 109.1205. Reporting and recordkeeping requirements.

(a) *Source water reporting time frame.* Systems shall report results from the source water monitoring required under § 109.1202 (relating to monitoring reqirements) no later than 10 days after the end of the first month following the month when the sample is collected.

(b) *Methods for reporting initial source water monitoring results to EPA.* Systems serving at least 10,000 people shall report as follows:

(1) All systems serving at least 10,000 people shall report the results from the initial source water monitoring required under § 109.1202(a) to the EPA electronically at https://intranet.epa.gov/lt2/.

(2) If a system is unable to report monitoring results electronically, the system may use an alternative approach for reporting monitoring results the EPA approves.

(c) *Methods for reporting initial source water monitoring results to the Department.* Systems serving less than 10,000 people shall report results from the initial source water monitoring required under § 109.1202(a) to the Department using a method approved by the Department.

(d) *Methods for reporting second round of source water monitoring results to the Department.* All systems shall report results from the second round of source water monitoring required under § 109.1202(b) to the Department using a method approved by the Department

(e) *Source water reporting data elements.* Systems shall report the applicable information in paragraphs (1) and (2) for the source water monitoring required under § 109.1202.

(1) Cryptosporidium *data elements.* Systems shall report data elements in subparagraphs (i)—(vii) for each *Cryptosporidium* analysis. Systems shall report data elements in subparagraphs (viii)—(x) as applicable.

(i) PWS ID.

(ii) Facility ID.

(iii) Sample collection date.

(iv) Sample type (field or matrix spike).

(v) Sample volume filtered (L), to nearest \1/4\L.

(vi) Indicate whether 100% of filtered volume was examined.

(vii) Number of oocysts counted.

(viii) For matrix spike samples, systems shall also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(ix) For samples in which less than 10 L is filtered or less than 100% of the sample volume is examined, systems shall also report the number of filters used and the packed pellet volume.

(x) For samples in which less than 100% of sample volume is examined, systems shall also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(2) E. coli *data elements.* Systems shall report the following data elements for each E. coli analysis:

(i) PWS ID.

(ii) Facility ID.

(iii) Sample collection date.

(iv) Analytical method number.

(v) Method type.

(vi) Source type (flowing stream, lake/reservoir, GUDI).

(vii) *E. coli*/100 mL.

(viii) Turbidity.

(f) *Grandfathering data.* Grandfathering previously collected data requirements, established by the EPA under the National Primary Drinking Water regulations in 40 CFR 141.707 (relating to grandfathering previously collected data) are incorporated by reference except as otherwise established by this chapter.

(g) *Sampling schedule reporting.* Systems shall report sampling schedules under § 109.1202(i)—(k) and source

water monitoring results under subsections (a)—(e) unless they notify the Department that they will not conduct source water monitoring due to meeting the criteria of § 109.1202(d).

(h) *Bin classification reporting.* Systems shall report their *Cryptosporidium* bin classification as follows:

(1) Systems shall report their initial bin classification under § 109.1203(c) (relating to bin classification and treatment technique requirements) to the Department for approval no later than 6 months after the system is required to complete initial source water monitoring based on the schedule in § 109.1202(c).

(2) Systems shall report their bin classification under § 109.1203(c) to the Department for approval no later than 6 months after the system is required to complete the second round of source water monitoring based on the schedule in § 109.1202(c).

(3) The bin classification report to the Department will include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

(4) Failure to comply with the conditions of this subsection is a violation of the treatment technique requirement.

(i) *Microbial toolbox reporting requirements.* Systems are required to report items specified § 109.1204 (relating to requirements for microbial toolbox components) for all toolbox components for which they are requesting treatment credit. Systems must report to the State in accordance with Appendix C to subchapter L. Microbial Toolbox Reporting Requirements which is available from the Department at www.depweb.state.pa.us (DEP Keyword: Participation; select "Proposals Currently Open for Comment" or through the Contact Persons listed in the Preamble). .

(j) *Reporting significant change in disinfection practices.* Prior to making a significant change in disinfection practice, systems shall report disinfection profiles and benchmarks to the Department as established by the EPA under the National Primary Drinking Water regulations in 40 CFR 141.708 and 141.709 (relating to requirements when making a significant change in disinfection practice; and developing the disinfection profile and benchmark), which are incorporated by reference in § 109.204 (relating to disinfection profiling and benchmarking).

(k) *Source water monitoring recordkeeping requirements.* Systems shall keep results from the initial round of source water monitoring under § 109.1202(a) and the second round of source water monitoring under § 109.1202(b) until 3 years after bin classification under § 109.1203 (b) and (c).

(l) Notification retention systems shall keep any notification to the Department that they will not conduct source water monitoring due to meeting the criteria of § 109.1202(d) for 3 years.

(m) Results retention systems shall keep the results of treatment monitoring associated with microbial toolbox options under § 109.1204, as applicable, for 3 years.

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[25 PA. CODE CH. 109]

Safe Drinking Water (Stage 2 Disinfectants and Disinfection Byproducts Rule)

The Environmental Quality Board (Board) proposes to amend Chapter 109 (relating to safe drinking water). The amendments will supplement the Stage 1 Disinfectants and Disinfection Byproduct Rule by requiring water systems to meet disinfection byproduct maximum contaminant levels (MCLs) at each monitoring site in the distribution system. The amendments will first focus on identifying the higher risk monitoring locations through the Initial Distribution System Evaluation (IDSE) and then addresses reducing exposure and lowering disinfectant byproducts (DBPs) peaks in distribution systems by using a new method to determine MCL compliance (Locational Running Annual Average (LRAA)).

The amendments will reduce the potential risks of cancer and reproductive and developmental health effects associated with DBPs by reducing peak and average levels of DBPs in drinking water supplies.

The amendments will apply to community water systems (CWSs) and nontransient noncommunity water systems (NTNCWSs) that add a primary or residual disinfectant other than ultraviolet light (UV) or deliver water that has been treated with a primary or residual disinfectant other than UV.

This proposal was adopted by the Board at its meeting of August 19, 2008.

A. *Effective Date*

These amendments will go into effect upon publication in the *Pennsylvania Bulletin* as final-form rulemaking.

B. *Contact Persons*

For further information, contact Ronald Furlan, Chief, Division of Planning and Permits, P. O. Box 8774, Rachel Carson State Office Building, Harrisburg, PA 17105-8774, (717) 787-8184 or Marylou Barton, Assistant Counsel, Bureau of Regulatory Counsel, P. O. Box 8464, Rachel Carson State Office Building, Harrisburg, PA 17105-8464, (717) 787-7060. Persons with a disability may use the Pennsylvania AT&T Relay Service by calling (800) 654-5984 (TDD users) or (800) 654-5988 (voice users). The proposal is available electronically through the Department of Environmental Protection's (DEP) web site www.depweb.state.pa.us.

C. *Statutory Authority*

The proposed rulemaking is being made under the authority of section 4 of the Pennsylvania Safe Drinking Water Act (SDWA) (35 P. S. § 721.4), which grants the Board the authority to adopt rules and regulations governing the provision of drinking water to the public, and sections 1917-A and 1920-A of The Administrative Code of 1929 (71 P. S. §§ 510-7 and 510-20).

D. *Background and Purpose*

The public health benefits of disinfection are significant and well-recognized. However, these very disinfection practices pose health risks of their own. Although disinfectants such as chlorine, hypochlorites and chlorine dioxide are effective in controlling many harmful microorganisms, they react with organic and inorganic matter in the water to form DBPs, which pose health risks at certain levels.

The first DBPs discovered in public drinking water were halogenated methanes in 1974. As a result, the

United States Environmental Protection Agency (EPA) promulgated a MCL for the composite sum of four individual DBP species: chloroform, bromodichloromethane, dibromochloromethane and bromoform. This composite sum was termed "Total Trihalomethanes" (TTHMs) and had an MCL of 0.1 mg/L that was applied only to community water systems serving at least 10,000 people.

Since the discovery of TTHMs in drinking water in 1974, other DBPs have been identified and studied for their health effects. Many of these studies have shown DBPs to be carcinogenic or to cause reproductive or developmental, or both, effects in laboratory animals. Studies have also shown that high levels of the disinfectants themselves may cause health problems over long periods of time, including damage to both the blood and the kidneys. While many of these studies have been conducted at high doses, the weight of the evidence indicates that DBPs present a potential public health problem that must be addressed.

In 1992, the EPA initiated a rulemaking process to address public health concerns associated with disinfectants, DBPs and microbial pathogens. As part of this rulemaking process, the EPA established a Regulatory Negotiation (Reg/Neg) Committee, which included representatives of state and local health and regulatory agencies, public water systems, elected officials, consumer groups and environmental groups.

The EPA's most significant concern in developing regulations for disinfectants and DBPs was the need to ensure that adequate treatment be maintained for controlling risks from microbial pathogens. One of the major goals addressed in the rulemaking process was to develop an approach that would reduce the level of exposure from disinfectants and DBPs without undermining the control of microbial pathogens. The intention was to ensure that drinking water is microbiologically safe at the limits set for disinfectants and DBPs and that these chemicals do not pose an unacceptable health risk at these limits. Thus, the Reg/Neg Committee also considered a range of microbial issues and agreed that the EPA should also propose a companion microbial rule, the *Interim Enhanced Surface Water Treatment Rule* (IESWTR).

Following months of intensive discussions and technical analysis, the Reg/Neg Committee recommended the development of three sets of rules: a two-stage rule to address disinfectants and DBPs (D/DBPs), the IESWTR and an *Information Collection Rule* (ICR). The approach used in developing these proposals considered the constraints of simultaneously treating water to control microbial contaminants, disinfectants and D/DBPs. The Reg/Neg Committee agreed that the schedule for the IESWTR should be linked to the schedule of the first stage of the D/DBPs rule to assure simultaneous compliance and a balanced risk-risk based implementation. The Reg/Neg Committee also agreed that additional information on health risk, occurrence, treatment technologies and analytical methods needed to be developed to better understand the risk-risk tradeoff, and how to accomplish an overall reduction in health risks to both pathogens and D/DBPs. Finally the Reg/Neg Committee agreed that to develop a reasonable set of rules and to understand more fully the limitations of the current Surface Water Treatment Rule, additional field data were critical. Thus, a key component of the regulation negotiation agreement was the promulgation of the ICR.

The *Federal Disinfectants and Disinfection Byproducts Rule* (D/DBPR) (40 CFR Parts 9, 141 and 142 (relating to OMB approvals under the paperwork reduction act; National primary drinking water regulations; and National primary drinking water regulations implementation)), which was promulgated on December 16, 1998, was developed based on the outcome of this rulemaking process, as well as a wide range of technical comments from stakeholders and members of the public. Pennsylvania adopted the Stage 1 DBPR on July 21, 2001.

The Stage 1 DBPR regulated treatment practices at public water systems to eliminate or minimize disinfectant levels and DBPs that may cause harmful health effects. The Stage 1 DBPR applied to all community and nontransient noncommunity water systems that use a chemical disinfectant or oxidant, as well as to all transient noncommunity water systems that use chlorine dioxide. The Stage 1 DBPR established maximum residual disinfectant levels (MRDLs) for free chlorine, combined chlorine and chlorine dioxide. MCLs were also established for TTHM, five haloacetic acids (HAA5), bromate (calculated as running annual average (RAA)) and chlorite based on daily and monthly sampling. The MCL for TTHMs was lowered from 0.1 mg/L to 0.08 mg/L and applied to all community and nontransient noncommunity water systems, regardless of the population that is served. The Stage 1 DBPR also regulated prefiltration treatment techniques for public water systems that use conventional filtration to reduce source water Total Organic Carbon (TOC), which serves as a precursor to DBP.

The EPA promulgated the Federal Stage 2 DBPR on January 4, 2006. Congress required the EPA to promulgate the Stage 2 DBPR as part of the 1996 SDWA Amendments. The Stage 2 DBPR augments the Stage 1 DBPR. The goal of the Stage 2 DBPR is to target the highest risk systems for changes beyond those required for Stage 1 DBPR. The new requirements will provide for more consistent, equitable protection from DBPs across the entire distribution system and the reduction of DBP peaks. New risk-targeting provisions require systems to first identify their risk level; then, only those systems with the greatest risk will need to make operational or treatment changes. The Stage 2 DBPR will first focus on identifying the higher risk monitoring locations through the IDSE and then addresses reducing exposure and lowering DBP peaks in distribution systems by using a new method to determine MCL compliance (LRAA). The rule will also define operational evaluation levels.

As in Stage 1 DBPR, the Stage 2 DBPR will focus on monitoring for and reducing concentrations of two classes of DBPs: TTHM and HAA5. These two groups of DBPs act as indicators for the various byproducts that are present in water disinfected with chlorine or chloromine. This means that concentrations of TTHM and HAA5 are monitored for compliance, but their presence in drinking water is representative of many other chlorination DBPs that may also occur in the water; thus, a reduction in TTHM and HAA5 generally indicates an overall reduction of DBPs.

The Board proposes to incorporate the provisions of the Federal Stage 2 DBPR into Chapter 109.

The draft proposed amendments were submitted for review to the Small Water Systems Technical Assistance Center Advisory Board (TAC) for review and discussion on November 15, 2007. The TAC Board noted that the revisions are required for the Department to receive primacy and are not more stringent than the Federal rule. The TAC Board approved the proposed revisions in a letter dated December 12, 2007.

E. *Summary of Regulatory Requirements*

The proposed amendments reflect, and are no more stringent than the new Federal Stage 2 DBPR requirements.

1. *§ 109.1. Definitions.*

This section was amended to add the following EPA definitions: "combined distribution systems," "dual sample set," "locational running annual average," "running annual average and wholesale systems." The definition of "finished water" was also amended. These amendments reflect the new definitions of the Federal Stage 2 DBPR found in 40 CFR 141.2 (relating to definitions).

2. *§ 109.301(12). Monitoring requirements for disinfection byproducts and disinfection byproduct precursors.*

This paragraph was revised to incorporate the EPA's new monitoring requirements for the Stage 2 DBPR. This amendment reflects the Federal requirements found in 40 CFR 141.132(a), (b) (relating to monitoring requirements), and (d) and 40 CFR 141.620—141.623.

3. *§ 109.301(12)(i)(B)(I)(-c-). TTHM and HAA5 Stage 1 DBP Rule.*

A new item was added to incorporate the EPA's minor changes to Stage 1 DBPR which did not specify a time frame or sampling frequency for taking TOC source water samples. The Stage 2 DBPR requires systems to take TOC samples every 30 days at a location prior to treatment. These samples must be averaged quarterly for the most recent 4 quarters. Once a system has qualified for reduced monitoring it may reduce source water TOC monitoring to one sample every 90 days. This amendment reflects the Federal requirement found in 40 CFR 141.132(b)(1)(iii).

4. *§ 109.301(12)(ii). TTHM and HAA5 Stage 2 DBP Rule.*

This new subparagraph was added to incorporate the monitoring requirements of the Stage 2 DBPR. The subparagraph establishes monitoring and other requirements for achieving compliance with the MCLs based on LRAA for TTHM and HAA5 and for achieving compliance with the MRDLs for chlorine and chloramines for certain consecutive systems. The amendment reflects the Federal requirements in 40 CFR 141.620—141.623.

5. *§ 109.301(12)(ii)(A). Applicability and schedule.*

A new clause was added to incorporate the EPA's schedule for Stage 2 DBPR. The amendment reflects the Federal requirements in 40 CFR 141.620 (relating to general requirements).

6. *§ 109.301(12)(ii)(B). Routine monitoring.*

A new clause was added to incorporate the EPA's routine monitoring requirements for Stage 2 DBPR. The amendment reflects the Federal requirements in 40 CFR 141.621 (relating to routine monitoring).

7. *§ 109.301(12)(ii)(C). Reduced monitoring.*

A new clause was added to incorporate the EPA's reduced monitoring requirements for Stage 2 DBPR. The amendment reflects the Federal requirements in 40 CFR 141.623 (relating to reduced monitoring).

8. *§ 109.301(12)(ii)(D). Increased monitoring.*

A new clause was added to incorporate the EPA's conditions requiring increased monitoring. The amendment reflects the Federal requirements in 40 CFR 141.625 (relating to conditions requiring increased monitoring).

9. *§ 109.301(12)(ii)(E). General monitoring and compliance requirements.*

A new clause was added to incorporate the EPA's general monitoring and compliance requirements. The amendment reflects the Federal requirements in 40 CFR 141.620(c)(7), (d)(1) and (2), and 141.620(e).

10. *§ 109.301(12)(iv). Bromate.*

A new subclause was added to incorporate the EPA's minor changes to Stage 1 DBPR. Under the Stage 1 DBPR, systems that use ozone are required to monitor water in the distribution system for bromate whose MCL is 0.010 mg/L RAA. Under the Stage 2 DBPR, the criterion for reduced bromate monitoring is a bromate RAA less than or equal to 0.0025 mg/L. The amendment reflects the Federal requirements in 40 CFR 141.132(b)(3)(ii)(A) and (B).

11. *§ 109.701(g)(2). Monitoring plans for disinfectants, disinfection byproducts and disinfection byproduct precursors.*

This paragraph was revised to incorporate the EPA's new monitoring plans for D/DBPs and DBP precursors requirements under Stage 2 DBPR. This amendment reflects the Federal requirements found in 40 CFR 141.620 and 141.621.

12. *§ 109.701(g)(1)(iii).*

This new subparagraph was added to incorporate the EPA's new monitoring plan requirements. This amendment reflects Federal requirements found in 40 CFR 141.33(f) (relating to record maintenance).

13. *§ 109.701(g)(2)(i). IDSE Requirements.*

This subparagraph was added to incorporate by reference the EPA's IDSE requirements. The amendment reflects Federal requirements found in 40 CFR 141.600—141.605 (relating to initial distribution system evaluations).

14. *§ 109.701(g)(2)(ii). Subchapter G monitoring plan.*

This subparagraph was added to incorporate the EPA's monitoring plan requirements under the Stage 2 DBPR. The amendment reflects Federal requirements found in 40 CFR 141.622 (relating to Subpart V monitoring plan).

15. *§ 109.701(g)(2)(iii). Operational evaluation level.*

This subparagraph was added to incorporate the EPA's new operational evaluation level requirements. The amendment reflects Federal requirements found in 40 CFR 141.626 (relating to operational evaluation levels).

TTHM and HAA5 MCL compliance is based on an LRAA, therefore a system may have individual DBP results significantly higher than the MCL from time to time while remaining in compliance. This situation is a result of the fact that high concentrations are averaged with lower concentrations at a given location. While this situation does not constitute an MCL violation, it might indicate a trend that could lead to an MCL violation in future quarters.

The operational evaluation level is an LRAA threshold, meant to help systems identify if they are in danger of exceeding the MCL in the following monitoring quarter. The process is useful in that it alerts the system to the potential of an MCL violation if DBP levels remain at their current level and encourages them to consider what operational changes may be necessary to reduce DBP levels.

The operational evaluation level at any location is the sum of the two previous quarters' TTHM or HAA5 results plus the current quarter's TTHM or HAA5 result, divided by four to determine an average. If the operational evaluation level for TTHM exceeds 0.080 mg/L or the operational evaluation level for HAA5 exceeds 0.060 mg/L at any monitoring location, an exceedance of the operational evaluation level has occurred.

If this happens, the system must conduct an operational evaluation and submit a written report of the evaluation to the Department no later than 90 days after the system is notified of the analytical result that caused the exceedance.

16. *§ 109.1003(a)(1)(viii). Monitoring requirements.*

This subparagraph was revised to incorporate the EPA's TTHM and HAA5 bromate monitoring requirements for bottled water systems. This amendment reflects the Federal requirements found in 40 CFR 141.132(b)(1)(iii).

17. *§ 109.1003(a)(1)(x)(B). Monitoring requirements.*

This subclause was revised to incorporate the EPA's bromate reduced monitoring requirements for bottled water systems. This amendment reflects the Federal requirements found in 40 CFR 141.132(b)(3)(ii).

F. *Benefits, Costs and Compliance*

Benefits

The public health benefits of disinfection practices are significant and well-recognized. Disinfection, however, poses its own health risks. The proposed amendments will improve public health by increasing level of protection from exposure to DBP's through providing more consistent, equitable protection from DBPs across the entire distribution systems and the reduction of DBP peaks.

The proposed amendments will affect all CWSs (almost 2,042) and NTHCWSs (almost 600) serving about 10.5 million Pennsylvanians. These 10.5 million people will benefit from a reduction in health risks associated with disinfection practices, such as bladder cancer and kidney damage.

The EPA has estimated that the Nation may realize a total annual benefit of up to $3.5 billion as a result of avoiding up to 581 cases of bladder cancer per year. In this Commonwealth, this translates into a total annual benefit of up to $144 million in avoiding up to 24 cases of bladder cancer per year.

Compliance Costs

The EPA has estimated that the mean annual cost of approximately $77 million will be borne by the regulated community, Nationwide, as a result of this rule. It is estimated that water systems in this Commonwealth will bear nearly $3.39 million of this total annual cost.

The $3.39 million estimate will include nontreatment costs of rule implementation, IDSE, Stage 2 DBPR monitoring plans, additional routine monitoring, reporting, recordkeeping and operational evaluations. Systems required to install treatment to comply with MCLs will accrue the additional costs of treatment installation as well as Operation and Maintenance.

Compliance Assistance Plan

The Safe Drinking Water Program utilizes the Commonwealth's PENNVEST Program to offer financial assistance to eligible public water systems. This assistance is in the form of a low-interest loan, with some augmenting grant funds for hardship cases. Eligibility is based upon factors such as public health impact, compliance necessity and project/operational affordability.

The Safe Drinking Water Program has established a network of regional and central office training staff that is responsive to identifiable training needs. The target audience in need of training may be either program staff or the regulated community.

In addition to this network of training staff, the Bureau of Water Standards and Facility Regulation have staff dedicated to providing both training and outreach support services to public water system operators. The DEP internet site also contains the *Drinking Water & Wastewater Treatment System Operator Information Center* internet site, which provides a bulletin board of timely, useful information for treatment plant operators.

Paperwork Requirements

The proposed amendments will involve monitoring activities, which include conducting the IDSE, Stage 2 DBPR monitoring plans, additional routine monitoring and operational evaluations. Water systems which treat with conventional filtration will also need to monitor and report total organic carbon, both in the source water and in the treated water.

It is anticipated that this additional monitoring and reporting will be easily facilitated by the addition of one or two new data reporting forms and that little additional paperwork will be necessary.

G. *Sunset Review*

These regulations will be reviewed in accordance with the sunset review schedule published by the DEP to determine whether the regulations effectively fulfill the goals for which they were intended.

H. *Regulatory Review*

Under section 5(a) of the Regulatory Review Act (71 P. S. § 745.5(a)), on November 24, 2008, the DEP submitted a copy of these proposed amendments to the Independent Regulatory Review Commission (IRRC) and the Chairpersons of the House and Senate Environmental Resources and Energy Committees (Committees). In addition to submitting the proposed amendments, the DEP has provided IRRC and the Committees with a copy of a detailed Regulatory Analysis Form prepared by the DEP. A copy of this material is available to the public upon request.

Under section 5(g) of the Regulatory Review Act, IRRC may convey any comments, recommendations or objections to the proposed amendments within 30 days of the close of the public comment period. The comments, recommendations or objections shall specify the regulatory review criteria that have not been met. The Regulatory Review Act specifies detailed procedures for review of these issues by the DEP, the General Assembly and the Governor prior to final publication of the regulations.

I. *Public Comments*

Written Comments—Interested persons are invited to submit comments, suggestions or objection regarding the proposed regulation to the Environmental Quality Board, P. O. Box 8477, Harrisburg, PA 17105-8477 (express mail: Rachel Carson State Office Building, 16th Floor, 400 Market Street, Harrisburg, PA 17105-2301). Comments submitted by facsimile will not be accepted. Comments, suggestions or objections must be received by the Board by January 20, 2009. Interested persons may also submit a summary of their comments to the Board. The sum-

mary may not exceed one page in length and must also be received by January 20, 2009. The one-page summary will be provided to each member of the Board in the agenda packet distributed prior to the meeting at which the final regulations will be considered.

Electronic Comments—Comments may be submitted electronically to the Board at RegComments@state.pa.us and must also be received by the Board by January 20, 2009. A subject heading of the proposal and a return name and address must be included in each transmission. If an acknowledgement of electronic comments is not received by the sender within 2 working days, the comments should be retransmitted to ensure receipt.

JOHN HANGER
Acting Chairperson

Fiscal Note: 7-427. No fiscal impact; (8) recommends adoption. Proposed rulemaking will have no net cost increase to the Commonwealth. State agencies that use licensed radioactive material or radiation-producing machines have paid license fees in the past and will be subject to the increased fees. Those costs are expected to be nominal.

Annex A

TITLE 25. ENVIRONMENTAL PROTECTION

Subpart C. PROTECTION OF NATURAL RESOURCES

ARTICLE II. WATER RESOURCES

CHAPTER 109. SAFE DRINKING WATER

Subchapter A. GENERAL PROVISIONS

§ 109.1. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

* * * * *

***Combined distribution system*—The interconnected distribution system consisting of the distribution systems of wholesale systems and of the public water systems that obtain finished water from another public water system.**

* * * * *

***DBP*—Disinfection byproduct.**

* * * * *

***Dual sample set*—A set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE and determining compliance with the TTHM and HAA5 MCLs under Subchapter G (relating to system management responsibilities).**

* * * * *

Finished water—**[Water that has been treated in compliance with the treatment technique requirements established in this chapter by a permitted public water system and is ready for consumption by the public.] Water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as necessary to maintain water quality in the distribution system (for example, booster disinfection or addition of corrosion control chemicals).**

* * * * *

***IDSE*—Initial Distribution System Evaluation.**

* * * * *

***LRAA*—Locational running annual average—The average, computed quarterly, of quarterly arithmetic averages of all analytical results for samples taken at a particular monitoring location during the most recent 4 calendar quarters.**

* * * * *

***RAA*—Running annual average—The average, computed quarterly, of quarterly arithmetic averages of all analytical results for samples taken during the most recent 4 calendar quarters.**

* * * * *

***Wholesale system*—A public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.**

Subchapter C. MONITORING REQUIREMENTS

§ 109.301. General monitoring requirements.

The monitoring requirements established by the EPA under the National Primary Drinking Water Regulations, 40 CFR Part 141 (relating to national primary drinking water regulations), as of December 8, 1984, are incorporated by reference. Public water suppliers shall monitor for compliance with MCLs and MRDLs in accordance with the requirements established in the National Primary Drinking Water Regulations, except as otherwise established by this chapter unless increased monitoring is required by the Department under § 109.302 (relating to special monitoring requirements). Alternative monitoring requirements may be established by the Department and may be implemented in lieu of monitoring requirements for a particular National Primary Drinking Water Regulation if the alternative monitoring requirements are in conformance with the Federal act and regulations. The monitoring requirements shall be applied as follows:

* * * * *

(8) *Monitoring requirements for public water systems that obtain finished water from another public water system.*

* * * * *

(ii) Community consecutive water suppliers shall**[:**

(A) Monitor for compliance with the MCL for TTHMs established under 40 CFR 141.12 (relating to maximum contaminant levels for total trihalomethanes) in accordance with 40 CFR 141.30 (relating to total trihalomethanes sampling, analytical and other requirements) if the system does one of the following:

(I) Serves more than 10,000 persons.

(II) Obtains finished water from another public water system serving more than 10,000 persons.

(B) Monitor] monitor the distribution system for compliance with the MCL for asbestos at the frequency indicated in paragraph (7)(i), when the Department determines that the system's distribution system contains asbestos cement pipe and optimum corrosion control measures have not been implemented.

* * * * *

(12) *Monitoring requirements for disinfection byproducts and disinfection byproduct precursors.* Community water systems and nontransient noncommunity water systems that use a chemical disinfectant or oxidant shall monitor for disinfection byproducts and disinfection byproduct precursors in accordance with this paragraph. Community water systems and nontransient noncommunity water systems that obtain finished water from another public water system that uses a chemical disinfectant or oxidant to treat the finished water shall monitor for TTHMs and HAA5 in accordance with this paragraph. Systems that use either surface water or GUDI sources and that serve at least 10,000 persons shall begin monitoring by January 1, 2002. Systems that use either surface water or GUDI sources and that serve fewer than 10,000 persons, or systems that use groundwater sources, shall begin monitoring by January 1, 2004. Systems monitoring for disinfection byproducts and disinfection byproduct precursors shall take all samples during normal operating conditions. Systems monitoring for disinfection byproducts and disinfection byproduct precursors shall use only data collected under this chapter to qualify for reduced monitoring. Compliance with the MCLs and monitoring requirements for TTHMs, HAA5, chlorite (where applicable) and bromate (where applicable) shall be determined in accordance with 40 CFR 141.132 and 141.133 (relating to monitoring requirements; and compliance requirements) which are incorporated herein by reference.

(i) *TTHMs and HAA5* ***Stage 1 DBP Rule.***

* * * * *

(B) *Reduced monitoring.* Systems shall monitor for TTHMs and HAA5 for at least 1 year prior to qualifying for reduced monitoring. Systems serving at least 500 persons and that use either surface water or GUDI sources shall monitor source water TOC monthly for at least 1 year prior to qualifying for reduced monitoring. The Department retains the right to require a system that meets the requirements of this clause to resume routine monitoring.

(I) For systems serving at least 500 persons that use either surface water or GUDI sources and that have a source water TOC running annual average that is no greater than 4.0 mg/L, a TTHM running annual average that is no greater than 0.040 mg/L and an HAA5 running annual average that is no greater than 0.030 mg/L, the required monitoring is reduced according to items (-a-) and (-b-). Systems serving at least 10,000 persons shall resume routine monitoring as prescribed in clause (A) if the TTHM running annual average exceeds 0.060 mg/L or the HAA5 running annual average exceeds 0.045 mg/L. Systems serving from 500 to 9,999 persons shall resume routine monitoring as prescribed in clause (A) if the annual TTHM average exceeds 0.060 mg/L or the annual HAA5 average exceeds 0.045 mg/L. Systems serving at least 500 persons that must resume routine monitoring shall resume routine monitoring in the quarter immediately following the quarter in which the system exceeded the specified TTHM or HAA5 criteria.

* * * * *

(-c-) Beginning April 1, 2008, systems not monitoring under the provisions of subparagraph (ii) shall take monthly TOC samples every 30 days at a location prior to any treatment, to qualify for reduced monitoring for TTHM and HAA5 under this subparagraph. In addition to meeting other criteria for reduced monitoring in this section, the source water TOC running annual average must be less than 4.0 mg/L (based on the most recent 4 quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under this section, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

(II) For systems that use only groundwater sources not included under subclause (I), the required monitoring is reduced according to the following:

* * * * *

(-b-) For systems serving fewer than 10,000 persons that have an annual TTHM average that is no greater than 0.040 mg/L and an annual HAA5 average that is no greater than 0.030 mg/L for 2 consecutive years or an annual TTHM average that is no greater than 0.020 mg/L and an annual HAA5 average that is no greater than 0.015 mg/L for 1 year, the required monitoring is reduced to one sample per 3-year cycle per treatment plant. The sample shall be taken at a location that represents a maximum residence time during the month of warmest water temperature. The 3-year cycle shall begin on January 1 following the quarter in which the system qualifies for reduced monitoring. If the TTHM **annual** average exceeds 0.060 mg/L, or the HAA5 **annual** average exceeds 0.045 mg/L the system shall resume routine monitoring as prescribed in clause (A), except that systems that exceed either a TTHM or HAA5 MCL shall increase monitoring to at least one sample per quarter per treatment plant beginning in the quarter immediately following the quarter in which the system exceeds the TTHM or HAA5 MCL.

(ii) **TTHMs and HAA5 Stage 2 DBP Rule.**

(A) ***Applicability and schedule.***

(I) Community water systems and nontransient noncommunity water systems using a primary or residual disinfectant other than ultraviolet light or delivering water that has been treated with a primary or residual disinfectant other than ultraviolet light shall monitor for compliance with the MCLs based on the LRAA for TTHMs and HAA5. A consecutive system or wholesale system shall comply at the same time as the system with the earliest compliance date in the combined distribution system. Systems shall comply with the requirements of this subparagraph as follows:

(-a-) Systems serving 100,000 or more people begin April 1, 2012.

(-b-) Systems serving from 50,000 to 99,999 people begin October 1, 2012.

(-c-) Systems serving from 10,000 to 49,999 people begin October 1, 2013.

(-d-) Systems serving less than 10,000 people:

(-1-) Begin October 1, 2013, if no Cryptosporidium monitoring is required under §§ 109.1201—109.1204. (*Editor's Note*: §§ 109.1201—109.1204 are proposed to be added at 38 Pa.B. 7035 (December 20, 2008.)

(-2-) Begin October 1, 2014, if Cryptosporidium monitoring is required under §§ 109.1201—109.1204.

(II) For the purpose of the schedule under this subparagraph, the Department may determine that

the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The Department may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

(B) *Routine monitoring.*

(I) A system that submitted an IDSE report shall begin monitoring at the locations and months recommended in the IDSE report unless the Department notifies the system that other locations or additional locations are required. A system that submitted a 40/30 certification, or qualified for a very small system waiver or a nontransient noncommunity water system serving less than 10,000, shall monitor at the locations and dates identified in its monitoring plan following the schedule in § 109.701(g)(2)(ii) (relating to reporting and recordkeeping).

(II) A system required to conduct quarterly monitoring shall begin monitoring in the first full calendar quarter that includes the compliance date specified in clause (A). A system required to conduct monitoring at frequencies less than quarterly shall begin monitoring in the calendar month recommended in the IDSE report in accordance with 40 CFR 141.601 and 141.602 (relating to standard monitoring; and system specific studies) as incorporated by reference or the calendar month identified in the Subchapter G (relating to system management responsibilities) monitoring plan relating to § 109.701(g)(2)(ii) no later than 12 months after the compliance date under clause (A).

(III) Monitoring shall be conducted at no fewer than the number of locations identified in the table under subclauses (IV) and (V). All systems shall monitor during the month of highest DBP concentrations. Systems on quarterly monitoring shall take dual sample sets every 90 days at each monitoring location, except for community water systems using surface water or GUDI sources serving 500—3,300. Systems on annual monitoring and community water systems using surface water or GUDI sources serving 500—3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. Only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location (and month, if monitored annually).

(IV) Community water systems and nontransient noncommunity water systems using surface water or GUDI sources shall monitor as follows:

Population size	*Monitoring frequencies*	*Distribution system monitoring location total per monitoring period*
< 500	Annually	2
500—3,300	Quarterly	2
3,301—9,999	Quarterly	2
10,000—49,999	Quarterly	4
50,000—249,999	Quarterly	8
250,000—999,999	Quarterly	12
1,000,000—4,999,999	Quarterly	16
≥ 5,000,000	Quarterly	20

(V) Community water systems and nontransient noncommunity water systems using ground water sources shall monitor as follows:

Population size	*Monitoring frequencies*	*Distribution system monitoring location total per monitoring period*
< 500	Annually	2
500—9,999	Annually	2
10,000—99,999	Quarterly	4
100,000—499,999	Quarterly	6
≥ 500,000	Quarterly	8

(VI) An undisinfected system that begins using a disinfectant other than UV light after the dates under 40 CFR 141.600 (relating to general requirements) as incorporated by reference for complying with the IDSE requirements, shall consult with the Department to identify compliance monitoring locations. The system shall develop a monitoring plan under § 109.701(g)(2)(ii) that includes those monitoring locations.

(VII) Systems shall use analytical techniques adopted by the EPA under the Federal act for TTHM and HAA5 analyses. Laboratories that have received accreditation by the Department shall conduct analyses.

(C) *Reduced monitoring.*

(I) Systems may reduce monitoring to the level specified in the table under subclauses (II) and (III) if, after at least 4 consecutive quarters, the LRAA is

equal to or less than 0.040 mg/L for TTHM and equal to or less than 0.030 mg/L for HAA5 at all monitoring locations. Only data collected under subparagraph (i) and this subparagraph may be used to qualify for reduced monitoring. Systems with surface water or GUDI sources shall also take monthly TOC samples every 30 days at a location prior to any treatment, to qualify for reduced monitoring for TTHM and HAA5 under this clause. In addition to meeting other criteria for reduced monitoring in this clause, the source water TOC running annual average (based on the most recent 4 quarters of monitoring) must be equal to or less than 4.0 mg/L on continuing basis at each treatment plant to reduce monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under this clause, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

(II) Community water systems and nontransient noncommunity water systems using surface water or GUDI sources may reduce monitoring as follows:

Population size	*Monitoring frequencies*	*Distribution system monitoring location total per monitoring period*
< 500	Monitoring may not be reduced	
500—3,300	Annually	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with the highest TTHM single measurement, 1 at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
3,301—9,999	Annually	2 dual sample sets: 1 at the location and during the quarter with the highest TTHM single measurement, 1 at the location and during the quarter with the highest HAA5 single measurement.
10,000—49,999	Quarterly	2 dual sample sets at the locations with the highest TTHM and the highest HAA5 LRAAs.
50,000—249,999	Quarterly	4 dual sample sets at the locations with two highest TTHM and two highest HAA5 LRAAs.
250,000—999,999	Quarterly	6 dual sample sets at the locations with the three highest TTHM and the three highest HAA5 LRAAs.
1,000,000—4,999,999	Quarterly	8 dual sample sets at the locations with the 4 highest TTHM and 4 highest HAA5 LRAAs.
≥ 5,000,000	Quarterly	10 dual sample sets at the locations with the five highest TTHM and five highest HAA5 LRAAs.

(III) Community water systems and nontransient noncommunity water systems using groundwater sources may reduce monitoring as follows:

Population size	*Monitoring frequencies*	*Distribution system monitoring location total per monitoring period*
< 500	Every third year	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with the highest TTHM single measurement; 1 at the location and during quarter with highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

Population size	*Monitoring frequencies*	*Distribution system monitoring location total per monitoring period*
500—9,999	Annually	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with highest TTHM single measurement; 1 at the location during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
10,000—99,999	Annually	2 dual sample sets: 1 at the location and during the quarter with the highest TTHM single measurement; 1 at the location and during the quarter with the highest HAA5 single measurement.
100,000—499,999	Quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
≥ 500,000	Quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

(IV) Systems on reduced quarterly monitoring may remain on reduced monitoring as long as the TTHM LRAA is equal to or less than 0.040 mg/L and the HAA5 LRAA is equal to or less than 0.030 mg/L at each monitoring location. Systems on reduced annual or less frequent monitoring may remain on reduced monitoring as long as each TTHM sample result is equal to or less than 0.060 mg/L and each HAA5 sample result is equal to or less than 0.045 mg/L. In addition, the source water TOC running annual average (based on the most recent 4 quarters of monitoring) from samples collected every 90 days at a location prior to any treatment must be equal to or less than 4.0 mg/L at each treatment plant treating surface water or GUDI sources.

(V) If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, is greater than 4.0 mg/L at any treatment plant treating surface water or GUDI sources, the system shall resume routine monitoring under clause (B) or begin increased monitoring if clause (D)(I) applies.

(VI) The Department retains the right to require a system that meets the requirements of this clause to resume routine monitoring.

(D) *Increased monitoring.*

(I) Systems that are required to monitor at a particular location annually or less frequently than annually under clause (B) or (C) shall increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if any single TTHM sample result is greater than 0.080 mg/L or any single HAA5 sample result is greater than 0.060 mg/L at any location.

(II) A system may return to routine monitoring once it has conducted increased monitoring for at least 4 consecutive quarters and the LRAA for every monitoring location is equal to or less than 0.060 mg/L for TTHM and is equal to or less than 0.045 mg/L for HAA5.

(III) Systems on increased monitoring under subparagraph (i) shall remain on increased monitoring until they qualify for a return to routine monitoring under subclause (II). Systems shall conduct increased monitoring under subclause (I) at the monitoring locations in the monitoring plan developed under § 109.701(g)(2)(ii) beginning at the date identified in clause (A) for compliance with this subparagraph and remain on increased monitoring until they qualify for a return to routine monitoring under subclause (II).

(IV) A system may remain on reduced monitoring after the dates identified in clause (A) for compliance with this subparagraph only if it qualified for a 40/30 certification under 40 CFR 141.603 (relating to 40/30 certification) as incorporated by reference or has received a very small system waiver under 40 CFR 141.603 as incorporated by reference, plus meets the reduced monitoring criteria in clause (C), and has not changed or added monitoring locations from those used for compliance monitoring in subparagraph (i). If a system's monitoring locations under this subparagraph differ from monitoring locations under subparagraph (i), the system may not remain on reduced monitoring after the dates identified in clause (A) for compliance with this subparagraph.

(E) *General monitoring and compliance requirements.*

(I) A system required to monitor quarterly shall calculate LRAAs for TTHM and HAA5 using monitoring results collected under this subparagraph and determine that each LRAA does not exceed the MCL. A system that fails to complete 4 consecutive quarters of monitoring, shall calculate compliance with the MCL based on the average of the available

data from the most recent 4 quarters. A system that takes more than one sample per quarter at a monitoring location shall average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

(II) A system required to monitor yearly or less frequently shall determine that each sample result is less than the MCL. If any single sample result exceeds the MCL, the system shall comply with the requirements of clause (D). If no sample result exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

(III) A system required to conduct quarterly monitoring, shall make compliance calculations at the end of the 4th calendar quarter that follows the compliance date and at the end of each subsequent quarter, or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters. A system required to conduct monitoring at a frequency that is less than quarterly shall make compliance calculations beginning with the first compliance sample taken after the compliance date.

(IV) A system is in violation of the MCL when the LRAA at any location exceeds the MCL for TTHM or HAA5, calculated based on 4 consecutive quarters of monitoring, or the LRAA calculated based on fewer than 4 quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters. A system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if it fails to monitor.

(iii) *Clorite.** * *

* * * * *

[(iii)] (iv) *Bromate.* Community water systems and nontransient noncommunity water systems that use ozone for disinfection or oxidation shall monitor for bromate.

* * * * *

(B) *Reduced monitoring.*

(I) [For] Until March 31, 2009, systems that have an average source water bromide concentration that is less than 0.05 mg/L based upon representative monthly bromide measurements for 1 year, the required monitoring is reduced from monthly to quarterly. Systems on reduced monitoring shall continue to take monthly samples for source water bromide. If the running annual average source water bromide concentration, computed quarterly, equals or exceeds 0.05 mg/L based upon representative monthly measurements, the system shall revert to routine monitoring as prescribed by clause (A).

(II) Beginning April 1, 2009, a system required to analyze for bromate may reduce monitoring from monthly to quarterly, if the system's running annual average bromate concentration computed quarterly is less than or equal to 0.0025 mg/L based on monthly measurements as prescribed in clause (A) for the most recent 4 quarters. Systems qualifying for reduced bromate monitoring under subclause (I) may remain on reduced monitoring as long as the running annual average of quarterly bromate samples is less than or equal to 0.0025 mg/L. If the running annual average bromate concentration is greater than 0.0025 mg/L, the system shall resume routine monitoring as prescribed under clause (A).

[(iv)] (v) [Disinfection byproducts] DBP precursors. * * *

* * * * *

Subchapter G. SYSTEM MANAGEMENT RESPONSIBILITIES

§ 109.701. Reporting and recordkeeping.

(a) *Reporting requirements for public water systems.* Public water systems shall comply with the following requirements:

* * * * *

(8) *Reporting requirements for disinfectant residuals.* **[Public] In addition to the reporting requirements specified in paragraph (1), public** water systems shall report MRDL monitoring data as follows:

(i) **[For systems] Systems** monitoring for chlorine dioxide under § 109.301(13) **[:**

(A) The dates, results, and locations of the samples that were taken during the previous month.

(B) Whether the MRDL was exceeded.

(C) Whether the MRDL was exceeded during any 2-consecutive daily samples and whether the resulting violation was acute or nonacute] shall report the number of days chlorine dioxide was used at each entry point during the last month.

(ii) **[For systems] Systems** monitoring for either chlorine or chloramines under § 109.301(13) **[: shall report the arithmetic average of all distribution samples taken in the last month.**

(A) The number of samples taken during each month of the previous quarter.

(B) The monthly arithmetic average of all samples taken in each month for the last 12 months.

(C) The arithmetic average of all monthly averages for the last 12 months.

(D) Whether the MRDL was exceeded.] shall report the arithmetic average of all distribution samples taken in the last month.

(9) **Reporting requirements for disinfection byproducts.**

(i) Systems monitoring for TTHMs and HAA5 under § 109.301(12) shall report the following:

(A) Systems monitoring on a quarterly or more frequent basis shall report the following:

(I) The number of samples taken during the last quarter.

(II) The date, location and result of each sample taken during the last quarter.

(III) The arithmetic average of all samples taken in the last quarter.

(IV) The annual arithmetic average of the quarterly arithmetic averages for the last 4 quarters.

(V) Whether the annual arithmetic average exceeds the MCL for either TTHM or HAA5.

(B) Systems monitoring less than quarterly, but no less than annually shall report the following:

(I) The number of samples taken during the last year.

(II) The date, location and result of each sample taken during the last monitoring period.

(III) The arithmetic average of all samples taken in the last year.

(IV) Whether the annual arithmetic average exceeds the MCL for either TTHM or HAA5.

(C) Systems monitoring less than annually shall report the following:

(I) The date, location and result of the last sample taken.

(II) Whether the sample exceeds the MCL for either TTHM or HAA5.

(ii) Systems monitoring for chlorite under § 109.301(12) shall report the following:

(A) The number of samples taken during the last month.

(B) The date, location and result of each entry point and distribution sample taken during the last month.

(C) The arithmetic average of each three-sample set of distribution samples taken during the last month.

(D) Whether the monthly arithmetic average exceeds the MCL.

(iii) Systems monitoring for bromate under § 109.301(12) shall report the following:

(A) The number of samples taken during the last quarter.

(B) The date, location and result of each sample taken during the last quarter.

(C) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year.

(D) Whether the annual arithmetic average exceeds the MCL.]

[(10)] Reporting requirements for **[disinfection byproducts] DBP precursors. * * ***

* * * * *

(d) *Record maintenance.* The public water supplier shall retain on the premises of the public water system or at a convenient location near the premises the following:

(1) Records of bacteriological analyses **and turbidity analysis** which shall be kept for at least 5 years, and records of chemical analyses which shall be kept for at least 12 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, if the following information is included:

* * * * *

(g) *Monitoring plans for disinfectants,* **[disinfection byproducts] DBPs** *and* **[disinfection byproduct] DBP** *precursors.*

(1) *Stage 1 DBP Rule.* Systems required to monitor for disinfection byproducts **under § 109.301(12)(i)** or disinfection byproduct precursors under § 109.301(12)**(v)** or disinfectant residuals under § 109.301(13) shall develop and implement a monitoring plan. The system shall maintain the plan and make it available for inspection by the Department and the general public no later than 30 days following the applicable compliance dates. All systems that use either surface water or GUDI sources shall submit a copy of the monitoring plan to the Department no later than 30 days prior to the date of the first report required under this subchapter. The Department may also require the plan to be submitted by any other system, regardless of size or source water type. After review, the Department may require changes in any of the plan components.

[(1)] (i) The plan **[shall] must** include the following components:

[(i)] (A) * * *

[(ii)] (B) * * *

[(iii)] (C) * * *

[(iv)] (D) * * *

[(2)] (ii) * * *

(iii) Copies of Stage 1 DBP Rule monitoring plans developed under this paragraph shall be kept for the same period of time as the Stage 1 DBP Rule records of analyses are required to be kept under subsection (d)(1).

(2) *Stage 2 DBP Rule.* Systems required to monitor for disinfection byproducts under § 109.301(12)(ii) shall comply with the following:

(i) *IDSE requirements.* The IDSE requirements established by the EPA under the National Primary Drinking Water Regulations in 40 CFR 141.600—141.605 (relating to initial distribution system evaluations) are incorporated by reference except as otherwise established by this chapter.

(ii) *Stage 2 DPB Rules Compliances monitoring plan.*

(A) A public water system shall develop and implement a monitoring plan to be kept on file for Department and public review. The monitoring plan must contain the elements in subclauses (I)—(IV) and be completed no later than the date systems conduct their initial monitoring under this subpart.

(I) Monitoring locations,

(II) Monitoring dates,

(III) Compliance calculation procedures,

(IV) Monitoring plans for any other systems in the combined distribution system if the Department has reduced monitoring requirements under the Department authority.

(B) Public water systems not required to submit an IDSE report under either 40 CFR 141.601 or 141.602 (relating to standard monitoring; and system specific studies) as incorporated by reference, and do not have sufficient § 109.301(12)(i) monitoring locations to identify the required number of compliance monitoring locations, shall identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The

system shall also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. Systems that have more monitoring locations than required for compliance monitoring shall identify which locations will be used for compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified.

(C) A public water system shall submit a copy of its monitoring plan to the Department prior to the date for initial monitoring specified in § 109.301(12)(ii), unless the system submits to the Department an IDSE report containing all the information required by clause (A).

(D) A public water system may revise its monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for Department-approved reasons, after consultation with the Department regarding the need for changes and the appropriateness of changes. A system that changes monitoring locations, shall replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The Department may also require modifications in the system's monitoring plan. A system using surface water or GUDI sources and serving more than 3,300 people, shall submit a copy of its modified monitoring plan to the Department prior to the date the system is required to comply with the revised monitoring plan.

(iii) ***Operational evaluation levels.***

(A) The operational evaluation level for TTHM and HAA5 is the sum of the two previous quarterly results plus twice the current quarter's result, divided by 4. Each quarter, public water systems shall calculate the TTHM and HAA5 operation evaluation levels for each monitoring location.

(B) If the TTHM operational evaluation level exceeds 0.080 mg/L, or the HAA5 operational evaluation level exceeds 0.060 mg/L at any monitoring location, the system shall conduct an operational evaluation to identify the cause of the exceedence and submit a written report of the evaluation to the Department no later than 90 days after being notified of the analytical result that causes the system to exceed the operational evaluation level. The written report must be made available to the public upon request.

(C) The operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

(I) A system may request and the Department may allow a system to limit the scope of evaluation if the system is able to identify the cause of the operational evaluation level exceedance.

(II) The request to limit the scope of the evaluation does not extend the schedule in subclause (I) for submitting the written report. The Department must approve this limited scope of evaluation in writing and systems shall keep that approval with the completed report.

(iv) ***Reporting and recordkeeping requirements.***

(A) For each monitoring location, public water systems shall report to the Department within 10 days of the end of any quarter in which monitoring is required any TTHM operational evaluation level that exceeded 0.080 mg/L and any HAA5 operational evaluation level that exceeded 0.060 mg/L during the quarter and the location, date, and the TTHM and HAA5 calculated operation evaluation level.

(B) Copies of Stage 2 DBP Rule monitoring plans developed under this subparagraph shall be kept for the same period of time as the Stage 2 DBP Rule records of analyses are required to be kept under subsection (d)(1).

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Subchapter J. BOTTLED WATER AND VENDED WATER SYSTEMS, RETAIL WATER FACILITIES AND BULK WATER HAULING SYSTEMS

§ 109.1003. Monitoring requirements.

(a) *General monitoring requirements.* Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall monitor for compliance with the MCLs and MRDLs in accordance with § 109.301 (relating to general monitoring requirements) and **[shall]** comply with § 109.302 (relating to special monitoring requirements)**, and § 109.1202(relating to monitoring requirements)**. (*Editor's Note*: The Department is proposing to add § 109.1202 at 38 Pa.B. 7035 (December 20, 2008).) The monitoring requirements shall be applied as follows, except that systems which have installed treatment to comply with a primary MCL shall conduct quarterly operational monitoring for the contaminant which the facility is designed to remove:

(1) Bottled water systems, retail water facilities and bulk water hauling systems, for each entry point shall:

* * * * *

(viii) ***TTHM and HAA5 Stage 1 DBP Rule.*** Beginning January 1, 2004, monitor annually for TTHMs and HAA5 if the system uses a chemical disinfectant or oxidant, or obtains finished water from another public water system that uses a chemical disinfectant or oxidant to treat the **[finished]** water. Bottled water systems are not required to monitor for TTHMs and HAA5 if the system does not use a chlorine-based disinfectant or oxidant and does not obtain finished water from another public water system that uses a chlorine-based disinfectant or oxidant to treat the **[finished]** water.

(A) *Routine monitoring.* * * *

(B) *Reduced monitoring.* * * *

(I) Systems that use groundwater sources shall reduce monitoring to **[1] one** sample per 3-year cycle per entry point if the annual TTHM average is no greater **than** 0.040 mg/L and the annual HAA5 average is no greater than 0.030 mg/L for 2 consecutive years or the annual TTHM average is no greater than 0.020 mg/L and the annual HAA5 average is no greater than 0.015 mg/L for 1 year. The sample shall be taken during the month of warmest water temperature. The 3-year cycle shall begin

on January 1 following the quarter in which the system qualifies for reduced monitoring.

(II) Systems that use groundwater sources that qualify for reduced monitoring shall remain on reduced monitoring if the TTHM **annual** average is no greater than 0.060 mg/L and the HAA5 **annual** average is no greater than 0.045 mg/L. Systems that exceed these levels shall resume routine monitoring as prescribed in **clause (A)**, except that systems that exceed either a TTHM or HAA5 MCL shall increase monitoring to at least **[1] one** sample per quarter per entry point beginning in the quarter immediately following the quarter in which the system exceeds the TTHM or HAA5 MCL.

(ix) ***TTHM and HAA5 Stage 2 DBP Rule.*** **Beginning October 1, 2013, monitor annually for TTHMs and HAA5 if the system uses a chemical disinfectant or oxidant to treat the water, or obtains finished water from another public water system that uses a chemical disinfectant or oxidant to treat the water as follows:**

(A) ***Routine monitoring.*** **Systems shall take at least one dual sample set per year per entry point during the month of warmest water temperature.**

(B) ***Increased monitoring.*** **If any sample results exceed either a TTHM or HAA5 MCL, the system shall take at least one dual sample set per quarter per entry point. The system shall return to the sampling frequency of one dual sample set per year per entry point if, after at least 1 year of monitoring, each TTHM sample result is no greater than 0.060 mg/L and each HAA5 sample result is no greater than 0.045 mg/L.**

(x) Beginning January 1, 2004, monitor daily for chlorite if the system uses chlorine dioxide for disinfection or oxidation. Systems shall take at least one daily sample at the entry point. If a daily sample exceeds the chlorite MCL, the system shall take three additional samples within 24 hours from the same lot, batch, machine, carrier vehicle or point of delivery. The chlorite MCL is based on the average of the required daily sample plus any additional samples.

[(x)] (xi) Beginning January 1, 2004, monitor monthly for bromate if the system uses ozone for disinfection or oxidation.

(A) *Routine monitoring.* * * *

(B) *Reduced monitoring.* * * *

(I) [Systems] Until March 31, 2009, systems shall reduce monitoring for bromate from monthly to quarterly if the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for 1 year. Systems on reduced monitoring shall continue monthly source water bromide monitoring. If the running annual average source water bromide concentration, computed quarterly, is equal to or exceeds 0.05 mg/L, the system shall revert to routine monitoring as prescribed by clause (A).

(II) Beginning April 1, 2009, a system required to analyze for bromate may reduce monitoring from monthly to quarterly, if each sample result is less than or equal to 0.0025 mg/L based on monthly measurements as prescribed in clause (A) for the most recent 12 months. Systems qualifying for reduced bromate monitoring under subclause (I) may remain on reduced monitoring as long as each sample result from the previous 12 months is less than or equal to 0.0025 mg/L. If any sample result exceeds 0.0025 mg/L, the system shall resume routine monitoring as prescribed under clause (A).

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