

**Notice of Proposed Rulemaking
Department of Environmental Protection
Environmental Quality Board
25 Pa. Code, Chapter 109
Safe Drinking Water
(Groundwater Rule)**

Preamble

The Environmental Quality Board (Board) proposes to amend 25 Pa. Code, Chapter 109 (relating to Safe Drinking Water). The amendments will provide for increased protection against microbial pathogens in public water systems that use groundwater sources. The Groundwater Rule establishes a risk-targeted approach to identify groundwater sources that are susceptible to fecal contamination. The Department has chosen *E. coli* as the indicator organism for source water monitoring.

The Groundwater Rule builds upon the existing Total Coliform Rule and establishes corrective actions, monitoring and source treatment provisions as part of the risk-based strategy.

This proposal was adopted by the Board at its meeting of _____.

A. Effective Date

These amendments will go into effect upon publication in the *Pennsylvania Bulletin* as final 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. Information regarding submitting comments on this proposal appears in Section J of this preamble. 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). The proposal is available electronically through the DEP Web site (<http://www.dep.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

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 fecally contaminated 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 fecally contaminated groundwater sources 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 are not currently regulated with respect to source water viral contamination. The present regulations require only that community groundwater systems provide continuous disinfection that is detectable 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.

This proposed rulemaking package will amend the Department's Safe Drinking Water regulations 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.

Minor clarifications are being made to the variance and exemption requirements in Subchapter I of Chapter 109 to be consistent with the federal rule and as a condition of primacy.

The draft proposed amendments were submitted to the Small Water Systems Technical Assistance Center Advisory Board (TAC) for review and discussion on December 13, 2007. The TAC Board commented regarding the recordkeeping requirements stating, "The extensive recordkeeping requirements are unrealistic for small systems." The TAC Board suggested that

the Department keep and maintain these records and automatically send them to the owner whenever a system changes ownership.

The recordkeeping requirements contained in 109.1307(b) are consistent with the federal requirements, five or ten years for most categories, and these have been long-standing requirements. Further, it should be noted that Pennsylvania must be at least as stringent as the corresponding EPA requirements. In addition, the Department historically has provided authorized representatives with system-specific records upon request, and would continue to do so.

E. Summary of Regulatory Requirements

§ 109.1 Definitions.

The Department has added definitions for the following terms in § 109.1: *groundwater*, *log inactivation*, *log removal*, *log treatment* and *microorganism*. These terms are vital to the clear interpretation of the Groundwater Rule and had not been previously defined in Chapter 109.

§ 109.408 Tier 1 public notice – form, manner and frequency of notice.

Section § 109.408 (a)(8) is added to require Tier 1 public notice for a positive *E. coli* source water sample for systems monitoring under the triggered monitoring requirements (§ 109.1303) and the assessment source water monitoring requirements (§ 109.1304).

Section § 109.408(a)(9) is added to clarify that, for systems conducting compliance monitoring, a breakdown in treatment requires Tier 1 public notification.

§ 109.408 Tier 2 public notice – form, manner and frequency of notice.

Section § 109.409(a)(1) is amended to include the requirement of Tier 2 public notification for a failure to take corrective action as required 40 CFR § 141.203(a)(4).

§ 109.417 Special notice for significant deficiencies by noncommunity water systems.

This amendment reflects the federal requirements found in 40 CFR § 141.403(a)(7)(ii). In addition to other public notification obligations, a noncommunity system is required to provide special notice to the public for significant deficiencies that have not been corrected within 12 months of being notified by the Department.

§ 109.503 Public water system construction permits.

This section was amended to clarify the monitoring requirements by specifying *E. coli* as the fecal indicator for new source sampling.

§ 109.505 *Requirements for noncommunity water systems.*

To account for new treatment technique requirements, as specified in Subchapter M, this section was amended to clarify the conditions under which noncommunity systems may file a brief description of the system in lieu of obtaining a permit. Prior to the Groundwater Rule, noncommunity water systems were not required to obtain construction and operation permits if they provided treatment no greater than disinfection. The Department has modified this exception. These permits will be required for noncommunity systems providing only disinfection if they are required to meet 4-log treatment of viruses under § 109.1302. The demonstration of 4-log treatment requires an engineering determination that must be reviewed as part of a permitting process.

This section was also amended to clarify the monitoring requirements by specifying *E. coli* as the fecal indicator for new source sampling for transient noncommunity systems.

§ 109.605 *Minimum treatment design standards.*

§ 109.605(3) was added to define minimum treatment design standards for new facilities is at least 99.99% (4-log) treatment of viruses.

§ 109.705 *Sanitary surveys.*

This section was amended to revise the frequency of sanitary surveys conducted by the Department to be consistent with the federal requirements found in 40 CFR § 142.16(o)(2).

§ 109.901 *Requirements for a variance.*

This section was amended to incorporate the federal requirements found in 40 CFR § 142.10(d)(2).

§ 109.903 *Requirements for an exemption.*

This section was amended to incorporate the federal requirements found in 40 CFR §§ 141.4(a) and 142.20(b).

§ 109.906 *Consideration of a request for a variance or exemption.*

This section was amended to incorporate the federal requirements found in 40 CFR § 142.20(b)(1)(ii).

§ 109.907 *Disposition of a request for a variance or exemption.*

This section was amended to incorporate the federal requirements found in 40 CFR §§ 142.20(a)(1) and 142.20(b)(1).

§ 109.908 *Compliance schedules.*

This section was amended to incorporate the federal requirements found in 40 CFR §§ 142.20(a)(2) and 142.20(b)(2).

§ 109.1002 *MCLs, MRDLs or treatment techniques.*

This section was amended to clarify that bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with Subchapter M.

§ 109.1003 *Monitoring requirements.*

This section was amended to clarify that bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with the monitoring requirements of Subchapter M.

Subchapter M. *Additional requirements for groundwater sources.*

This subchapter was added to reflect the Federal Requirements in 40 CFR Subpart S and to further clarify requirements for systems using groundwater sources in Pennsylvania. The following is a brief summary of each section including descriptions of where the proposed state requirements are more stringent than Federal regulations.

§ 109.1301 *Scope.*

This section clarifies that systems using groundwater not combined with surface water or groundwater under the direct influence of surface water prior to treatment are required to comply with the provisions of Subchapter M.

§ 109.1302 *Treatment technique requirements.*

This section establishes the treatment technique requirements for community and noncommunity systems and includes corrective action alternatives for systems with significant deficiencies or source water *E. coli* contamination.

§ 109.1302(a)(4) requires all community water systems with groundwater sources to reliably achieve at least 4-log treatment of viruses for those sources. This component of the proposed rulemaking is more stringent than the current Federal Requirements found in 40 CFR § 141.403(b).

Under § 109.202(c)(2), existing requirements for community systems in Pennsylvania are already more stringent than Federal regulations. Unlike the Federal requirements, Pennsylvania mandates that all community water systems provide continuous disinfection. The current state regulations do not, however, require groundwater systems to maintain any minimum measure of disinfectant level or effectiveness at the entry point. The Pennsylvania Groundwater Rule requirement that all community systems maintain at least 4-log treatment of viruses for their

groundwater sources is a logical progression of disinfection treatment and will provide additional protection of public health. Most systems are presently capable of providing 4-log treatment of viruses without significant modification. For the remaining systems, this requirement will likely be satisfied by one or more of the following: revising system-specific operational practices, modifying existing storage, or adding storage capacity.

This requirement will be phased in based on population served, and is planned to occur in the period from January 1, 2011 to January 1, 2013. All public groundwater systems will need to comply with triggered monitoring requirements from December 1, 2009 until they receive DEP notification that they are demonstrating at least 4-log treatment and then are directed to begin compliance monitoring.

§ 109.1302(a)(2) establishes a default entry point free chlorine minimum residual of 0.4mg/L or its equivalent for all community systems. Community water systems must maintain the default minimum residual until they successfully demonstrate that an alternative residual can provide at least 4-log treatment of viruses. The default residual is being required to better protect public health during the interim period between the effective date of this rule and the date when the Department has verified that a community groundwater system is providing 4-log treatment of viruses.

The default residual of 0.4mg/L was determined using the accepted calculation for CT. Based on conservative assumptions of groundwater characteristics in Pennsylvania (temperature no less than 5°C and pH less than 9), a CT value of 8 min-mg/L is required to achieve 4-log inactivation of viruses. Further, existing Design Standards in Part II of the Department's "Public Water Supply Manual" require that 20 minutes of contact time with minimal short circuiting be provided prior to each entry point. Assuming the Design Standards are met, a minimum residual of 0.4mg/L multiplied by 20 minutes contact time results in the required CT value of 8 min-mg/L.

Most systems can readily maintain a 0.4mg/L minimum residual prior to each entry point simply by adjusting their level of disinfectant application. Currently ninety-three percent of community water systems disinfect with chlorine. Of these systems, at least sixty percent presently maintain an average residual of 0.4mg/L or greater in the distribution system (based on available compliance data). Because entry point disinfectant residuals are greater than levels in the distribution system, it is expected that the percentage of systems presently maintaining at least 0.4mg/L at the entry point is much higher than sixty percent.

§ 109.1303 *Triggered monitoring requirements for groundwater sources.*

This section establishes source water monitoring requirements for systems that have not received confirmation from the Department that they are providing at least 4-log treatment of viruses and thus are not conducting compliance monitoring. In response to a coliform-positive sample collected under 40 CFR § 141.21(a), the Groundwater Rule requires these systems to collect additional groundwater source samples to be analyzed for the presence of *E. coli*.

The Department will require source samples to be collected prior to any treatment, whereas a sampling location is not specified in 40 CFR § 141.402(a). To eliminate the possibility of source water pathogens being inactivated or removed (thus rendering a sample non-representative of source water quality) the Department will not approve source water sampling locations downstream of any treatment.

The Federal rule, 40 CFR § 141.402(a)(2), requires source water samples be collected from “each ground water source in use at the time” the routine total coliform-positive sample was collected. The Department clarifies this requirement by specifying that samples should be collected from each source connected to the distribution system where the total coliform-positive sample was collected. The revised language eliminates confusion regarding which source or sources may have been in use at the time of the positive sample by instead focusing on a source’s potential of contributing to the distribution contamination. Prior to sampling, systems may still obtain written approval under § 109.1303(c) to collect samples from representative sources.

In response to any total coliform-positive routine sample that is not invalidated, systems will be required to collect source water samples in accordance with § 109.1303(a). The federal rule, 40 CFR § 141.402(a)(5), allows states the ability to determine if a distribution deficiency or condition caused the total coliform-positive routine sample and, thereby, relieve systems from their obligation to conduct triggered source water monitoring. For systems conducting routine coliform monitoring as prescribed in § 109.301(3), the Department does not believe it is possible to eliminate source water quality as a potential contributor to the distribution contamination without additional sample results.

Under the federal rule, 40 CFR § 141.402(a)(2)(iii), a groundwater system serving less than 1000 people (and thus required to collect four check samples in response to a routine total coliform positive sample) may also use a source water sample collected to satisfy the triggered monitoring requirements under § 109.1303 as one of the repeat samples under the Total Coliform Rule (TCR). This sample substitution is not permitted in Pennsylvania’s Groundwater Rule. The Department believes that source water samples are not representative of the distribution system and, therefore, should not be used in any analyses designed to draw inferences about distribution system water quality.

§ 109.1304 *Assessment source water monitoring.*

Under the federal rule, 40 CFR § 141.402(b), assessment source water monitoring is an option for a state to implement. The Department has chosen to adopt assessment source water monitoring to target higher-risk groundwater sources for additional source water monitoring and evaluation. This provision will only apply to non-community water systems considering that all community water systems will eventually be required to provide at least 4-log treatment of viruses. In Pennsylvania, systems that draw groundwater from a carbonate aquifer (i.e. – limestone) are considered susceptible to fecal contamination and therefore must conduct assessment source water monitoring as directed by the Department or install a treatment technology that achieves a minimum 4-log inactivation or removal of viruses. Groundwater sources not developed in carbonate aquifers may also be considered sensitive and targeted for assessment source water monitoring. The Department will consider other factors that identify

sources at risk to fecal contamination such as: sensitivity of the source aquifer to fecal contamination, proximity to sources of fecal contamination or microbiological sampling history.

The Federal rule, 40 CFR § 141.402(b)(5), allows a State to approve collection of groundwater source samples for assessment source water monitoring at a location after treatment. To eliminate the possibility of source water pathogens being inactivated or removed (thus rendering a sample non-representative of source water quality) the Department will not approve source water sampling locations downstream of any treatment. Prior to sampling, systems may still obtain written approval under § 109.1304(a)(1) to collect samples from representative sources.

§ 109.1305 *Compliance monitoring.*

This section establishes the monitoring requirements for systems that have demonstrated to the Department that they provide at least 4-log treatment of viruses for their groundwater sources. Upon notification from the Department, a system must begin compliance monitoring to ensure treatment efficacy. Systems conducting compliance monitoring are not subject to the requirements of either triggered monitoring or assessment source water monitoring. This section reflects the federal requirements found in 40 CFR § 141.403(b).

§ 109.1306 *Information describing 4-log treatment and compliance monitoring.*

This section establishes requirements for systems electing to or obligated to provide at least 4-log treatment of viruses. This section states that systems must submit information on forms provided by the Department describing how at least 4-log treatment of viruses is provided. If an engineer's report is required it must be prepared by or under the supervision of a professional engineer registered to practice in Pennsylvania.

In addition to demonstrating that at least 4-log treatment of viruses will be provided, systems must describe how they will satisfy the compliance monitoring provisions in § 109.1305.

§ 109.1307 *System management responsibilities.*

This section establishes the reporting and recordkeeping obligations for systems subject to the provisions of Chapter 109 Subchapter M. The requirements of this section reflect the provisions in 40 CFR § 141.405.

For systems conducting compliance monitoring, § 109.1307 (a)(1)(ii) requires Tier 1 public notice when a breakdown in treatment occurs for greater than 4 hours, whereas 40 CFR § 141.404(c) and (d) mandates Tier 2 public notice. This addition is consistent with Pennsylvania's existing public notification regulations in § 109.408 that necessitates Tier 1 public notice for a failure or significant interruption in key water treatment processes.

F. Benefits, Costs and Compliance

Benefits

The Groundwater Rule 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 from two groups of viruses. Type A virus, represented by rotavirus, is highly infectious, but generally creates mild health effects. Type B virus, represented by enterovirus, is moderately infectious. Although most illnesses caused by type-B viruses are also mild, may produce severe health effects in children, the elderly, and those with compromised immune systems.

The EPA has estimated that the nation may avoid 39,442 illnesses associated with Type A rotavirus, and 2,426 illnesses related to Type B enterovirus. In Pennsylvania, this translates to 2,405 and 148 illnesses avoided respectively.

The EPA has quantified the mean annual cost of illness occurring as a result of viruses in public water supply wells under normal operating conditions. EPA estimated the national annual benefits from Rule implementation to be \$16 million for community water systems, \$0.9 million for nontransient noncommunity systems and \$2.7 million for transient noncommunity systems. Resulting from illnesses avoided in Pennsylvania this translates to annual benefits of \$632,657, \$54,548 and \$193,321 respectively, totaling \$880,527.

The proposed variance and exemption revisions will ensure that public water systems consider all other options for achieving compliance prior to requesting a variance or exemption from an MCL or treatment technique requirement.

Compliance Costs

The EPA estimated the annual cost to implement the Groundwater Rule for public water systems nationwide will be approximately \$50 million. It is anticipated that Pennsylvania's public water systems will incur a cost of \$2.9 million annually. The yearly cost for each type of public water systems is projected to be the following:

System Type	Estimated Annual Cost
Community Water System	\$738,627
Transient Noncommunity Water System	\$1,893,114
Nontransient Noncommunity Water System	\$298,198

Nationwide, the annual cost states will bear are expected to be \$11.8 million as calculated by the EPA. The Groundwater Rule is expected to cost the Pennsylvania state government \$719,469 yearly.

The proposed minor clarifications to Subchapter I, variances and exemptions, primarily address existing requirements. As a result, costs are not expected to substantially increase or decrease.

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 will provide training to systems identified to be effected by the Groundwater Rule. To facilitate system compliance, the Bureau of Water Standards and Facility Regulation will send informational documents to groundwater systems prior to the effective date of the regulation to clarify the various provisions of the Rule.

Paperwork Requirements

Systems providing at least 4-log treatment of viruses must submit forms to the Department successfully demonstrating treatment effectiveness in order to commence conducting compliance monitoring. As a one time cost, systems may prefer to employ a professional engineer to complete any applicable forms or reports.

The requirements of the Groundwater Rule include additional monitoring, recording and reporting. It is anticipated these obligations will require little or no additional paperwork.

G. Pollution Prevention

Not applicable.

H. Sunset Review

This regulation 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 _____ 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. 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 Regulatory Review Act, IRRC may convey any comments, recommendations or objections to the proposed regulations 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 Department, the General Assembly and the Governor prior to final publication of the regulations.

J. 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 _____ (within 30 days of publication in the *Pennsylvania Bulletin*). 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 _____ (within 30 days of publication in the *Pennsylvania Bulletin*). 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 _____. 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 two working days, the comments should be retransmitted to ensure receipt.

BY:

JOSEPH R. POWERS
Acting Chairman
Environmental Quality Board