

Notice of Final Rulemaking
Department of Environmental Protection
Environmental Quality Board
(25 Pa. Code, Chapter 109 – Safe Drinking Water)
(Stage 2 Disinfectants and Disinfection Byproducts Rule, Long Term 2 Enhanced Surface Water Treatment Rule, and Groundwater Rule)

Order

The Environmental Quality Board (Board) by this Order amends 25 Pa. Code, Chapter 109 (relating to Safe Drinking Water). The amendments incorporate the provisions of the federal Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBPR), the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) and the Groundwater Rule (GWR) to retain primary enforcement authority (primacy). These revisions were initially proposed in three separate packages that have been merged for clarity and consistency.

The Stage 2 DBPR supplements the Stage 1 DBPR by requiring water systems to meet disinfection byproducts (DBPs) maximum contaminant levels (MCLs) at each monitoring site in the distribution system. These amendments will reduce the potential risks of cancer and reproductive and developmental health effects associated with DBPs by reducing peak levels of DBPs in public drinking water systems.

The LT2ESWTR will further protect public health against *Cryptosporidium* and other microbial pathogens in drinking water. These amendments will supplement existing microbial treatment regulations and target public water systems (PWSs) with higher potential risk from *Cryptosporidium*.

The GWR will provide for increased protection against microbial pathogens in public water systems that use groundwater sources by establishing a risk-targeted approach to identify groundwater sources that are susceptible to fecal contamination using *E. coli* as the indicator organism for source water monitoring. These amendments will build upon the existing Total Coliform Rule by establishing corrective actions, monitoring and source treatment provisions as part of the risk-based strategy.

This order was adopted by the Board at its meeting of _____(date)_____.

A. Effective Date

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

B. Contact Persons

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(717) 787-7060. Persons with a disability may use the AT&T Relay Service by calling 1-800-654-5984 (TDD users) or 1-800-654-5988 (voice users). This final-form rulemaking is available electronically through the DEP Web site (<http://www.dep.state.pa.us>).

C. Statutory Authority

The final-form 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. §§ 510-17 and 510-20).

D. Background and Purpose

Stage 2 DBPR

Since the discovery of total trihalomethanes (TTHM) 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 and/or to cause reproductive or developmental 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 U.S. Environmental Protection Agency (EPA) initiated a rulemaking process to address public health concerns associated with disinfectants, DBPs, and microbial pathogens. The EPA's most significant concern in developing regulations for disinfectants and DBPs was the need to ensure that adequate treatment is 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.

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 established maximum residual disinfectant levels (MRDLs) for chlorine and chlorine dioxide. MCLs were also established for TTHM, five haloacetic acids (HAA5), bromate and chlorite. The Stage 1 DBPR also regulated pre-filtration treatment techniques for public water systems that use conventional filtration to reduce source water Total Organic Carbon (TOC), which may serve as a precursor to DBPs.

The EPA promulgated the federal Stage 2 DBPR on January 4, 2006; minor corrective amendments were published on June 29, 2009. The Stage 2 DBPR augments the Stage 1 DBPR by targeting the highest risk systems for changes beyond those required for Stage 1 DBPR. The Stage 2 DBPR focuses on monitoring for, and reducing concentrations of, TTHM and HAA5. These two groups of DBPs act as indicators for the various byproducts of chemical disinfection. A reduction in TTHM and HAA5 generally indicates an overall reduction of DBPs.

The Stage 2 DBPR will reduce DBP peaks and provide for more consistent, equitable protection from DBPs across the entire distribution system. The Stage 2 DBPR requires PWSs

to identify the higher risk monitoring locations through the Initial Distribution System Evaluation (IDSE) and then lower DBP peaks in distribution systems by making operational or treatment changes as needed to meet the MCLs at all sampling locations. The Stage 2 DBPR changes how MCL compliance is determined. Instead of calculating a system level running annual average based on results from all samples collected in the distribution system, MCL compliance will be determined for *each* sample site as a locational running annual average (LRAA).

The Stage 2 DBPR also defines an operational evaluation level (OEL). The OEL 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 alerts the system to the potential of an MCL violation if DBP concentrations remain at their current level and encourages the system to consider whether operational changes are necessary to reduce DBP levels.

The OEL is the sum of the two previous quarters' TTHM or HAA5 results plus twice the current quarter's TTHM or HAA5 result, divided by four. An OEL exceedance occurs if the OEL for TTHM exceeds 0.080 mg/L or the OEL for HAA5 exceeds 0.060 mg/L at any monitoring location. If an OEL exceedance occurs, 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 OEL exceedance.

LT2ESWTR

The EPA promulgated the federal LT2ESWTR on January 5, 2006. The LT2ESWTR applies to PWSs supplied by surface water or groundwater under the direct influence of surface water (GUDI) sources. Surface water and GUDI sources have been shown to contain *Cryptosporidium* and other pathogens which pose a public health risk. In humans, *Cryptosporidium* may cause a severe gastrointestinal infection, termed *Cryptosporidiosis*, which can last several weeks. *Cryptosporidiosis* poses serious health and mortality risks for sensitive subpopulations including children, the elderly, pregnant women, organ transplant recipients and persons with weakened immune systems.

Cryptosporidium is common in the environment and is targeted by the LT2ESWTR because it 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. Unlike other microbial contaminants, *Cryptosporidium* is resistant to inactivation using standard disinfection practices such as chlorination. The LT2ESWTR increases public health protection from *Cryptosporidium* by establishing a method to identify and adequately treat surface and GUDI sources with elevated levels of *Cryptosporidium*.

PWSs must monitor their source water (the influent water entering the treatment plant) to determine an average *Cryptosporidium* level. Larger systems must monitor for *Cryptosporidium*, *E.coli*, and turbidity at least once per month for 24 consecutive months. Small systems may initially monitor for *E.coli* as an indicator organism and are required to monitor for *Cryptosporidium* only if their *E. coli* levels exceed specified "trigger" values.

Applicable PWSs will be classified in one of four treatment categories (or "bins") based on the results of the source water *Cryptosporidium* monitoring. The higher the *Cryptosporidium* 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. 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 additional 1.0-log to 2.5-logs of treatment for *Cryptosporidium* using at least one of 16 microbial toolbox options. The microbial toolbox provides feasible treatment options specifically targeted at *Cryptosporidium* and establishes design and operational standards for each option. The toolbox options include standards for *Cryptosporidium* inactivation and removal processes.

The EPA believes that implementation of the LT2ESWTR 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.

GWR

The EPA promulgated the federal GWR on November 8, 2006. This final rulemaking will incorporate necessary federal requirements to: (1) establish a risk-targeted approach to identify ground water systems that are susceptible to fecal contamination; (2) define adequate treatment technique requirements for the inactivation and/or removal of viruses; (3) create guidelines including corrective action alternatives for systems to respond in a timely and appropriate manner to significant deficiencies identified by the Department during inspections; and (4) include additional requirements for notifying the public.

Groundwater has been traditionally regarded to be safer than surface water due to the natural filtering that occurs as groundwater travels through aquifer media. New evidence suggests that groundwater may be susceptible to viral contamination despite this natural filtering, particularly in karst aquifers where contaminants are more readily transported through conduits and fissures dissolved in the limestone. Groundwater supplies can become contaminated with fecal pathogens when surface water infiltrates karst aquifers or when high densities of livestock farming operations or on-lot sewage treatment systems overwhelm the natural protective barriers of non-karst aquifers.

The viral pathogens that may be found in groundwater sources with fecal contamination include enteric viruses such as Echovirus, Coxsackie viruses, Hepatitis A and E, Rotavirus, and Noroviruses. Vulnerable groundwater sources have also been found to contain enteric bacterial pathogens such *E. coli*, *Salmonella spp.*, *Shigella spp.*, and *Vibrio cholera*. The Centers for Disease Control reports that between 1991 and 2000, groundwater source contamination and inadequate treatment accounted for 51 percent of all waterborne disease outbreaks in the United States.

Groundwater systems in Pennsylvania were not previously regulated with respect to source water viral contamination. Community groundwater systems were only required to provide continuous disinfection and maintain a detectable disinfectant residual throughout the distribution system. Systems, particularly smaller systems, can potentially satisfy this requirement with entry point disinfectant residuals that are too low to effectively inactivate viruses. Thus, community systems meeting the current disinfection requirement may not be providing the public with adequate protection from viral contamination. Noncommunity groundwater systems are not required to provide disinfection; persons consuming water from these systems are not afforded any protection other than that provided by the characteristics of the source aquifer. The GWR amendments will improve public health protection by ensuring that appropriate corrective actions are taken in response to fecal contamination of source water or the identification of significant deficiencies.

The final-form rulemaking was submitted to the Small Water Systems Technical Assistance Center Advisory Board (TAC) for review and discussion on May 21, 2009. Comments were received from the TAC on June 24, 2009.

E. Summary of Changes to the Proposed Rulemaking

The proposed regulations were published in the Pennsylvania Bulletin separately, as three individual rulemaking packages as follows:

- GWR was published in the Bulletin on November 29, 2008, with a 30-day comment period.
- LT2ESWTR was published in the Bulletin on December 20, 2008, with a 30-day comment period.
- Stage 2 DBPR was published in the Bulletin on December 20, 2008 with a 30-day comment period.

As a result of the notices of proposed rulemaking, the Board received a number of comments from a total of 7 commentators, including EPA and the Independent Regulatory Review Commission. A Comment and Response document have been proposed to address the comments and it is available from the Department. Below is a list of changes that were made to the proposed rulemaking.

§ 109.1 Definitions

BAT -- This definition was amended in response to an EPA comment regarding consistency with the federal BAT requirements found throughout 40 CFR Part 141.

Conventional filtration This definition was amended to correct typographical errors in the proposed rulemaking as it was published.

Wholesale systems -- The word “consecutive” in the definition of wholesale systems was replaced with “public water” to be consistent with the intent of the federal definition and with the definition of consecutive water system in our regulations.

GAC10 and GAC20 -- These definitions were added in response to an EPA comment regarding consistency with federal definitions found in 40 CFR 141.2.

§ 109.202(c)(1)(vi)(D)

This clause was deleted and the text was moved to paragraph 109.202(c)(2).

§ 109.301(8)(vi)

This subparagraph was edited in response to an EPA comment to correct the cross references to sections of the federal regulations that have been vacated.

§ 109.301(12)(i)(B)(I)(-c-)

This subitem was edited in response to an EPA comment to correct the cross reference to disinfection byproduct precursors required monitoring.

§ 109.301(12)(ii)(A)(I)

This subclause was amended to clarify the requirement that any system part of a combined distribution system shall comply at the same time as the system with the earliest compliance date in the combined distribution system.

§ 109.301(12)(ii)(A)(II)

This subclause was amended for consistency. The phrase “consecutive systems” was replaced with “consecutive water systems” to be consistent with the definition in § 109.1.

§ 109.301(12)(ii)(A)(III)

This subclause was added in response to an EPA comment to clarify that the proposed regulation does not clearly specify that Stage 1 MCL requirements are applicable only until the effective dates of the Stage 2 DBP Rule.

§ 109.301(12)(ii)(B)(I)

This subclause was amended in response to an EPA comment to clarify that water systems monitor in accordance with their Stage 2 DBP Rule monitoring plan.

§ 109.301(12)(ii)(B)(II)

This subclause was amended to clarify the cross reference to the Stage 2 DBP Rule monitoring plan.

§ 109.301(12)(ii)(B)(III)

The subclause was revised in response to an EPA comment to be consistent with a correction to the federal monitoring requirements found in 40 CFR 141.621(a)(2) as it was published in the June 29, 2009 Federal Register.

§ 109.301(12)(ii)(D)(IV)

This subclause was amended and moved to § 109.301(12)(ii)(C)(VII) in response to an EPA comment.

§ 109.301(12)(ii)(E)(III) and § 109.301(12)(ii)(E)(IV)

These subclauses were revised to clarify the compliance calculations.

§ 109.304(c)

This subsection was amended in response to an EPA comment to address a missing cross-reference for the LT2ESWTR.

§ 109.408(a)

This subsection was amended for clarity and consistency. A treatment technique violation under the LT2ESWTR requires a Tier 1 public notice because Tier 1 notice is required for any breakdown in treatment necessary to remove acute microbial pathogens. Systems required to install additional treatment to remove *Cryptosporidium* under LT2ESWTR are doing so in response to monitoring that has shown elevated levels of *Cryptosporidium* in the source water. The Department requires Tier 1 PN for those violations or situations with significant potential to

have serious adverse effects on human health as a result of short-term exposure.

Cryptosporidium is an acute pathogen. Therefore, to adequately protect public health and to be consistent with existing regulations, DEP is requiring a Tier 1 PN for this treatment technique violation.

Additionally, for consistency in Chapter organization, paragraphs 7 & 8 were renumbered as paragraphs 10 & 11.

§ 109.505(a)(2)(i)(A-B)

These subclauses were deleted and the text has been added to subsection § 109.505(b).

§ 109.505(b)

This subsection was amended to clarify that noncommunity water systems (NCWS) which have not obtained a construction permit under § 109.503 or an operations permit under § 109.504 and are providing 4-log treatment of viruses under Subchapter M shall obtain a noncommunity water system 4-log treatment of groundwater permit.

§ 109.605

This section was amended to add a missing cross-reference and for Chapter organization. Subsection (3) was amended to add the missing cross-reference for the LT2ESWTR and the existing subsections were renumbered.

Subsection (5) was amended to clarify that a public water system developing a new groundwater source which has tested positive for *E. coli* during new source sampling shall provide 4-log treatment of viruses.

§ 109.701(a)(8)(ii)

This subparagraph was revised to clarify that the reporting requirements for systems monitoring for either chlorine or chloramines under § 109.301(13) include both the number of samples and the arithmetic average of all distribution samples taken in the last month.

§ 109.701(a)(9)

This paragraph was amended to correct a typographical error and in response to an EPA comment. The bracket showing that the text in this paragraph will be deleted was erroneously dropped at printing. This misprint caused EPA's comment that the proposed regulation is not clear as to specifically whether the RAA or LRAA are to be reported and that the proposed regulation does not differentiate how the RAA and LRAA reporting process will change after the Stage 2 effective date.

Under 40 CFR 141.629(a)(3), States have the option to perform calculations and determine compliance for water systems and whether the system is eligible for reduced monitoring. The Department has chosen to calculate LRAA values and determine compliance for water systems in Pennsylvania. Systems are only required to report the results of analyses conducted under § 109.701(a)(1), not the RAA and LRAA calculations. Therefore, paragraph 9 was deleted.

§ 109.701(a)(10)

This paragraph was amended in response to an EPA comment to clarify the reporting requirements for disinfection byproduct precursors. Public water systems are required to only

report analytical results because the Department calculates compliance. Therefore, this paragraph was deleted to be consistent with the reporting requirements for other regulated contaminants.

§ 109.701(d)(1) and (2)

These paragraphs were revised to be consistent with federal recordkeeping requirements under 40 CFR Part 141 and 142.

§ 109.701(g)(2)(ii)(A)

This clause was amended in response to an EPA comment to clarify and correct a cross-reference. The sentence was revised to read “ The monitoring plan must contain the elements in subclauses (I)-(III) and be completed no later than the date systems conduct their initial monitoring under § 109.301(12)(ii)(A).”

§ 109.701(g)(2)(ii)(A)(IV)

This subclause was deleted. Under 40 CR 142.16(m), EPA gives States the option to modify, on a case-by-case basis, the TTHM and HAA5 monitoring requirements for a wholesale and consecutive system that are connected. Water quality may vary greatly between PWSs because of changing water chemistry. Although treatment and operational practices of the wholesaler will affect the water quality in the consecutive system, the consecutive system is responsible for maintaining the quality of the water supplied to their consumers. The Department believes that the monitoring requirements specified in § 109.301(12)(ii) are necessary to ensure acceptable water quality. It is not protective of public health to allow any reduction in monitoring requirements beyond those already covered in § 109.301(12)(ii)(C). Therefore, the Department will not modify the monitoring requirements of a wholesale and consecutive system on a case-by-case basis.

§ 109.701(g)(2)(ii)(B)

This clause was revised in response to an EPA comment to clarify whether the monitoring described are locations under the Stage 1 DBPR or Stage 2 DBPR.

§ 109.701(g)(2)(ii)(D)

This clause was amended to clarify that all systems must submit their modified monitoring plan to the Department. This is consistent with § 109.701(g)(2)(ii)(C) which requires all systems to submit their initial monitoring plan to the Department.

§ 109.701(g)(2)(iii)(A)

This clause was amended to clarify that PWSs on a quarterly monitoring frequency have to calculate an OEL for each sampling location. The OEL is an LRAA threshold, calculated quarterly, that is meant to help systems identify if they are in danger of exceeding the MCL.

§ 109.701(g)(2)(iii)(C)(II)

The subclause was edited in response to an EPA comment to correct a cross reference for the schedule to submit the OEL report after an OEL exceedance.

§ 109.705(b)(1)

The federal Groundwater Rule allows state regulatory agencies to reduce the minimum frequency with which they conduct sanitary surveys at community water systems (CWS) from 3 years to 5 years *if* the State determines the CWS has “outstanding performance”. This federal option was included in the proposed GWR. However, upon further discussion with staff it has been decided that the 3-year minimum frequency for conducting a sanitary survey should not be extended. A 3-year frequency ensures protection of public health and allows greater opportunity for the Department to offer compliance assistance to a CWS. Accordingly, all references to “outstanding performance” and associated incentives have been removed from this final-form rulemaking. This will not place any additional burden on a CWS or Department resources because this is the current minimum frequency for conducting sanitary surveys.

§ 109.705(b)(2)

Text has been deleted which referenced the alternative schedule for states to conduct sanitary surveys at a CWS which has been deleted from the Final Annex A under § 109.705(b)(1).

§ 109.801

This section was amended to address missing cross-references for the Lead and Copper Rule, LT2ESWTR and GWR.

§ 109.810(b)

This subsection was amended because the proposed rulemaking was based on the Chapter 109 language in existence at the time of publication. However, § 109.810(b) was revised as part of the General Update revisions, which were published as final-form rulemaking on May 23, 2009 at 39 Pa. B. 2661. Therefore, these revisions show the proposed changes based on the currently existing language.

§ 109.901(b) and (c)

These subsections were amended to be consistent with federal regulations found in 40 CFR 141.4 regarding the exceptions to obtaining a variance. Variances and exemptions are not permitted for the MCL for total coliforms, nor for the treatment techniques for PWSs using surface water, GUDI or groundwater sources.

§ 109.903(b) and (c)

These subsections were amended to be consistent with federal regulations found in 40 CFR 141.4 regarding the exceptions to obtaining an exemption. Variances and exemptions are not permitted for the MCL for total coliforms, nor for the treatment techniques for PWSs using surface water, GUDI or groundwater sources.

§ 109.1003

This section was amended for clarity and to be consistent with Chapter organization. The cross-reference for LT2ESWTR source water monitoring requirements has been added to subsection (f). Subsection (b) was amended for clarity. The proposed subsection (f) was renumbered as subsection (g).

§ 109.1201(b)

This subsection was amended for clarity and consistency with the requirements of the Stage 2 DBPR. Paragraph (1) was amended for consistency. Paragraph (2) was deleted as unnecessary because subsection (a) already defines the water systems affected by this subchapter.

§ 109.1202(c)

This subsection was amended in response to a public comment to clarify when systems may begin the second round of source water monitoring. The intent is that there is at least a 6-year window between the 2 rounds of source water monitoring. Systems that used grandfathered data or that completed the first round of monitoring early may wish to begin the second round of monitoring before the deadline specified in federal regulations. Therefore, text has been added to clarify when the second round of monitoring may be started.

§ 109.1202(h) -- (p)

Subsection (h) was deleted and moved to Section 109.1205. The grandfathering provisions of the LT2ESWTR are incorporated by reference. To clarify that all of the grandfathering provisions are incorporated by reference, this text was moved to a separate section of Subchapter L.

The remaining subsections were renumbered and cross-references were updated to maintain Chapter organization.

§ 109.1203(e)

Paragraphs 1-4 were amended to clarify that water systems must provide the additional level of treatment specified at all times.

§ 109.1203(n) and (o)

These subsections were amended to clarify that both filtered and unfiltered surface water or GUDI systems must provide the additional treatment required if the bin classification increases as a result of the second round of source water monitoring.

§ 109.1204(b)

This subsection was amended to be consistent with the federal requirements for a watershed control program found in 40 CFR 141.715(b)(1). A watershed control program may not be used as a toolbox option for unfiltered water systems.

§ 109.1205

This section was amended for clarity and Chapter organization. The grandfathering provisions of the LT2ESWTR are incorporated by reference. To clarify that all of the grandfathering provisions are incorporated by reference, this text was moved to a separate section of Subchapter L.

§ 109.1206(e)

This subsection was amended to clarify the reporting requirements for *Cryptosporidium* and *E. coli*.

§ 109.1206(f) -- (l)

This subsection was deleted because the grandfathering provisions are incorporated by reference in section § 109.1205. The remaining subsections were renumbered for Chapter organization.

§ 109.1206(h)

This section was amended to clarify the reporting requirements for systems with Bin 1 sources. Systems with Bin 1 sources that are using alternative treatment technologies for LT2ESWTR have the same toolbox component reporting requirements as systems using Bin 2 or higher sources.

§ 109.1302(a)(2)

This paragraph was amended to clarify the minimum disinfectant residual that must be maintained to demonstrate 4-log inactivation of viruses. The residual of 0.4 mg/L has been changed to 0.40 mg/L because the decimal place is significant when calculating log-inactivation by free chlorine. The calculation used to determine this minimum residual was performed assuming that the design standards set forth in Part II of the Department's *Public Water Supply Manual* (DEP ID# 383-2125-108) are met. The results of the calculation indicate that, in a system satisfying the design requirements, 4-log treatment of viruses is achieved with a minimum residual of 0.40 mg/L. For example, under the proposed regulation, a minimum residual of 0.36 mg/L free chlorine would round to 0.4 mg/L and meet the regulatory requirement but would not provide 4-log inactivation of viruses. This edit to the final regulation corrects that oversight.

This paragraph was also amended in response to a public comment to clarify that the Department will not specify an alternative free chlorine minimum residual, but rather approve an alternative residual. A PWS may propose an alternative residual that provides at least 4-log treatment of viruses. This alternative residual may be either above or below the default residual of 0.40 mg/L.

§ 109.1302(a)(4)

This paragraph has been revised to clarify that 4-log treatment of viruses must be achieved before the first customer, not at the entry point of the distribution system. This provision allows a community water system to utilize the length of transmission line from the entry point to the first customer for log inactivation credit if it is not able to achieve 4-log treatment at the entry point.

§ 109.1302(a)(4)(i-iii)

January dates have been changed to April dates, which allows PWSs an additional three months to comply with the requirement to provide 4-log treatment of viruses. The additional months will also give the Department greater time to review submissions of 4-log demonstrations under § 109.1302(a)(3), which may be necessary in circumstances where the system needs to make physical modifications.

§ 109.1302(a)(6)

This paragraph was amended to clarify that a community water system must provide 4-log treatment for a new source when the source is put into service, not when the entry point is put

into service. This change was made to capture new sources that are developed to serve existing entry points.

§ 109.1302(b)(1)

This paragraph was amended to clarify that a noncommunity water system may utilize the length of transmission line from the entry point to the first customer for log inactivation credit if it is not able to provide 4-log treatment at the entry point.

§ 109.1302(c)(1)(iii)

This subparagraph was amended to clarify that PWSs providing 4-log treatment of viruses must provide adequate treatment prior to the first customer; PWSs shall not be permitted to provide treatment at the first customer. Under existing regulations, Point-of-Use treatment devices are prohibited.

Additionally, this subparagraph was amended to clarify when PWSs that have Department-approved 4-log treatment must begin compliance monitoring.

§ 109.1302(c)(4)

This paragraph was amended for clarity and consistency with federal regulations found in 40 CFR 141.404(a). PWSs must correct any significant deficiency within 120 days or an alternate deadline established by the Department.

§ 109.1303(a)

This subsection was amended to clarify that PWSs must comply with triggered monitoring requirements unless it has successfully demonstrated to the Department that they are capable of providing 4-log treatment of viruses and the Department has approved the submittal. Once the Department approves a system's 4-log treatment submission, compliance monitoring shall commence and triggered monitoring requirements no longer apply.

§ 109.1303(b)

This subsection was amended to clarify the 24-hour time limit for collecting source water samples.

§ 109.1303(c)

This subsection was amended to clarify that a PWS must have a representative sampling plan approved by the Department prior to the notification to begin triggered source water monitoring in order to reduce the number of source water samples required to be collected.

§ 109.1303(c)(1-2)

These paragraphs set forth the conditions under which the Department would permit representative sampling allowing a reduced number of source water samples that must be collected in response to a total coliform-positive result. Paragraph 1 states that systems may reduce the number of source samples to be collected if multiple sources draw from the same hydrogeologic setting. Paragraph 2 states the PWS may sample sources which are representative of Total Coliform Rule monitoring locations in situations where these sources feed separate distribution systems with no interconnection, if a monitoring plan is approved by the Department prior to notification of a total coliform-positive sample collected under § 109.1303(a).

§ 109.1303(f)

This subsection was amended in response to a public comment to be consistent with the federal GWR regulations found in 40 CFR 141.402(a)(5) to allow a PWS to forgo collecting triggered source water samples if the routine total coliform positive sample has been invalidated within the 24 hour time limit under § 109.1303(a). Although the Department has included this provision, it is highly unlikely that a public water system will have a routine total coliform-positive sample invalidated within the 24-hour timeline established under the federal Groundwater Rule.

§ 109.1304(a)

This subsection has been amended in response to a TAC comment. The phrase "...a groundwater system is using a fecally-contaminated groundwater source..." has been changed to "...a groundwater system using a groundwater source with fecal contamination..."

§ 109.1304(a)(1)(i)-(vii)

These subparagraphs were amended to enhance the readability of paragraph (1).

§ 109.1304(a)(1)(iv)

This subparagraph was amended to clarify that triggered source water samples may be used to satisfy the requirements of assessment source water monitoring when approved by the Department.

§ 109.1304(a)(3)

This paragraph was deleted. This was a typographical error in the proposed rulemaking. Provisions relating to invalidation of an *E. coli*-positive sample are covered in § 109.1304(b).

§ 109.1305(a)

This subsection was amended to clarify that the Department will approve, rather than specify, the minimum disinfectant residual necessary to achieve 4-log treatment of viruses.

§ 109.1305(a)(2)(i)

This subparagraph was amended to clarify that grab sampling may be allowed at a location other than the entry point, if approved by the Department.

§ 109.1305(b)

This subsection was amended to remove references to membrane technology. Currently, there are no available integrity testing protocols sensitive enough to locate defects in the membrane that could allow the passage of viruses. Therefore, no log removal credit can be awarded. If integrity testing protocols become available in the future, membrane technology may be used and shall follow requirements established in the current § 109.1305(b).

§ 109.1306(a)

This subsection was amended to clarify that a PWS currently holding a valid operation permit shall submit forms provided by the Department to demonstrate 4-log treatment of viruses.

§ 109.1306(b)

This subsection was created to further explain the responsibilities of a noncommunity water system not operating under a construction and operating permit that is demonstrating and providing 4-log treatment of viruses under subchapter M. A “noncommunity water system 4-log treatment of groundwater permit” has been created for such systems. This is part of a new, abbreviated permitting process specifically designed for noncommunity water systems that choose to, or are required to, provide 4-log treatment of viruses under the GWR.

§ 109.1307(a)(1)(i)

This subparagraph was amended to clarify a compliance monitoring location may either be at the entry point or another Department-approved location.

§ 109.1307(a)(1)(i)(A-C)

These clauses were amended to be consistent with Safe Drinking Water-General Update revisions published as final-form rulemaking on May 23, 2009 at 39 Pa. B. 2661.

F. Benefits, Costs and Compliance

Benefits

The Stage 2 DBPR will reduce DBP peaks and provide for more consistent, equitable protection from DBPs across the entire distribution system. The Stage 2 DBPR will affect approximately 2,045 community water systems and 600 nontransient noncommunity water systems serving 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 Pennsylvania, this translates into a total annual benefit of up to \$144 million in avoiding up to 24 cases of bladder cancer per year.

The LT2ESWTR rule will further protect public health against *Cryptosporidium* and other microbial pathogens in 355 PWSs that supply water to approximately 8.4 million Commonwealth citizens. 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 LT2ESWTR, 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 benefit of LT2ESWTR implementation ranges from \$177 million to \$2.8 billion, depending on the rate of *Cryptosporidium* occurrence. In Pennsylvania, this translates into a total annual benefit of \$4.48 million to \$70.84 million depending on the rate of *Cryptosporidium* occurrence.

The GWR establishes monitoring requirements to ensure adequate treatment is provided at groundwater systems and defines a risk-targeted approach to identify groundwater sources that are vulnerable to fecal contamination. Implementation of the Rule will create public health benefits for approximately 7 million Pennsylvanians resulting from the reduction in endemic acute viral illness and death. Although most illnesses caused by viruses are mild, some viruses may produce severe health effects in children, the elderly, and those with compromised immune systems. The EPA has estimated that the nation may avoid 41,868 illnesses associated with viruses. In Pennsylvania, this translates to 2,553 illnesses avoided. EPA estimated the national annual benefits from the GWR implementation to be \$16 million for community water systems,

\$900,000 for nontransient noncommunity systems and \$2.7 million for transient noncommunity systems. In Pennsylvania, this translates to annual benefits of \$632,657, \$54,548 and \$193,321 respectively, totaling \$880,527.

Compliance Costs

All public water systems in Pennsylvania are affected by at least one of these rules. The costs associated with these three rules will vary because the requirements for each are different and the number of PWSs affected by each rule is different. The annual costs associated with each rule are as follows:

Rule	No. of Systems Affected	Total Annual Costs
Stage 2 DBPR	2,650	\$3,390,000
LT2ESWTR	355	\$3,364,900
GWR	9,100	\$2,929,940
Total		\$9,684,840

For the Stage 2 DBPR, the estimated \$3.39 million includes non-treatment costs of rule implementation such as: the Initial Distribution System Evaluation, Stage 2 DBPR monitoring plans, routine monitoring, reporting, recordkeeping and operational evaluations. PWSs required to install treatment to comply with MCLs will accrue the additional costs of treatment installation as well as operation and maintenance costs.

For the LT2ESWTR, PWSs will incur monitoring costs for turbidity, *E. coli*, and *Cryptosporidium* to assess source water *Cryptosporidium* levels. Estimates of laboratory fees, shipping costs, labor hours for sample collection, and hours for reporting results were used to predict source water monitoring costs. PWSs are required to conduct two rounds of source water monitoring unless the PWS installs additional treatment to achieve the maximum level of treatment required for *Cryptosporidium* as a result of the rule. Some PWSs will be required to install additional treatment based on the results of the source water monitoring.

For the GWR, costs will vary considerably due to the current treatment capacity of a system, groundwater source quality and sensitivity of the groundwater source to fecal contamination. EPA estimates corrective actions systems must take in response to any significant deficiencies identified by the Department or in response to the presence of *E. coli* in raw source water may be the most costly expenses a system may incur. Corrective actions include: installing or upgrading treatment to achieve at least 4-log inactivation and/or removal of viruses; providing an alternate source of water; or eliminating a source of fecal contamination. Systems providing sufficient treatment must conduct compliance monitoring to ensure treatment effectiveness. Additional costs may be borne if a system needs to install equipment to continuously monitor a disinfectant residual.

For this Commonwealth, there are costs associated with regulatory oversight and costs to state-owned public water systems. The details for the Commonwealth costs are as follows:

Rule	Oversight Costs	No. of PWSs Affected	State-owned PWS Costs*	Total Annual Costs
Stage 2 DBPR	\$585,000	32	\$41,000	\$626,000
LT2ESTWR	\$35,420	17	\$161,461	\$196,881
GWR	\$719,469	223	\$70,441	\$789,910
Total	\$1,339,889	-----	\$272,902	\$1,612,791

*The cost estimates for state-owned PWSs are part of (*not* in addition to) the total cost estimates for the regulated community.

Compliance Assistance Plan

Pennsylvania's PENNVEST Program offers financial assistance to public water systems that qualify. Eligibility is based upon factors such as public health impact, compliance necessity, and project/operational affordability. Assistance is in the form of a low-interest loan and in hardship cases additional grant funds may be awarded.

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 program staff, the regulated community or both.

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 Stage 2 DBPR will require that water systems conduct the IDSE and submit the report to the Department. Most of this initial implementation will be completed prior to Department receiving primacy. It is anticipated that little additional paperwork will be necessary for the routine monitoring and reporting upon adoption of this final rulemaking.

The LT2ESWTR amendments will create additional reporting, record keeping and paperwork requirements. It is anticipated that our current data reporting forms can be modified to facilitate any additional monitoring and reporting and that no additional data or paperwork will be necessary.

The GWR will not change existing requirements, but it will add new requirements for groundwater systems. Community water systems will need to complete and submit a form that demonstrates how 4-log treatment will be provided at each entry point and describes how compliance monitoring will be conducted. Systems conducting compliance monitoring because 4-log treatment of viruses is provided will need to use existing Department forms to submit disinfection data on a monthly basis.

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. Pollution Prevention

Not applicable.

H. Sunset Review

The regulations will be reviewed in accordance with the sunset review schedule published by the Department to determine whether the regulation effectively fulfills the goals for which it was intended.

I. Regulatory Review

Under section 5(a) of the Regulatory Review Act (71 P.S. § 745.5(a)), on November 19, 2008, the Department submitted a copy of the notice of proposed rulemaking for the GWR, published 38 *Pa.B.* 6483 (November 29, 2008) and on November 24, 2008, the Department submitted a copy of the notice of proposed rulemaking for the LT2ESWTR and Stage 2 DBP rules, published at 38 *Pa.B.* 7035 (December 20, 2008) and 38 *Pa.B.* 7055 (December 20, 2008), respectively, to the Independent Regulatory Review Commission (IRRC) and the Chairpersons of the House and Senate Environmental Resources and Energy Committees.

Under section 5(c) of the Regulatory Review Act, IRRC and the Committees were provided with copies of the comments received during the public comment period, as well as other documents when requested. In preparing these final-form regulations, the Department has considered all comments from IRRC, the Committees and the public.

Under section 5.1(j.2) of the Regulatory Review Act, on _____ these final-form regulations were deemed approved by the House and Senate Committees. Under section 5.1(e) of the Regulatory Review Act, IRRC met on _____, and approved the final-form regulations.

J. Findings of the Board

The Board finds that

- (1) Public notice of proposed rulemaking was given under sections 201 and 202 of the act of July 31, 1968 (P.L. 769, No. 240) (45 P.S. §§ 1201 and 1202) and regulations promulgated thereunder at *1 Pennsylvania Code* §§ 7.1 and 7.2.
- (2) A public comment period was provided as required by law, and all comments were considered.

(3) These regulations do not enlarge the purpose of the proposals published as follows:

- GWR at 38 Pa. B. 6483 (November 29, 2008);
- LT2ESWTR at 38 Pa.B. 7035 (December 20, 2008); and
- Stage 2 DBPR at 38 Pa.B. 7055 (December 20, 2008).

(4) These regulations are necessary and appropriate for administration and enforcement of the authorizing acts identified in Section C of this order.

K. Order of the Board

The Board, acting under the authorizing statutes, orders that:

(a) The regulations of the Department of Environmental Protection, *25 Pennsylvania Code*, Chapter 109, are amended to read as set forth in Annex A.

(b) The Chairperson of the Board shall submit this order and Annex A to the Office of General Counsel and the Office of Attorney General for review and approval as to legality and form, as required by law.

(c) The Chairperson of the Board shall submit this order and Annex A to the Independent Regulatory Review Commission and the Senate and House Environmental Resources and Energy Committees as required by the Regulatory Review Act.

(d) The Chairperson of the Board shall certify this order and Annex A and deposit them with the Legislative Reference Bureau, as required by law.

(e) This order shall take effect immediately.

BY:

JOHN HANGER
Chairperson
Environmental Quality Board