

<h1>Regulatory Analysis Form</h1> <p>(Completed by Promulgating Agency)</p> <p>(All Comments submitted on this regulation will appear on IRRC's website)</p>		<p>INDEPENDENT REGULATORY REVIEW COMMISSION</p>			
<p>(1) Agency Department of Environmental Protection</p>		<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> RECEIVED IRRC 2018 JAN 22 P 4: 28 </p>			
<p>(2) Agency Number: Identification Number: 7-520</p>				<p>IRRC Number: 3136</p>	
<p>(3) PA Code Cite: 25 Pa. Code, Chapter 109</p>					
<p>(4) Short Title: Disinfection Requirements Rule</p>					
<p>(5) Agency Contacts (List Telephone Number and Email Address): Primary Contact: Laura Edinger, 717.783.8727, ledinger@pa.gov Secondary Contact: Jessica Shirley, 717.783.8727, jessshirley@pa.gov</p>					
<p>(6) Type of Rulemaking (check applicable box):</p> <p><input type="checkbox"/> Proposed Regulation</p> <p><input checked="" type="checkbox"/> Final Regulation</p> <p><input type="checkbox"/> Final Omitted Regulation</p>		<p><input type="checkbox"/> Emergency Certification Regulation;</p> <p><input type="checkbox"/> Certification by the Governor</p> <p><input type="checkbox"/> Certification by the Attorney General</p>			
<p>(7) Briefly explain the regulation in clear and nontechnical language. (100 words or less)</p> <p>The purpose of the Disinfection Requirements Rule is to strengthen public water system (PWS) requirements relating to microbial protection and disinfection requirements. The amendments also include minor clarifications to the Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2 DBPR), the Long Term 2 (LT2) Enhanced Surface Water Treatment Rule, and the Lead and Copper Rule Short-Term Revisions (LCRSTR) in order to obtain or maintain primacy.</p> <p>The amendments will protect public health through a multi-barrier approach designed to guard against microbial contamination by ensuring both the adequacy of treatment designed to inactivate microbial pathogens and the integrity of the distribution system. Safe drinking water is vital to maintaining healthy and sustainable communities.</p>					
<p>(8) State the statutory authority for the regulation. Include <u>specific</u> statutory citation.</p> <p>Section 4(a) of the Pennsylvania Safe Drinking Water Act, 35 P.S. § 721.4(a), and section 1920-A of the Administrative Code of 1929, 71 P.S. § 510-20(b).</p>					

(9) Is the regulation mandated by any federal or state law or court order, or federal regulation? Are there any relevant state or federal court decisions? If yes, cite the specific law, case or regulation as well as, any deadlines for action.

Yes, for the Stage 2 DBPR, LT2, and LCRSTR components.

Section 1413 of the Federal Safe Drinking Water Act, 42 U.S.C. § 300g-2a, requires that, in order for the state to retain primary enforcement authority (primacy), the state must adopt drinking water regulations that are “no less stringent than” the national primary drinking water regulations not later than 2 years after the date on which the regulations are promulgated by the United States Environmental Protection Agency (EPA), or must ask EPA for an extension of up to 2 years. The federal drinking water primacy regulations at 40 CFR § 142.12(a) also require the state to adopt all new and revised national primary drinking water regulations contained in 40 CFR Part 141 in order to retain primary enforcement responsibility. Furthermore, Section 4(a) of the Pennsylvania Safe Drinking Water Act, 35 P.S. § 721.4(a), requires the Environmental Quality Board to adopt maximum contaminant levels and treatment technique requirements no less stringent than those promulgated under the Federal act for all contaminants regulated under the national primary and secondary drinking water regulations. Also, Section 5(a) of the state act, 35 P.S. § 721.5(a), requires the Department to adopt and implement a public water supply program which includes those program elements necessary to assume state primary enforcement responsibility under the Federal act.

EPA promulgated the Federal Stage 2 DBPR on January 4, 2006, the Federal LT2 on January 5, 2006, and the Federal LCRSTR on October 10, 2007. Pennsylvania adopted state regulations implementing the Federal rules on December 26, 2009 (Stage 2 DBPR and LT2) and December 18, 2010 (LCRSTR). Minor clarifications are included in this proposed rulemaking, as required by EPA, in order to obtain or maintain primacy for these rules.

Regarding the disinfection requirements, the federal rule mandates CT/log inactivation requirements (CT is the product of residual disinfectant concentration (C) and disinfectant contact time (T)) for surface water and Groundwater Under Direct Influence (of surface water) (GUDI) systems and the maintenance of a detectable disinfectant residual. However, EPA does not define “detectable” residual and leaves the decision to the states. The Department’s previous residual of 0.02 mg/L did not represent an achievable detectable residual and was therefore not a viable or enforceable drinking water standard.

(10) State why the regulation is needed. Explain the compelling public interest that justifies the regulation. Describe who will benefit from the regulation. Quantify the benefits as completely as possible and approximate the number of people who will benefit.

Calculations to Demonstrate 1.0 log Giardia and 3.0 log Virus Inactivation:

Existing regulations require filter plants to maintain 90% (1-log) inactivation of Giardia cysts and 99.9% (3-log) inactivation of viruses by way of disinfection. When these levels are not achieved, customers may be exposed to pathogenic Giardia cysts and viruses. The only way to determine compliance with this requirement is to perform log inactivation calculations, which is not required by current regulation.

The final-form rulemaking will require all 353 filter plants (which are operated by 319 water systems) to calculate their log inactivation at least once per day and report to the Department the lowest level achieved each day. This provision will provide a mechanism for the PWSs and the Department to determine compliance with the existing log inactivation requirements.

The amendments to the surface water treatment regulations will benefit more than 8 million Pennsylvanians that are supplied water by PWSs utilizing filtration technologies.

Disinfectant Residuals in the Distribution System:

The amendments are intended to strengthen the distribution system disinfectant residual requirements by increasing the minimum residual in the distribution system to 0.2 mg/L free or total chlorine. The Department's previous disinfectant residual requirements for the distribution system had not been substantially updated since 1992 and required the maintenance of a detectable residual that is defined as 0.02 mg/L. The Department's previous treatment technique is not protective of public health because a residual of 0.02 mg/L does not represent an achievable detectable residual using current analytical methods and most likely represents a false positive reading.

Maintenance of a disinfectant residual in the distribution system is:

- Required under the federal Surface Water Treatment Rule for all systems using surface water and GUDI sources and under Chapter 109 for all community water systems and those noncommunity water systems that have installed disinfection.
- Designated by EPA as the best available technology (BAT) for compliance with both the Total Coliform Rule and the Revised Total Coliform Rule.
- Considered an important element in a multiple barrier strategy aimed at maintaining the integrity of the distribution system and protecting public health.
- Intended to maintain the integrity of the distribution system by inactivating microorganisms in the distribution system, indicating distribution system upset, and controlling biofilm growth.

As distribution systems age, deterioration can occur due to corrosion, erosion of pipe materials, and external pressures that can lead to breaches in pipes and storage facilities, intrusion, and main breaks. In recent years, deteriorating water infrastructure in many parts of the U.S. has resulted in frequent water main breaks and other situations that can pose intermittent or persistent health risks. Many of these deficiencies create pathways of contamination. Therefore, ensuring the integrity and effective operation of distribution systems is critical for public health protection.

Factors that influence pathogen survival and growth in the distribution system include water chemistry (temperature, pH, etc.), presence of nutrients, system hydraulics, sediment accumulation, and presence (or absence) of disinfectant residual. Of these factors, maintenance of an adequate disinfectant residual throughout the distribution system plays a key role in controlling the growth of pathogens and biofilms and is a treatment technique that serves as one of the final barriers to protect public health.

Based on a review of available studies, reports and data, a regulatory minimum of 0.2 mg/L (free or total chlorine) in the distribution system is necessary to ensure an achievable detectable (and enforceable) residual based on current analytical methods.

This provision will affect and improve public health protection for all 1,949 community water systems (CWS) and 746 noncommunity water systems (NCWS) that have installed disinfection. These 2,695 PWSs serve a total population of 11.3 million people.

(11) Are there any provisions that are more stringent than federal standards? If yes, identify the specific provisions and the compelling Pennsylvania interest that demands stronger regulations.

The following amendments are more stringent than federal requirements. These amendments are intended to better protect public health and to be consistent with existing Pennsylvania drinking water regulations.

- Section 109.202(c)(1)(ii)(B) clarifies the minimum residual disinfectant level at the entry point by adding a zero to the minimum level (0.20 mg/L). This ensures that water suppliers maintain a residual that is equal to or greater than 0.20 mg/L. Currently, levels of 0.15 or higher round up to 0.2 and are in compliance. A level of 0.20 mg/L is necessary due to the importance of meeting CTs and maintaining an adequate disinfectant residual in the water entering the distribution system. Also, this level of sensitivity is consistent with existing requirements for the Groundwater Rule (0.40 mg/L) as specified in § 109.1302(a)(2). Under 40 CFR 141.72(b)(2), the federal rule requires a minimum level of 0.2 mg/L.
- Sections 109.202(c)(6) & (7); 109.301(1)(i)(E), (2)(i)(F) & (13); and 109.710(c) & (d) require compliance with the minimum disinfectant residual level of 0.2 mg/L in the distribution system and strengthens monitoring and reporting requirements to protect public health and ensure equitable water quality for all consumers. Additional justification for these amendments may be found in the response to Question 10. Under 40 CFR 141.72(b)(3), the federal rule requires a “detectable” residual. EPA did not define “detectable” and left the decision to the states.
- Section 109.202(c)(1)(ii)(A) requires filter plants to maintain 90% (1-log) inactivation of Giardia cysts and 99.9% (3-log) inactivation of viruses using disinfection. When these levels are not achieved, consumers may be exposed to pathogenic Giardia cysts and viruses. The only way to determine compliance with this requirement is to perform log inactivation calculations. Sections 109.301(1)(v) & (vi) and 109.701(a)(2)(i)(C) & (D) were added to require monitoring and reporting of CT calculations to the Department.
- Section 109.710(e) requires one-hour notification to the Department for certain violations related to the disinfectant residual requirements. One-hour reporting is an existing requirement under § 109.701(a)(3) and ensures that the Department and the public are alerted to potential problems as soon as possible so that appropriate investigative and corrective actions can be taken. The federal rule generally requires self-reporting of violations to the state within 24 – 48 hours.
- Section 109.716 was added to require a water system that uses chloramines as a disinfection process to develop and implement a nitrification control plan. This plan is in lieu of requiring a higher residual for systems that chloramine in order to provide simultaneous control of microbes and nitrification.

(12) How does this regulation compare with those of the other states? How will this affect Pennsylvania’s ability to compete with other states?

Calculations to Demonstrate 1.0 log Giardia and 3.0 log Virus Inactivation:

At least fifteen other states require log inactivation to be calculated, recorded and reported on plant Monthly Operating Reports (MORs).

Disinfectant Residuals in the Distribution System:

The Department’s previous disinfectant residual requirements, while consistent with the federal rule, had not kept pace with other states. At least 23 states have promulgated more stringent requirements when

compared to the Department's previous standard of 0.02 mg/L. And 19 states have disinfectant residual requirements that are ≥ 0.2 mg/L. These amendments will make Pennsylvania more consistent with these other states regarding public health protection.

State	Minimum Distribution System Residual (mg/L)	Allows HPC as ACC
Alabama*	0.2 (free), 0.5 (total)	No
Colorado*	0.2 (free or total)	Yes
Delaware	0.3 (free)	No
Florida*	0.2 (free), 0.6 (total)	No
Georgia	0.2 (free)	Yes
Illinois*	0.2 (free), 0.5 (total)	No
Indiana	0.2 (free), 0.5 (total)	No
Iowa	0.3 (free), 1.5 (total)	Yes
Kansas*	0.2 (free), 1.0 (total)	No
Kentucky*	0.2 (free), 0.5 (total)	No
Louisiana*	0.5 (free or total)	No
Minnesota	0.1 (free or total)	No
Missouri	0.2 (total)	Yes
Nebraska	SW-0.2 (free), 0.25 or 0.5 (total); GW-0.1 (free)	Yes
Nevada	0.05 (free or total)	No
New Jersey*	0.05 (free or total)	Yes
North Carolina*	0.2 (free), 1.0 (total)	Yes
Ohio*	0.2 (free), 1.0 (total)	No
Oklahoma	0.2 (free), 1.0 (total)	No
Tennessee*	0.2 (free)	No
Texas*	0.2 (free), 0.5 (total)	No
Vermont	0.1 (free)	No
West Virginia*	0.2 (total)	No

* States with mandatory disinfection

The amendments will not put Pennsylvania at a competitive disadvantage with any other state. Rather, the amendments will enhance Pennsylvania's ability to compete with other states by improving public confidence in Pennsylvania's drinking water by increasing actual health protections and promoting healthy and sustainable communities.

(13) Will the regulation affect any other regulations of the promulgating agency or other state agencies? If yes, explain and provide specific citations.

The amendments will be incorporated into the existing language of 25 Pa Code Chapter 109. Other than this incorporation, the amendments should not affect any existing or proposed regulations of DEP or any other state agency.

(14) Describe the communications with and solicitation of input from the public, any advisory council/group, small businesses and groups representing small businesses in the development and drafting of the regulation. List the specific persons and/or groups who were involved. (“Small business” is defined in Section 3 of the Regulatory Review Act, Act 76 of 2012.)

The pre-draft proposed rulemaking was originally included in the Pre-Draft Proposed Revised Total Coliform Rule (RTCR), which was presented to the Small Water Systems Technical Assistance Center (TAC) Board on June 18 and September 23, 2014 for review and comment. On April 21, 2015, the Environmental Quality Board approved the proposed RTCR with modifications. The modifications included separating-out the “Non-RTCR” provisions for additional stakeholder input. The motion was made with the expectation that the “Non-RTCR” provisions would be revisited in short order. On April 30, 2015, the TAC Board voted to recommend that the Department further split the “Non-RTCR” provisions to focus solely on the disinfection requirements and the minor corrections needed to obtain/maintain primacy.

In order to provide additional opportunity for stakeholder input on the disinfection requirements, TAC meetings were convened on May 18, May 26, June 16, and June 30, 2015. During these meetings, 14 water systems and organizations delivered presentations to help inform the discussion including:

Pennsylvania American	Western Berks Water Authority
North Penn Water Authority	United Water
York Water Company	Corona Environmental Consulting
Centers for Disease Control	Philadelphia Water Department
Chester Water Authority	Columbia Water Company
Lehigh County Authority	Aqua Pennsylvania
EPA OGWDW	

These stakeholder presentations and other materials provided by the Department may be found on the Department’s website (select Advisory Committees, then select Small Water System Technical Assistance Center Board).

Two additional meetings were held with large water systems on June 29 and July 16, 2015 to gather additional comments. The following water suppliers and organizations attended these additional meetings:

Chester Water Authority	Columbia Water Company
York Water Company	Lehigh County Authority
Western Berks Water Authority	North Penn Water Authority
Aqua Pennsylvania	Water Works Operators’ Association – TAC Chair
Pennsylvania American	Suez Water
PA Municipal Authorities Association	Philadelphia Water Department
Superior Water Co/ National Association of Water Companies	Corona Environmental

As a result of these six additional stakeholder meetings, several revisions were made during the pre-draft rulemaking process, including revisions to the minimum required disinfectant residual levels, monitoring and reporting requirements, and compliance determinations. These revisions were made to address concerns about compliance costs and the frequency of public notification. The TAC Board provided a final set of recommendations on July 15, 2015. Many of the TAC Board’s recommendations were

incorporated into the proposed rulemaking. Other recommendations were incorporated into the preamble of the proposed rulemaking as a means to solicit further public comment. Please refer to the preamble for the proposed rulemaking for more information about the TAC Board's recommendations.

The proposed rulemaking was published in the *Pennsylvania Bulletin* on February 20, 2016, with a 60-day comment period to allow adequate time for industry stakeholders and the public to submit comments. Additionally, three public hearings were held (Norristown, Harrisburg, and Pittsburgh) during the public comment period.

Several revisions were made to the draft final-form regulation in response to the comments received.

The draft final-form rulemaking was presented to the TAC Board on July 13, 2017. The TAC Board requested additional time to solicit input from their organizations so a second meeting was held on August 24, 2017, at which time the TAC Board provided their final recommendations. The TAC Board made nine recommendations, six of which were incorporated into this final-form rulemaking and one that will be incorporated in guidance.

(15) Identify the types and number of persons, businesses, small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012) and organizations which will be affected by the regulation. How are they affected?

A review of the USA Small Business Size Regulations under 13 CFR Chapter 1, Part 121 provides a standard for determining what constitutes a small business for the NAICS category relating to PWS. A PWS falls within NAICS category 221310, Water Supply and Irrigation Systems, which comprises establishments primarily engaged in operating water treatment plants and/or operating water supply systems. The small size standard for this NAICS category is annual receipts of not more than \$27.5 million.

The SDWA and Chapter 109 regulations do not contain any requirements for the submission of financial records. The Department has no way to estimate annual receipts of PWSs. The Department and EPA have historically classified system size based on the number of persons served by a water system. Under the federal Safe Drinking Water regulations, there are three classifications: small, medium, and large. Small systems serve 3,300 persons or fewer, medium systems serve 3,301 to 50,000 persons, and large systems serve more than 50,000 persons. See 40 CFR 141.2. Therefore, the Department used the federal definition of a small water system in 40 CFR 141.2, which states that a small water system is "a water system that serves 3,300 persons or fewer". Under this regulatory package, a PWS owned by a private individual or investor serving less than or equal to 3,300 persons was considered to be a small business. Some medium size systems may be classified as small businesses on the basis of revenue. It is believed that the revenues of large systems are generally over \$27.5 million.

- The disinfection requirements apply to all 1,949 CWSs. Of these, 925 are small systems that are owned by a private individual or investor and should be considered as small businesses.
- The disinfection requirements also apply to 746 NCWSs. All of these systems should be considered as small businesses.
- The total number of small businesses affected by this regulation is 1,671.

The persons and communities served by these systems will benefit from increased microbial protection and avoidance of waterborne disease outbreaks. Costs for small systems are not expected to increase,

because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the Groundwater Rule.

(16) List the persons, groups or entities, including small businesses, that will be required to comply with the regulation. Approximate the number that will be required to comply.

- The disinfection requirements apply to all 1,949 CWSs. Of these, 925 are small systems that are owned by a private individual or investor and should be considered as small businesses.
- The disinfection requirements also apply to 746 NCWSs. All of these systems should be considered as small businesses.
- The total number of public water systems affected by this regulation is 2,695. This includes 1,671 small businesses.

(17) Identify the financial, economic and social impact of the regulation on individuals, small businesses, businesses and labor communities and other public and private organizations. Evaluate the benefits expected as a result of the regulation.

The expected benefits of this regulation are: (1) the avoidance of a full range of health effects from the consumption of contaminated drinking water such as acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death; and (2) healthy and sustainable communities.

This regulation will provide a positive economic impact to individuals, small businesses and businesses that provide services to the drinking water industry.

The amendments are intended to reduce the public health risks and associated costs related to waterborne pathogens and waterborne disease outbreaks. Costs related to waterborne disease outbreaks are extremely high. For example, in 2008, a large *Salmonella* outbreak caused by contamination of a storage tank and distribution system and no disinfectant residual within the municipal drinking water supply occurred in Alamosa, Colorado. The outbreak's estimated total cost to residents and businesses of Alamosa using a Monte Carlo simulation model (10,000 iterations) was approximately \$1.5 million (range: \$196,677–\$6,002,879), and rose to \$2.6 million (range: \$1,123,471–\$7,792,973) with the inclusion of outbreak response costs to local, state and nongovernmental agencies and City of Alamosa healthcare facilities and schools. This investigation documents the significant economic and health impacts associated with waterborne disease outbreaks and highlights the potential for loss of trust in public water systems following such outbreaks. This information can be found in the following study: Economic and Health Impacts Associated with a *Salmonella* Typhimurium Drinking Water Outbreak—Alamosa, CO, 2008. Available from URL: <http://www.ncbi.nlm.nih.gov/pubmed/23526942>

Disinfectant Residual Monitoring at the Entry Point:

The Department estimates that 114 out of 353 plants (or ~30%) may be using paper chart recorders. Paper chart recorders can record measurements to two decimal places if the suitable scale and resolution is used. In cases where the requisite scale and resolution is not possible, an upgrade to electronic recording devices would cost approximately \$1,500. The Department estimates that 10% of these systems or 11 systems may need to upgrade to electronic recording devices.

This cost should not be prohibitive for filter plants and the use of electronic devices offers several advantages. Advantages of using electronic recording devices include improved data reliability, faster and more comprehensive data analysis, better data resolution, elimination of the need for interpolating

trace values from a chart, cost savings through the elimination of consumables (pens and chart paper), and reductions in errors associated with transferring 'analog' data to a spreadsheet for recordkeeping or reporting purposes.

Disinfectant Residuals in the Distribution System:

It is anticipated that the large majority of water systems will be able to comply with the disinfection residual requirements with little to no capital costs because many of these systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. There are 1,949 CWSs that are required to provide and maintain disinfection treatment. Of these systems, 1,298 (67%) are required to collect only one disinfectant residual measurement each month. An additional 232 systems are only required to collect two measurements each month. In total, 1,530 systems (79%) are only required to collect one or two disinfectant residual measurements each month; which means the average result reported each month for the large majority of systems is representative of the actual sample results.

The Department reviewed the summary data (distribution system disinfectant residual average result values) from Jan 2012-May 2017 for the 1,949 CWSs.

- During this period, 165,328 average result values were reported; of these records, 154,623 average result values (93.5%) were at or above 0.15 mg/L.
- For the systems that are required to conduct only 1 or 2 measurements each month, 136,743 average result values were reported; of these records, 126,406 average result values (92.4%) were at or above 0.15 mg/L.
- For the systems that only conduct 1 measurement each month, 116,900 average result values were reported; of these records, 107,366 (91.8%) were at or above 0.15 mg/L.

The below table shows the number of CWSs and the number of average result summary records submitted for each population group.

CWS Disinfectant Average Result by Population Category

Population Group	No. Samples Required	No. PWSs	Total POPL ¹	Total No. Records	No. Results < 0.15	No. Results ≥ 0.15
< 25 ²	1	9	172	300	14	286
25-1,000	1	1290	311,515	116,600	9,520	107,080
1,001-2,500	2	231	381,322	19,843	803	19,040
2,501-3,300	3	86	255,069	6,292	168	6,124
3,301-4,100	4	28	103,784	2,534	65	2,469
4,101-4,900	5	37	164,629	2,518	11	2,507
4,901-5,800	10	27	145,425	1,752	0	1,752
5,801-6,700	15	22	137,596	1,672	1	1,671
6,701-7,600	20	22	156,720	1,246	0	1,246
7,601-8,500	25	22	178,117	1,194	22	1,172
8,501-12,900	30	46	469,925	3,311	34	3,277
12,901-33,000	35	69	1,436,581	4,333	66	4,267
> 33,000	≥ 40	60	7,628,402	3,733	1	3,732
Total	----	1,949	11,369,257	165,328	10,705	154,623

¹Total POPL is the total population served for the population category, based on the CWS population in PADWIS. The Revised Total Coliform Rule required water systems to submit a revised sampling plan which included updated population numbers in accordance with existing EPA guidance. The CWS population served includes nontransient and transient consumers.

²These CWSs triggered applicability under the SDWA because each system provides water to 15 or more service connections.

There are an additional 621 noncommunity water systems with disinfection treatment that are currently required to maintain a disinfectant residual in the distribution system. Of these 621 water systems, 598 (96%) are only required to collect one or two residual measurements each month; 554 (89%) are only required to conduct one measurement each month.

Therefore, the Department believes it is appropriate to use the average result data, and that the data indicate that a vast majority of the water systems are already in compliance with these minimum disinfection residual requirements.

Some systems may need to increase the frequency of or improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair practices, in order to lower chlorine demand and meet disinfectant residual requirements at all points in the distribution system.

A few medium and large water systems with extensive distribution systems may need to install automatic flushing systems, tank mixers or booster chlorination stations in order to achieve a 0.2 mg/L residual at all points in the distribution system. The Department's estimates for these facilities are as follows:

Type of Facility	Capital Expenses	Annual Expenses
Automatic flushing device	\$2,500	\$750
Tank mixer	\$75,000	\$0
Booster chlorination station	\$250,000	\$10,000

It is estimated that 25% of community water systems serving over 25,000 people, or ~20 systems, may need to install automatic flushing devices, tank mixers or booster chlorination stations. Of these 20 systems:

- 12 water systems may need to install up to ten automatic flushing devices for capital costs of up to \$25,000 and annual expenses of up to \$7,500 per system. The total cost for 12 systems is estimated at to be as much as \$300,000 in capital costs and as much as \$90,000 in annual expenses.
- Four water systems may need to install up to two tank mixers for capital costs of up to \$150,000 per system. The total cost for four systems is estimated to be up to \$600,000 in capital costs.
- Four systems may need to install up to four booster chlorination stations for capital costs of up to \$1,000,000 and annual expenses of up to \$40,000 per system. The total cost for four systems is estimated to be up to \$4,000,000 in capital costs and up to \$160,000 in annual expenses.

Costs for small systems are not expected to increase because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the Groundwater Rule.

Total estimated costs to the regulated community = \$4,900,000 in capital costs and \$250,000 in annual expenses.

(18) Explain how the benefits of the regulation outweigh any cost and adverse effects.

The amendments strengthen existing requirements that protect public health through a multi-barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and the integrity of drinking water distribution systems.

Safe drinking water is vital to maintaining healthy and sustainable communities. Proactively avoiding incidents such as waterborne disease outbreaks can prevent loss of life, reduce the incidents of illness, and reduce health care costs. Proper investment in public water system infrastructure and operations helps ensure a continuous supply of safe drinking water; enables communities to plan and build future capacity for economic growth; and ensures their long-term sustainability for years to come.

(19) Provide a specific estimate of the costs and/or savings to the **regulated community** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

Disinfectant Residual Monitoring at the Entry Point:

The Department estimates that 114 out of 352 plants (or ~30%) may be using paper chart recorders. The Department believes that most paper chart recorders can record measurements to two decimal places provided the proper scale and resolution is used. In cases where the requisite scale and resolution is not possible, an upgrade to electronic recording devices would cost approximately \$1,500. The Department estimates that 10% of these systems (or 11 systems) may need to upgrade to electronic recording devices.

- 11 systems x \$1,500 = \$16,500

This cost should not be prohibitive for filter plants and the use of electronic devices offers several advantages. Advantages of using electronic recording devices include improved data reliability, faster and more comprehensive data analysis, better data resolution, elimination of the need for interpolating trace values from a chart, cost savings through the elimination of consumables (pens and chart paper), and reductions in errors associated with transferring 'analog' data to a spreadsheet for recordkeeping or reporting purposes.

Disinfectant Residuals in the Distribution System:

It is anticipated that the large majority of water systems will be able to comply with the disinfection residual requirements with little to no capital costs.

Some systems may need to increase the frequency of or improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair practices, in order to lower chlorine demand and meet disinfectant residual requirements at all points in the distribution system.

A few medium and large water systems with extensive distribution systems may need to install automatic flushing systems, tank mixers or booster chlorination stations in order to achieve a 0.2 mg/L

residual at all points in the distribution system. The Department's estimates for these facilities are as follows:

Type of Facility	Capital Expenses	Annual Expenses
Automatic flushing device	\$2,500	\$750
Tank mixer	\$75,000	
Booster chlorination station	\$250,000	\$10,000

It is estimated that 25% of community water systems serving over 25,000 people, or ~20 systems, may need to install automatic flushing devices, tank mixers or booster chlorination stations. Of these 20 systems:

- 12 water systems may need to install up to ten automatic flushing devices for capital costs of up to \$25,000 and annual expenses of up to \$7,500 per system. The total cost for 12 systems is estimated at to be as much as \$300,000 in capital costs and as much as \$90,000 in annual expenses.
- Four water systems may need to install up to two tank mixers for capital costs of up to \$150,000 per system. The total cost for four systems is estimated to be up to \$600,000 in capital costs.
- Four systems may need to install up to four booster chlorination stations for capital costs of up to \$1,000,000 and annual expenses of up to \$40,000 per system. The total cost for four systems is estimated to be up to \$4,000,000 in capital costs and up to \$160,000 in annual expenses.

Costs for small systems are not expected to increase because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the Groundwater Rule.

Total estimated costs to the regulated community = \$4,900,000 in capital costs and \$250,000 in annual expenses.

However, these costs are offset by the avoidance of water borne disease outbreaks which can result in costs to residents and businesses of \$1.5 million, and additional costs to local, state and nongovernmental agencies, healthcare facilities and schools of \$1.1 million.

(20) Provide a specific estimate of the costs and/or savings to the **local governments** associated with compliance, including any legal, accounting or consulting procedures which may be required. Explain how the dollar estimates were derived.

The only costs to local government will be costs incurred by systems that are owned and/or operated by local government. The cost estimates are based on the figures in question 19.

However, these costs are offset by the avoidance of water borne disease outbreaks which can result in costs to residents and businesses of \$1.5 million, and additional costs to local, state and nongovernmental agencies, healthcare facilities and schools of \$1.1 million.

(21) Provide a specific estimate of the costs and/or savings to the **state government** associated with the implementation of the regulation, including any legal, accounting, or consulting procedures which may be required. Explain how the dollar estimates were derived.

The costs or savings to state government will be those incurred or realized by systems that are owned and/or operated by state government and costs associated with implementing and administering the rule. The cost and savings estimates are based on the figures in question 19.

State costs associated with administering these revisions are not expected to substantially increase or decrease. This rulemaking proposes revisions to existing treatment technique requirements.

(22) For each of the groups and entities identified in items (19)-(21) above, submit a statement of legal, accounting or consulting procedures and additional reporting, recordkeeping or other paperwork, including copies of forms or reports, which will be required for implementation of the regulation and an explanation of measures which have been taken to minimize these requirements.

Reporting requirements include:

- Electronic reporting of log inactivation values on a monthly basis using existing formats.
- Electronic reporting of additional disinfectant residual levels measured in the distribution system using existing formats.

Recordkeeping and paperwork requirements include:

- Development, maintenance and retention of a disinfectant residual sample siting plan.
- Development, maintenance and retention of a nitrification control plan.

As indicated above, whenever possible, existing formats and forms will be used.

(22a) Are forms required for implementation of the regulation?

Yes, but only one new form is needed.

- Log inactivation values and distribution disinfectant residual values will be electronically reported through the Drinking Water Electronic Lab Reporting system (DWELR) using existing formats.
- DEP has developed a template for the disinfectant residual sample siting plan.
- The nitrification control plan is a system specific plan that does not require a form. Water systems may document the required elements in a suitable format. This plan is not submitted to DEP but is maintained by the water system to be reviewed by DEP during inspections.

(22b) If forms are required for implementation of the regulation, **attach copies of the forms here**. If your agency uses electronic forms, provide links to each form or a detailed description of the information required to be reported. **Failure to attach forms, provide links, or provide a detailed description of the information to be reported will constitute a faulty delivery of the regulation.**

- The log inactivation and distribution disinfectant residual values that must be electronically submitted is detailed in an existing paper form (SDWA-1) which is available on DEP's eLibrary at: <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8832>

- The disinfectant residual sample siting plan template is attached.

(23) In the table below, provide an estimate of the fiscal savings and costs associated with implementation and compliance for the regulated community, local government, and state government for the current year and five subsequent years.

	Current FY 2017/18	FY +1 2018/19	FY +2 2019/20	FY +3 2020/21	FY +4 2021/22	FY +5 2022/23
SAVINGS:	\$	\$	\$	\$	\$	\$
Regulated Community	0	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Local Government	0	550,000	550,000	550,000	550,000	550,000
State Government	0	550,000	550,000	550,000	550,000	550,000
Total Savings	0	2,600,000	2,600,000	2,600,000	2,600,000	2,600,000
COSTS:						
Regulated Community	0	1,630,000	1,880,000	1,880,000	250,000	250,000
Local Government	0	0	0	0	0	0
State Government	0	0	0	0	0	0
Total Costs	0	1,630,000	1,880,000	1,880,000	250,000	250,000
REVENUE LOSSES:						
Regulated Community	0	0	0	0	0	0
Local Government	0	0	0	0	0	0
State Government	0	0	0	0	0	0
Total Revenue Losses	0	0	0	0	0	0

Note:

Cost savings: If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools, for a total savings of \$2.6 million.

Costs: Total estimated costs to the regulated community = \$4,900,000 in capital costs and \$250,000 in annual operational expenses. Capital costs are one-time costs split over three years. Annual operational expenses are not expected to begin until year two.

(23a) Provide the past three year expenditure history for programs affected by the regulation.

Program	FY -3 2014/15	FY -2 2015/16	FY -1 2016/17	Current FY 2017/18
Environmental Program Operations	\$6,972,000	\$6,803,000	\$7,079,000	\$2,525,000
Environmental Program Management	\$296,000	\$334,000	\$366,000	\$208,000
General Government Operations	\$0	\$0	\$0	\$0
Safe Drinking Water Act	\$51,000	\$62,000	\$55,000	\$50,000

(24) For any regulation that may have an adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), provide an economic impact statement that includes the following:

- (a) An identification and estimate of the number of small businesses subject to the regulation.

The disinfection requirements apply to all 1,949 CWSs. Of these, 925 are small systems that are owned by a private individual or investor and should be considered as small businesses. The disinfection requirements also apply to 746 NCWSs. All of these systems should be considered as small businesses. The total number of small businesses affected by this regulation is 1,671 (as defined in Question 15).

- (b) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed regulation, including the type of professional skills necessary for preparation of the report or record.

Administrative costs associated with these revisions are not expected to substantially increase.

- (c) A statement of probable effect on impacted small businesses.

Most small systems are not expected to be impacted by these revisions because they are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the Groundwater Rule.

- (d) A description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation.

No alternative regulatory schemes were considered.

(25) List any special provisions which have been developed to meet the particular needs of affected groups or persons including, but not limited to, minorities, the elderly, small businesses, and farmers.

The amendments should have no effects on one particular group relative to another since it will apply to most of Pennsylvania's population served by public water systems. However, the Safe Drinking Water Program is prepared to develop special provisions or provide special services to accommodate any such group as the need arises.

(26) Include a description of any alternative regulatory provisions which have been considered and rejected and a statement that the least burdensome acceptable alternative has been selected.

No alternative regulatory schemes were considered.

(27) In conducting a regulatory flexibility analysis, explain whether regulatory methods were considered that will minimize any adverse impact on small businesses (as defined in Section 3 of the Regulatory Review Act, Act 76 of 2012), including:

- a) The establishment of less stringent compliance or reporting requirements for small businesses;
For these provisions, no less stringent compliance or reporting requirements for small businesses were considered.
- b) The establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses;
For these provisions, no less stringent schedules or deadlines for small businesses were considered.
- c) The consolidation or simplification of compliance or reporting requirements for small businesses;
For these provisions, neither consolidation nor simplification of compliance or reporting requirements for small businesses was considered.
- d) The establishment of performing standards for small businesses to replace design or operational standards required in the regulation; and
For these provisions, no performing standards for small businesses to replace design or operational standards required in the regulation for small businesses were considered.
- e) The exemption of small businesses from all or any part of the requirements contained in the regulation.
For these provisions, no exemptions for small businesses from all or any part of the requirements contained in the regulation were considered.

Alternative provisions were not considered for small water systems because the customers of water systems classified as small businesses must be afforded the same level of public health protection as customers of large water systems.

(28) If data is the basis for this regulation, please provide a description of the data, explain in detail how the data was obtained, and how it meets the acceptability standard for empirical, replicable and testable data that is supported by documentation, statistics, reports, studies or research. Please submit data or supporting materials with the regulatory package. If the material exceeds 50 pages, please provide it in a searchable electronic format or provide a list of citations and internet links that, where possible, can be accessed in a searchable format in lieu of the actual material. If other data was considered but not used, please explain why that data was determined not to be acceptable.

Substantial studies, reports and data were used to develop this rulemaking, including the following:

1. Berg, G., "The Virus Hazard in Water Supplies," *J. New England Water Works Association*, 1964, Vol. 78, pp. 79.
2. Butterfield, C. T., "Bactericidal Properties of Chloramines and Free Chlorine in Water," *Public Health Reports*, 1948, Vol. 63, pp. 934, *J. American Water Works Association*, 1948, Vol. 40, pp. 1305.
3. Colorado Department of Public Health and Environment, "Draft – Minimum Distribution System Disinfectant Residuals: Chlorine Residual Values Reported from Within Drinking Water Distribution Systems," April 2014.
4. Fair, G. M. et al, *Water and Waste Engineering*, J. Wiley & Sons, Inc., 1968.
5. Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (10 States Standards), "Recommended Standards for Waterworks," 2012 Edition.
6. Hach Company, "Chlorination, Chloramination and Chlorine Measurement," 2013.
7. Hach Company, "Primer on DPD Chlorine Method Detection Limits and Their Use in Compliance Monitoring," June 2015.
8. LeChevallier, M. W., "The Case for Maintaining a Disinfectant Residual," *J. American Water Works Association*, 1999, Vol. 91, Issue 1, pp. 86.
9. LeChevallier, M. W. et al, "Full-Scale Studies of Factors Related to Coliform Regrowth in Drinking Water," *Appl. & Envir. Microbiol.*, 1996, Vol. 62, No. 7, pp. 2201.
10. LeChevallier, M. W., 2007, "Sources of Coliform Bacteria and Causes of Coliform Occurrences in Distribution Systems," www.waterrf.org/resources/Lists/ProjectPapers/Attachments/3/IssuePapers.pdf.
11. LeChevallier, M. W., "Conducting Self-Assessments Under the Revised Total Coliform Rule," *J. American Water Works Association*, September 2014, 106:9, pp. 90.
12. National Research Council, "Public Water Supply Distribution Systems: Assessing and Reducing Risks, First Report," 2005, <http://www.nap.edu/catalog/11262.html> .
13. National Research Council, "Drinking Water Distribution Systems: Assessing and Reducing Risks," 2006, <http://www.nap.edu/catalog/11728.html> .
14. PA DEP, "Pennsylvania Public Water System Compliance Report for 2014."
15. Pressman, J. G. & Wahman, D. G., "Perspectives on the Meaning of Detectable Distribution System Residual and Implications for *N. fowleri* Control," "AWWA Water Quality Technology Conference, November 2014, New Orleans, LA.
16. Wahman, D. G. & Pressman, J. G. , "Distribution System Residuals – Is "Detectable" Still Acceptable for Chloramines", *J. American Water Works Association*, August 2015, 107:8, pp. 53.
17. US DHHS, Centers for Disease Control and Prevention, "Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water and Other Nonrecreational Water – US, 2009-2010, *MMWR*, Weekly, Vol. 62, No. 35, September 2013.

18. US EPA, April 2010, "Final – Priorities of the Distribution System Research and Information Collection Partnership".
19. US EPA, April 2013, "Drinking Water Infrastructure Needs Survey and Assessment, Fifth Report to Congress," EPA 816-R-13-006.
20. US EPA, 2002a, "The Effectiveness of Disinfectant Residuals in the Distribution System," http://www.epa.gov/safewater/disinfection/tcr/regulation_revisions.html .
21. US EPA, 2002b, "Health Risks from Microbial Growth and Biofilms in Drinking Water Distribution Systems," http://www.epa.gov/safewater/disinfection/tcr/regulation_revisions.html .
22. US EPA, Enforcement and Compliance History Online (ECHO) database.
23. US EPA, December 2016, "Six-Year Review 3 Technical Support Document for Microbial Contaminant Regulations", EPA 810-R-16-010, <https://www.epa.gov/sites/production/files/2016-12/documents/810r16010.pdf> .
24. Water Research Foundation, "Criteria for Optimized Distribution Systems," 2010.
25. Water Research Foundation, "State of the Science and Research Needs for Opportunistic Pathogens in Premise Plumbing," 2013.
26. Water Research Foundation, "Strategies for Managing Total Coliform and *E. coli* in Distribution Systems," 2009.

Also, copies of other state's regulations were reviewed. 23 states have more stringent requirements.

State	Minimum Distribution System Residual (mg/L)
Alabama*	0.2 (free), 0.5 (total)
Colorado*	0.2 (free or total)
Delaware	0.3 (free)
Florida*	0.2 (free), 0.6 (total)
Georgia	0.2 (free)
Illinois*	0.2 (free), 0.5 (total)
Indiana	0.2 (free), 0.5 (total)
Iowa	0.3 (free), 1.5 (total)
Kansas*	0.2 (free), 1.0 (total)
Kentucky*	0.2 (free), 0.5 (total)
Louisiana*	0.5 (free or total)
Minnesota	0.1 (free or total)
Missouri	0.2 (total)
Nebraska	SW - 0.2 (free), 0.25 or 0.5 (total); GW – 0.1 (free)
Nevada	0.05 (free or total)
New Jersey*	0.05 (free or total)
North Carolina*	0.2 (free), 1.0 (total)
Ohio*	0.2 (free), 1.0 (total)
Oklahoma	0.2 (free), 1.0 (total)
Tennessee*	0.2 (free)
Texas*	0.2 (free), 0.5 (total)
Vermont	0.1 (free)
West Virginia*	0.2 (total)

*States with mandatory disinfection.

Finally, total coliform rule (TCR) and disinfection by-product (DBP) compliance data from EPA's ECHO website was reviewed to compare other state's compliance rates with Pennsylvania's.

(29) Include a schedule for review of the regulation including:

- A. The date by which the agency must receive public comments: March 2016
- B. The date or dates on which any public meetings or hearings will be held: 3 hearings:
Harrisburg - 3/28/2016
Norristown - 4/5/2016
Pittsburgh - 4/7/2016
- C. The expected date of delivery of the final-form regulation: Quarter 4, 2017
- D. The expected effective date of the final-form regulation: Quarter 1, 2018
- E. The expected date by which compliance with the final-form regulation will be required: Some provisions are effective upon publication of the final-form rulemaking; the distribution disinfectant residual provisions are delayed for 6-12 months after publication of the final-form rulemaking.
- F. The expected date by which required permits, licenses or other approvals must be obtained: 1 year after the publication date of the final-form regulation (unless an alternate schedule is approved).

(30) Describe the plan developed for evaluating the continuing effectiveness of the regulations after its implementation.

The Board is not establishing a sunset date for this regulation, since it is needed for the Department to carry out its statutory authority. The Department will continue to closely monitor this regulation for its effectiveness and recommend updates to the Board as necessary.

DRAFT
DISTRIBUTION DISINFECTANT RESIDUAL SAMPLE SITING PLAN

Part 2: Sampling Information

A. Sample Location Information

Location ID	Site location (address and tap location)	Location also used for: (check all that apply)	Representative Location Code*	Mixing Zone & Continuous Monitoring
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		<input type="checkbox"/> Mixing Zone <input type="checkbox"/> Cont. Monit. <input type="checkbox"/> Grab Sample
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		
		<input type="checkbox"/> RTRC <input type="checkbox"/> LCR <input type="checkbox"/> TTHM / HAA5		

*Representative Location Codes:

- 1 – General Distribution Location
- 2 – Dead End
- 3 – First Service Connection
- 4 – Finished Water Storage Facility

- 5 – Interconnection with another PWS
- 6 – Area of high water age
- 7 – Area of previous coliform-positive sample(s)

Use additional pages as necessary.

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Attorney General

By: _____
(Deputy Attorney General)

DATE OF APPROVAL

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Copy below is hereby certified to be true and
correct copy of a document issued, prescribed or
promulgated by:

DEPARTMENT OF ENVIRONMENTAL
PROTECTION
ENVIRONMENTAL QUALITY BOARD

(AGENCY)

DOCUMENT/FISCAL NOTE NO. 7-520

DATE OF ADOPTION DECEMBER 12, 2017

BY _____

TITLE PATRICK MCDONNELL
CHAIRMAN

EXECUTIVE OFFICER CHAIRMAN OR SECRETARY

Copy below is hereby approved as to form and legality
Executive or Independent Agencies

BY Marisa A. Z. Len

JAN 11 2018
DATE OF APPROVAL

(Deputy General Counsel)
~~(Chief Counsel Independent Agency)~~
(Strike inapplicable title)

Check if applicable. No Attorney General Approval
or objection within 30 days after submission.

NOTICE OF FINAL RULEMAKING

DEPARTMENT OF ENVIRONMENTAL PROTECTION
ENVIRONMENTAL QUALITY BOARD

Disinfection Requirements Rule

25 Pa. Code Chapter 109

**NOTICE OF FINAL RULEMAKING
ENVIRONMENTAL
QUALITY BOARD
[25 PA. CODE CH. 109]
Disinfection Requirements Rule**

The Environmental Quality Board (Board) by this order amends Chapter 109 (relating to safe drinking water) to read as set forth in Annex A. The amendments will strengthen water system requirements relating to microbial protection and disinfection requirements.

The amendments also include minor clarifications to ensure consistency with and obtain or maintain primary enforcement authority for several Federal rules promulgated by the U.S. Environmental Protection Agency (EPA), including the Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2 DBPR) (71 FR 388 (January 4, 2006)), Long Term 2 Enhanced Surface Water Treatment Rule (LT2) 71 FR 654 (January 5, 2006), and the Lead and Copper Rule Short-Term Revisions (LCRSTR) (72 FR 57782 (October 10, 2007)). Chapter 109 was previously amended to implement these Federal rules (*see* 39 Pa.B. 7279 (December 26, 2009) relating to Stage 2 DBPR and LT2, and 40 Pa.B. 7212 (December 18, 2010) relating to LCRSTR).

The amendments will protect public health through a multiple barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and by ensuring the integrity of drinking water distribution systems.

Safe drinking water is vital to maintaining healthy and sustainable communities. Proactively avoiding incidents such as waterborne disease outbreaks can prevent loss of life, reduce the incidents of illness and reduce health care costs. Proper investment in public water system infrastructure and operations helps ensure a continuous supply of safe drinking water, enables communities to plan and build future capacity for economic growth, and ensures their long-term sustainability.

The disinfectant residual requirements in the distribution system will apply to all 1,949 community water systems and those noncommunity water systems that have installed disinfection (746) for a total of 2,695 public water systems. These public water systems serve a total population of 11.3 million people.

The CT/log inactivation monitoring and reporting requirements will apply to all 353 filter plants which are operated by 319 water systems.

This final-form rulemaking was adopted by the Board at its meeting of December 12, 2017.

A. *Effective Date*

This final-form rulemaking is effective upon publication in the *Pennsylvania Bulletin*. Based on advisory committee and public comments, the final-form rulemaking includes the following deferred implementation dates:

- The submission of a sample siting plan is required six months after the effective date to allow time for development of the plan.
- The development of a nitrification control plan is required one year after the effective date.
- The amended monitoring, reporting, and treatment technique requirements for the disinfectant residual in the distribution system are required one year after the effective date to allow additional time for operational changes and to effectively increase disinfectant residuals to 0.2 milligrams per liter (mg/L) throughout the distribution system. If additional time is needed for capital improvements or to complete more substantial operational changes, a system-specific compliance schedule may be requested.

B. *Contact Persons*

For further information, contact Lisa D. Daniels, Director, Bureau of Safe Drinking Water, P. O. Box 8467, Rachel Carson State Office Building, Harrisburg, PA 17105-8467, (717) 787-9633; or William Cumings, 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 at (800) 654-5984 (TDD users) or (800) 654-5988 (voice users).

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 section 1920-A of The Administrative Code of 1929 (71 P. S. § 510-20), which authorizes the Board to promulgate rules and regulations necessary for the performance of the work of the Department.

D. *Background and Purpose*

Amendments to surface water treatment regulations regarding monitoring and reporting

The amendments include new monitoring and reporting requirements to ensure compliance with existing treatment techniques regarding log inactivation and CT requirements. Log inactivation is a measure of the amount of viable microorganisms that are rendered nonviable during disinfection processes. CT is the product of residual disinfectant concentration (C) and

disinfectant contact time (T). The CT value is used to determine the levels of inactivation under various operating conditions.

Public water systems using surface water or groundwater under the direct influence of surface water (GUDI) sources have long been required to meet log inactivation and CT requirements for the inactivation of Giardia cysts and viruses. These existing treatment technique requirements are intended to ensure that water systems provide adequate and continuous disinfection for the inactivation of pathogens. The only way to ensure compliance with the existing treatment techniques is to measure and record the data elements that are needed to calculate CTs (that is, disinfectant residual, temperature, pH, flow, and volume) and report the results.

The amendments also clarify and strengthen the minimum residual disinfectant level at the entry point by adding a zero to the minimum level (0.20 mg/L). Water suppliers will be required to maintain a residual that is equal to or greater than 0.20 mg/L. Currently, levels of 0.15 mg/L or higher round up to 0.2 mg/L and are considered in compliance. A level of 0.20 mg/L is necessary due to the importance of meeting CTs and of maintaining an adequate disinfectant residual in the water entering the distribution system. Also, this level of sensitivity is consistent with existing requirements for the Groundwater Rule (0.40 mg/L) as specified in § 109.1302(a)(2) (relating to treatment technique requirements). Finally, this level of sensitivity is achievable using current instrumentation for the measurement of disinfectant residuals.

Amendments to disinfectant residual requirements in the distribution system

The amendments are intended to strengthen the distribution system disinfectant residual requirements by increasing the minimum residual in the distribution system to 0.2 mg/L free or total chlorine. The Department's previous disinfectant residual requirements for distribution systems had not been substantially updated since 1992 and required the maintenance of a detectable residual that was defined as 0.02 mg/L. The Department's previous treatment technique was not protective of public health because a residual of 0.02 mg/L is below the minimum reporting level of 0.1 mg/L and represents a false positive reading.

Maintenance of a disinfectant residual in the distribution system is:

- Required under the Federal Surface Water Treatment Rule (40 CFR Part 141, Subpart H) for all systems using surface water and GUDI sources and under Chapter 109 for all community water systems and those noncommunity water systems that have installed disinfection.
- Designated by the EPA as the best available technology for compliance with both the Total Coliform Rule (TCR) and the Revised TCR.
- Considered an important element in a multiple barrier strategy aimed at maintaining the integrity of the distribution system and protecting public health.
- Intended to maintain the integrity of the distribution system by inactivating microorganisms in the distribution system, indicating distribution system upset and controlling biofilm growth.

The preamble to the proposed rule (46 Pa.B. 857 (February 20, 2016)) included numerous studies, reports, and data in support of the minimum disinfectant residual of 0.2 mg/L in the distribution system. Additional studies, reports, and data were reviewed for this final-form rulemaking.

EPA published a Six-Year Review 3 (SYR 3) Technical Support Document for Microbial Contaminant Regulations in December 2016 (EPA, 2016). The 1996 Federal Safe Drinking Water Act amendments require EPA to periodically review existing national primary drinking water regulations and determine which, if any, needs to be revised. The purpose of the review, called the SYR, is to identify those regulations for which current health effects assessments, changes in technology, analytical methods, occurrence and exposure, implementation or other factors will improve or strengthen public health protection.

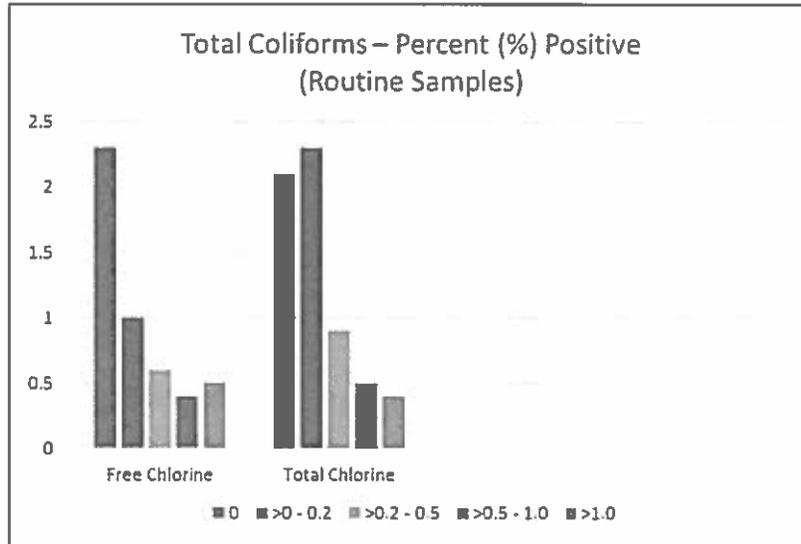
As part of the SYR 3, EPA requested compliance monitoring data from states/tribes from 2006 through 2011 regarding the presence/absence of total coliforms, *E. coli*, and fecal coliforms; and data for disinfectant residual levels in the distribution system. Microbial contaminant data from 34 states/tribes met the quality assurance/quality control criteria and are included in the SYR 3 microbial dataset.

Using the SYR 3 data, EPA conducted an occurrence analysis of microbial indicators paired with disinfectant residual data that are measured at the same time and location. The five bins of free and total chlorine residual concentrations are:

- Bin 1: Concentrations equal to 0 (“not detected or below detection limit”)
- Bin 2: Concentrations >0 and ≤ 0.2 mg/L
- Bin 3: Concentrations >0.2 mg/L and ≤ 0.5 mg/L
- Bin 4: Concentrations >0.5 mg/L and ≤ 1.0 mg/L
- Bin 5: Concentrations >1.0 mg/L

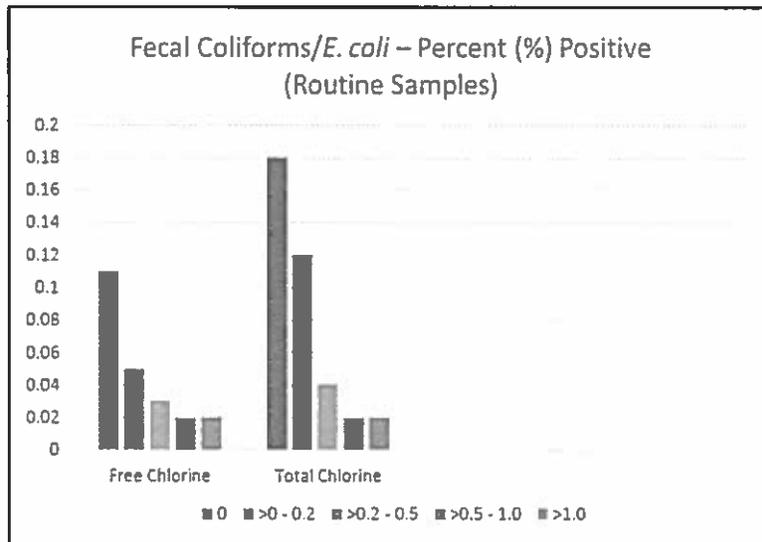
This represents the first national dataset available to evaluate microbial data as a function of disinfectant residual. More than five million samples were used for this analysis. The following figures represent a summary of EPA’s findings.

Figure 1. Summary of percent (%) positive routine total coliform samples for each bin of free and total chlorine residual concentrations (mg/L) from SYR 3 dataset (2006-2011). Dataset = 5.434 million samples.



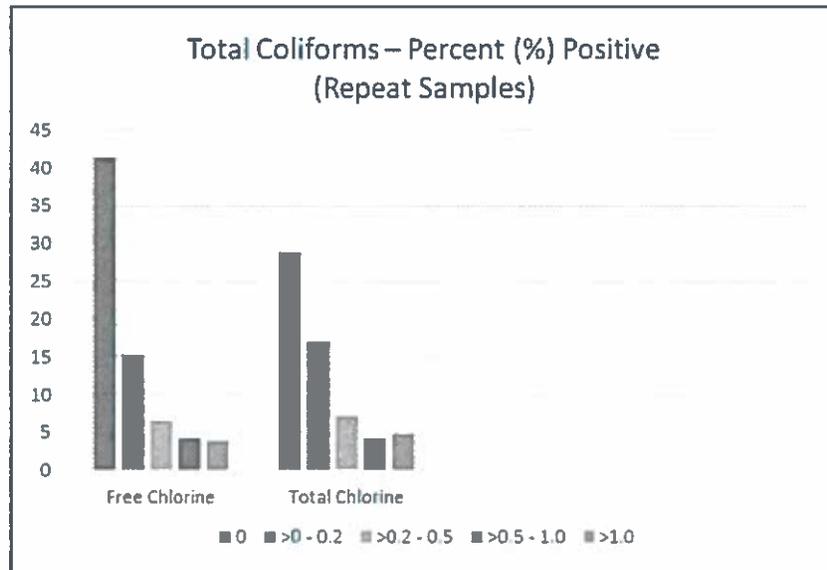
EPA found that for routine samples with free chlorine, the highest percentage of samples that were positive occurred when free chlorine was equal to 0 mg/L (“not detected”). The percentages dropped by more than half for the >0 – 0.2 mg/L bin, then appeared to flatten when free chlorine was >0.2 mg/L. The total coliform positive rate was less than 1% when chlorine residuals were greater than or equal to 0.2 mg/L of free chlorine. EPA found that the trend is similar for total chlorine routine samples except that for total coliforms, the percent of positive samples was slightly higher for the >0 – 0.2 mg/L bin than for the 0 mg/L bin.

Figure 2. Summary of percent (%) positive routine fecal coliform/E. coli samples for each bin of free and total chlorine residual concentrations (mg/L) from SYR 3 dataset (2006-2011). Dataset = 5.434 million samples.



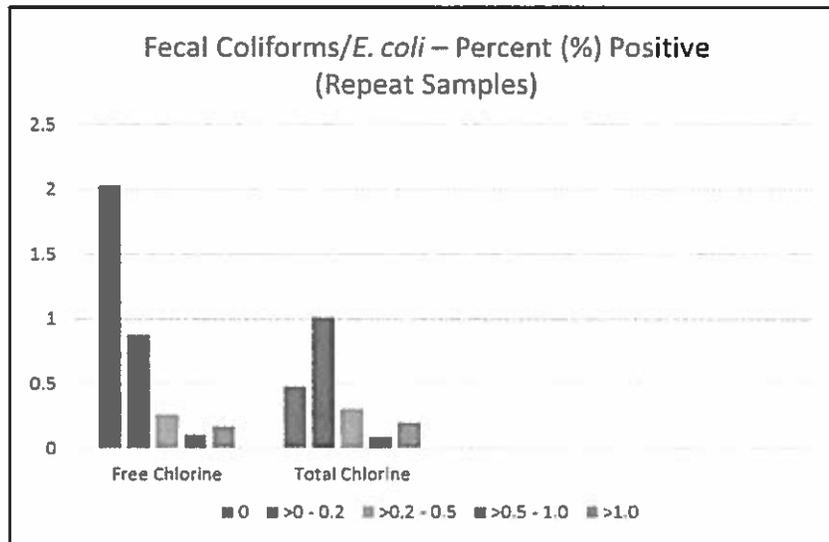
EPA found that the trend is similar for fecal coliforms/*E. coli* positive samples. For total chlorine routine samples, percent positive fecal coliform/*E. coli* results for the >0.2 mg/L – 0.5 mg/L bin were slightly higher than for the >0.5 mg/L – 1.0 mg/L bin and the >1.0 bin, indicating a possible tailing off of the positive occurrence at 0.5 mg/L for total chlorine compared to tailing at 0.2 mg/L free chlorine.

Figure 3. Summary of percent (%) positive repeat total coliform samples for each bin of free and total chlorine residual concentrations (mg/L) from SYR 3 dataset (2006-2011). Dataset = 5.434 million samples.



As expected, EPA found that the percentage of positive total coliform samples was much higher overall for repeat samples than for routine samples. More than 40% of repeat total coliform samples were positive when free chlorine was 0 mg/L, compared to a slightly lower repeat total coliform positive occurrence of ~29% when the total chlorine was 0 mg/L. Similar to routine samples, repeat total coliform positive occurrence declined as free and total chlorine residual increased, with a flattening of occurrence at 0.5 mg/L for both free and total chlorine residuals.

Figure 4. Summary of percent (%) positive repeat fecal coliform/*E. coli* samples for each bin of free and total chlorine residual concentrations (mg/L) from SYR 3 dataset (2006-2011). Dataset = 5.434 million samples.



EPA found that the trend is similar for fecal coliforms/*E. coli* positive samples.

In summary, based on an assessment of 5.434 million samples, EPA determined:

- A lower rate of both total coliform and fecal coliform/*E. coli* positives occurs as the free or total chlorine residual increased to higher levels.
- This relationship between chlorine residuals and occurrence of total coliform and fecal coliform/*E. coli* positives was similar to results reported by the Colorado Department of Public Health and Environment (Ingels, 2015). In addition, this relationship is consistent with the findings of LeChevallier et al. (1996) which stated that disinfectant residuals of 0.2 mg/L or more of free chlorine, or 0.5 mg/L or more of total chlorine, are associated with reduced levels of coliform bacteria. Both of these studies were previously discussed in the preamble to the proposed rule.
- A detectable concentration of disinfectant residual in the distribution system may not be adequately protective of public health due to microbial pathogens. This is based on concerns about analytical methods and the potential for false positives (Wahman and Pressman, 2015). According to EPA, maintaining a disinfectant residual above a set numerical value in the distribution system may improve public health protection from a variety of pathogens.

EPA's concerns about the analytical methods and the potential for false positives is consistent with information provided by HACH[®], the leading manufacturer of field test equipment. HACH[®] provided information to the TAC Board during the development of the proposed rulemaking that supported a minimum reporting level for a disinfectant residual of 0.1 mg/L. Details about this data were included in the preamble to the proposed rule.

This determination is also consistent with a detection limit study that was performed by Aqua Pennsylvania in 2015 in conjunction with the Philadelphia Water Department and Corona Environmental Consulting. A summary of these experiments was included in Aqua Pennsylvania’s public comments. According to Aqua Pennsylvania:

- Aqua’s laboratory conducted 199 determinations for total chlorine residual by the N,N Diethyl-1,4 Phenylenediamine Sulfate (DPD) method using the HACH Pocket Colorimeter II.
- 7 spike concentrations were used: 0.02 mg/L to 0.65 mg/L total chlorine
- While method performance generally improved as spike concentration increased, performance did not clearly degrade at a specific concentration. The range of 0.1 to 0.2 mg/L was not unreasonable as a minimum reporting level.
- These data should be viewed as one piece of information on the topic. A much larger project and national discussion of a “true detectable residual” is needed.

In order to ensure that the Department’s disinfectant residual requirements are adequately protective of public health and are achievable using currently available analytical methods, the Department has retained the level of 0.2 mg/L as a numeric standard. This level represents a standard this is above the minimum reporting level of 0.1 mg/L. Due to EPA’s rules of rounding for compliance determinations, disinfectant residual levels ≥ 0.15 mg/L will round up to 0.2 mg/L and will be in compliance with the numeric standard.

State data

At least 23 states have promulgated more stringent requirements when compared to the Commonwealth's previous standard of 0.02 mg/L. Nineteen of these states have disinfectant residual requirements that are ≥ 0.2 mg/L. The following table includes a summary of other states' requirements, including whether the state allows compliance with the heterotrophic plate count (HPC) standard of 500 as an Alternative Compliance Criteria (ACC).

State	Minimum Distribution System Residual (mg/L)	Allows HPC as ACC
Alabama*	0.2 (free), 0.5 (total)	No
Colorado*	0.2 (free or total)	Yes
Delaware	0.3 (free)	No
Florida*	0.2 (free), 0.6 (total)	No
Georgia	0.2 (free)	Yes
Illinois*	0.2 (free), 0.5 (total)	No
Indiana	0.2 (free), 0.5 (total)	No
Iowa	0.3 (free), 1.5 (total)	Yes
Kansas*	0.2 (free), 1.0 (total)	No
Kentucky*	0.2 (free), 0.5 (total)	No

Louisiana*	0.5 (free or total)	No
Minnesota	0.1 (free or total)	No
Missouri	0.2 (total)	Yes
Nebraska	SW-0.2 (free), 0.25 or 0.5 (total); GW-0.1 (free)	Yes
Nevada	0.05 (free or total)	No
New Jersey*	0.05 (free or total)	Yes
North Carolina*	0.2 (free), 1.0 (total)	Yes
Ohio*	0.2 (free), 1.0 (total)	No
Oklahoma	0.2 (free), 1.0 (total)	No
Tennessee*	0.2 (free)	No
Texas*	0.2 (free), 0.5 (total)	No
Vermont	0.1 (free)	No
West Virginia*	0.2 (total)	No

* States with mandatory disinfection

Of the 19 states with disinfectant residual requirements ≥ 0.2 mg/L, only six of these states retained the alternative compliance criteria for HPC. The Board requested comment on references to studies, reports, or data that provide supporting evidence that an HPC < 500 provides an equivalent level of public health protection when compared to a disinfectant residual of 0.2 mg/L. One citation was provided. However, the EPA document that was referenced was an unpublished draft document. Because of the lack of available studies on this issue and the fact that the majority of states (68%) listed above do not allow the use of HPC as an ACC, the Board has reaffirmed the decision to not allow the use of HPC as an ACC.

The disinfectant residual requirements aim to strike a balance between improving microbial inactivation while limiting adverse impacts on disinfection byproduct (DBP) formation. Water systems can meet more stringent disinfectant residual requirements and still comply with DBP requirements as evidenced by a review of TCR and DBP compliance data from other states (EPA, ECHO web site). The preamble to the proposed rule included graphs that compared the percentage of CWSs with violations for the TCR and DBPs in Alabama, Tennessee, West Virginia, Illinois, Kentucky, Kansas, North Carolina, and Ohio with the compliance rates in Pennsylvania. From 2011 to 2014, the large majority of states requiring disinfectant residual levels ≥ 0.2 mg/L had better TCR compliance rates than the Commonwealth (that is, had lower percentages of CWSs with TCR MCL violations). Some of these states were also able to maintain low rates of DBP violations as well.

A disinfectant residual serves as an indicator of distribution system contamination and the effectiveness of distribution system best management practices. Best management practices include flushing, storage tank maintenance, cross-connection control, leak detection, and effective pipe replacement and repair practices. The effective implementation of best management practices will help water suppliers comply with the disinfectant residual treatment

technique by lowering chlorine demand and maintaining an adequate disinfectant residual throughout the distribution system. These same practices also help to control DBP formation.

Water systems that have participated in the Department's Distribution System Optimization Program have shown great success in utilizing operational changes and other lower cost options to maintain simultaneous compliance with adequate disinfectant residual levels and DBPs. Below are several case studies from the program.

System A: This system serves 13,000 customers through 2,974 connections, uses free chlorine, has one standpipe, and a distribution system storage capacity of 1.25 million gallons.

- *Historical problems:* This system experienced an upward trend in Trihalomethane (THM) levels leading to drinking water locational running annual average (LRAA) MCL exceedances in two consecutive quarters and hydraulic dead-ends in portions of the distribution system requiring significant flushing to maintain a detectable residual.
- *Technical assistance efforts:* Department and system staff conducted in-plant water quality profiling (disinfectant residual, Total Organic Carbon, pH, DBPs), distribution system investigative sampling, in-tank water quality monitoring, and storage tank continuous disinfectant residual monitoring for one month.
- *Evaluation findings:* The evaluation found significant in-plant DBP formation, and high levels of THMs and low disinfectant residuals associated with stratification of standpipe.
- *Remedies:* The system decreased the pre-filtration chlorine feed rate to reduce in-plant THM formation resulting in a return to compliance with the LRAA MCL and increased the frequency and duration of routine distribution system flushing in problematic areas to maintain a minimum residual of 0.20 mg/L free chlorine. The system is currently evaluating the benefit of additional measures including the use of a mixing aeration system for the standpipe and automatic flushing units in problematic areas of the distribution system.

System B: This system serves 8,600 customers through 3,175 connections, uses chloramines for secondary disinfection, has two standpipes, three ground level tanks and a distribution system storage capacity of 4.755 million gallons.

- *Historical problems:* This system had difficulty maintaining a disinfectant residual throughout high and low-pressure zones.
- *Technical assistance efforts:* Department and system staff conducted a chloramine dosing and hold study, entry point hold study, distribution system investigative sampling, in-tank water quality monitoring, storage tank turnover analysis, and storage tank continuous disinfectant residual monitoring for one month.
- *Evaluation findings:* The evaluation found uneven chlorine dosing at the end of the sedimentation basin, poor control and monitoring of ammonia dosing prior to the entry point, highly reactive monochloramine residual degraded completely within 48 hours,

poor mixing performance and excessive storage tank turnover time (~15 days), trace disinfectant residual in both standpipes, and areas of non-detect monochloramine residual in both pressure zones.

- *Remedies:* The system developed a weir system to increase mixing at the chlorine dosing location in the sedimentation basins, began routine testing of ammonia strength and feed rates, began routine grab sample monitoring of free ammonia and monochloramine to achieve more precise ammonia dosing, increased flushing of problematic areas of the distribution system to maintain monochloramine residual of 1.0 mg/L, modified operations of storage tanks to decrease turnover time by ~50%, removed the standpipe from service to decrease excessive storage capacity by one million gallons, and began system-wide flushing of the distribution system in coordination with free chlorine burns in order to minimize transitional mixing zones. The system is currently evaluating the benefit of automatic flushing units in problematic areas of the distribution system.

System C: This system serves 6,000 customers through 2,900 connections, uses free chlorine, and has 2 ground level storage tanks.

- *Historical problems:* This system had difficulty maintaining a disinfectant residual throughout the distribution system.
- *Technical assistance efforts:* Department and system staff conducted distribution system investigative sampling.
- *Evaluation findings:* The evaluation found that extremities within the distribution system had free chlorine residuals <0.10 mg/L, and required significant flushing to maintain residuals >0.20 mg/L.
- *Remedies:* The system performed a flushing study to identify locations for installation of automatic flushing units and installed three automatic flushing units to create an artificial demand in areas of low disinfectant residuals.

System D: This system serves 7,800 customers through 4,382 connections, uses free chlorine, has 2 ground level storage tanks, and a distribution system storage capacity of 4.5 million gallons.

- *Historical problems:* This system had difficulty maintaining disinfectant residuals at the master meters of consecutive systems.
- *Technical assistance efforts:* Department and system staff conducted in-tank water quality monitoring, storage tank turnover analysis, and storage tank continuous disinfectant residual monitoring for one month.
- *Evaluation findings:* The evaluation found poor mixing performance and excessive storage tank turnover (15 – 22 days), and significant impact from storage tanks on disinfectant residuals in areas of influence.

- *Remedies:* The system modified operation of storage tanks to decrease turnover time and stratification as well as decrease degradation of disinfectant residuals.

System E: This system serves 25,500 customers through 9,300 connections, uses free chlorine, has five ground level storage tanks, one elevated tank and a distribution system storage capacity of 7.25 million gallons.

- *Historical problems:* This system had low disinfectant residuals at the master meter from the selling system, and had difficulty maintaining residuals in portions of the distribution system.
- *Technical assistance efforts:* Department and system staff conducted a master meter hold study, in-tank water quality monitoring, storage tank turnover analysis, and storage tank continuous disinfectant residual monitoring for one week.
- *Evaluation findings:* The evaluation found rapid degradation of free chlorine residual due to the purchase of chloraminated water at the master meter, poor mixing performance and excessive storage tank turnover (7 – 8 days), and significant impact of storage tanks on disinfectant residual in areas of influence.
- *Remedies:* The system increased communication with the selling system, modified its residual boosting strategy at the master meter and increased monitoring, and modified its operation of storage tanks to decrease turnover time and stratification as well as decrease degradation of disinfectant residual.

System F: This system serves 10,000 customers through 4,927 connections, uses free chlorine, has four ground level tanks, one elevated tank, and one stand pipe, and has a distribution system storage capacity of 3.2 million gallons.

- *Historical problems:* This system had difficulty maintaining disinfectant residuals throughout the distribution system during summer and early fall.
- *Technical assistance efforts:* Department and system staff conducted a storage tank turnover analysis and distribution system and storage tank continuous disinfectant residual monitoring for two weeks.
- *Evaluation findings:* The evaluation found significant impact from storage tanks on the disinfectant residual in areas of influence and that storage tank operations were based on plant production rather than distribution system water quality data.
- *Remedies:* The system increased water quality data collection in the distribution system, modified storage tank operation based on water quality data, and removed a storage tank from service to reduce total distribution system capacity.

System G: This system serves 33,000 customers through 15,000 connections, uses free chlorine, has four ground level storage tanks, one standpipe and has a distribution system storage capacity of six million gallons.

- *Historical problems:* This system had difficulty maintaining disinfectant residuals throughout the distribution system during summer and early fall.
- *Technical assistance efforts:* Department and system staff conducted a storage tank turnover analysis and storage tank continuous disinfectant residual monitoring for two weeks.
- *Evaluation findings:* The evaluation found poor mixing performance and excessive storage tank turnover time (~ 8 days).
- *Remedies:* The system installed mixing systems in storage tanks where stratification was observed to homogenize water quality.

System H: This system serves 18,000 customers through 8,200 connections, uses free chlorine, has three ground level storage tanks and one elevated tank, and has a distribution system storage capacity of 4.75 million gallons.

- *Historical problems:* This system had elevated THM and HAA levels.
- *Technical assistance efforts:* Department and system staff conducted a storage tank turnover analysis and storage tank continuous disinfectant residual monitoring at multiple locations over three months.
- *Evaluation findings:* The evaluation found significant impact from storage tanks on disinfectant residuals in areas of influence and poor mixing performance and excessive storage tank turnover time (6.2 – 12.5 days).
- *Remedies:* The system installed mixing systems in storage tanks where stratification was observed to homogenize water quality and modified storage tank operation to decrease turnover time.

Water suppliers can obtain more information about these distribution system assessment and optimization tools from the Department's website, using the keyword: Distribution System Optimization.

The Board requested comment on several aspects of the proposed rulemaking, including:

1. Additional studies and reports related to detection limits for free and total chlorine residual analysis in the field.

The Board received one study and the data were used to inform decisions about the minimum reporting level.

2. Studies, reports or data that support a disinfectant residual of 0.1 mg/L, or any other disinfectant residual that is equally protective of public health.

The Board received disinfectant residual and microbial data from six water systems. Here is a summary of the data:

System A: Large system; provided summary disinfectant residual data from 2004-2014; of the 36,500 samples analyzed, only ~3% of the samples were ≤ 0.15 mg/L total chlorine residual

System B: Large system; provided summary data for last five years; for the 14 total coliform positive samples reported, the disinfectant residual ranged from 0.02 – 1.35 mg/L, with an avg. = 0.67 mg/L

System C: Large system; uses chloramines; provided disinfectant residual and coliform data from 2008-2015; for the 2011-2015 time period, 7,363 disinfectant residual samples were analyzed with only 128 (1.7%) < 0.15 mg/L

System D: 33,000 disinfectant residual records were analyzed from 2013-2016; only 332 (or 1%) < 0.15 mg/L

System E: Medium system; provided a summary of free chlorine residual data for 2014-2015; in 2014, six dead end samples < 0.15 mg/L; in 2015, all results > 0.15 mg/L

System F: Large system; uses chloramines, provided 25,000 sample results from 2012-2016; 99.7% of samples ≥ 0.2 mg/L; only 0.3% of samples < 0.2 mg/L; 59 positive total coliform samples with no correlation between residual

To summarize, data from these medium and large water systems indicate that a very small percentage (0.3 – 3%) of these historical disinfectant residuals would not have met a disinfectant residual requirement of 0.15 – 0.2 mg/L. These systems are well-positioned to meet a disinfectant residual of 0.2 mg/L.

Finally, the Board did not receive any studies or reports that support an alternate disinfectant residual of 0.1 mg/L.

3. References to studies, reports or data that provide supporting evidence that an HPC < 500 provides an equivalent level of public health protection when compared to a disinfectant residual of 0.2 mg/L.

The Board received one reference to an unpublished draft document. However, the document was unavailable and could not be used. The Department is not aware of any other studies or reports that provide evidence that an HPC < 500 provides equivalent public health protection.

4. Anticipated costs to comply with the proposed disinfectant residual requirements.

The Board received cost information from four water systems. Cost information in the order and RAF were updated accordingly.

5. Whether a deferred effective date of six months after final promulgation is warranted in order to provide water systems with additional time to make any necessary operational changes. The anticipated length of time needed to increase disinfectant residuals and whether capital improvements are anticipated to meet the proposed requirements.

The Board received multiple comments on the need for deferred effective dates, and the dates were amended accordingly.

6. The compliance determination, especially for small systems.

The Board received several comments on the compliance determinations and all comments were taken into consideration.

The final-form rulemaking was presented to the TAC Board on July 13 and August 25, 2017. The TAC Board made nine recommendations, six of which were incorporated into this final-form rulemaking. Section E includes more information about the TAC Board's recommendations. The recommendation regarding averaging additional grab sample measurements from a sampling location will be included in Department guidance on system monitoring. Regarding the 2 remaining recommendations, one recommendation was to delay any new regulation update to Chapter 109 until the Safe Drinking Water Program is at full complement and current regulations are uniformly enforced. The Board is taking steps to provide the Department with additional funds through fee increases and believes that proceeding with this final-form rulemaking now is in the public interest because of the compelling public health benefits discussed in previous sections of this order. The remaining recommendation is for the Department to conduct a disinfection byproduct evaluation to determine the impacts of increasing the chlorine residual in the distribution system using data only from Pennsylvania water systems. The Department will continue to track and analyze TCR and DBP compliance rates as these amendments are implemented to determine whether simultaneous compliance is being achieved.

The Independent Regulatory Review Commission (IRRC) submitted several comments. To summarize, IRRC recommended the following:

1. The EQB should continue to work with the regulated community to develop a schedule for implementing this rule that adequately protects the health, safety, and welfare of the public, while at the same time, minimizing the fiscal impact it will have on water systems.

Response: The Department worked with TAC to develop an implementation plan for the final-form rulemaking. Most provisions will be deferred for one year following the effective date of the regulation. In addition, compliance schedules will be used to allow more time for capital improvements or to implement more complex operational changes.

2. In the final-form Preamble and Regulatory Analysis Form (RAF), the Board should provide specific estimates of all the costs associated with compliance and an explanation of how the estimates were derived. In addition, the Board should provide further explanation concerning the benefits of the regulation as compared to the costs.

Response: The Department has updated the cost information in this preamble/order and the RAF based on comments received. Updated information includes costs to the regulated community, as well as potential savings from the prevention of public health crises due to waterborne illnesses.

3. In the Preamble to the final-form regulation, the Board should explain the reasonableness of requiring weekly monitoring, and how the potential benefits outweigh any costs associated with it.

Response: After considerable discussion, the TAC Board issued final recommendations that the weekly monitoring frequency should be retained for two reasons: (1) weekly monitoring helps ensure continuous disinfection and improves public health protection, and (2) the collection of at least four samples per month allows a water system to have one sample below the minimum level and still be in compliance. If systems were to take fewer than four samples per month, any one sample below the minimum level would put the system out of compliance immediately. Finally, it was determined that weekly monitoring should not be a hardship because water system personnel are already on-site on a daily basis collecting daily entry point samples. These same personnel would be able to grab a weekly disinfectant residual sample within the distribution system.

4. In the Preamble to the final-form regulation, the Board should explain what specific public health issue is being addressed by the proposed disinfectant residual that is not currently being handled by the Revised Total Coliform Rule or isn't a premise plumbing concern. The Board should also explain what measures exist to safeguard against increases in DBPs.

Response: Based on an assessment of 5,434,000 samples, EPA found that a lower rate of both total coliform and fecal coliform/*E. coli* positives occurred as the free or total chlorine residual increased to higher levels. This relationship between chlorine residuals and occurrence of total coliform and fecal coliform/*E. coli* positives was similar to results reported by the Colorado Department of Public Health and Environment (Ingels, 2015). In addition, this relationship is consistent with the findings of LeChevallier et al. (1996) which stated that disinfectant residuals of 0.2 mg/L or more of free chlorine, or 0.5 mg/L or more of total chlorine, are associated with reduced levels of coliform bacteria. (Note: Both of these studies were previously discussed in the preamble to the proposed rule.) Based on this data, EPA determined that a detectable concentration of disinfectant residual in the distribution system may not be adequately protective of public health due to microbial pathogens. This is based on concerns about analytical methods and the potential for false positives (Wahman and Pressman, 2015). According to EPA, maintaining a disinfectant residual above a set numerical value in the distribution system may improve public health protection from a variety of pathogens.

Regarding the ability of water systems to increase disinfectant residual levels to 0.2 mg/L and still meet DBP limits, data from other states shows that simultaneous compliance can be achieved with both rules. In addition, several case studies were described in this order regarding systems that have participated in the Department's Distribution System

Optimization Program. These systems have been able to achieve simultaneous compliance by implementing operational changes and other lower cost measures.

The Department continues to believe that the large majority of systems will be able to achieve compliance with both rules because: (1) the large majority of systems already deliver water that meets disinfectant residual levels of ≥ 0.15 mg/L, and (2) for the remaining systems that do not currently meet a residual of ≥ 0.15 mg/L throughout the distribution system, many will be able to meet the requirement through operational changes or lower cost measures.

5. The fiscal analysis provided in the RAF indicates that the total estimated cost to the regulated community is \$823,500. The regulated community believes DEP has overestimated the number of water suppliers that would be in compliance with the proposed residual and has underestimated capital and operational costs. For example, Philadelphia Water estimated \$25 million dollars in capital costs and \$2.5 million dollars in annual operating and maintenance costs. The Borough of Carlisle estimates capital costs ranging from \$115,000 to \$190,000 to potentially comply with a 0.2 mg/L free chlorine requirement. As the Board develops the final-form regulation, we ask that they reach out to the regulated community to gain a better understanding of the potential costs associated with the new requirements and to include those revised costs in the RAF submitted with the regulatory package.

Response: The Department has updated the cost information in the order and RAF based on comments received.

6. In the Preamble to the final-form rulemaking, we ask the Board to explain why public notification is needed when the minimum disinfectant residual is not maintained in the distribution system and why the benefits of such a notice outweigh any potential costs associated with such notice.

Response: The Federal rule, 40 CFR 141.203(a), requires Tier 2 Public Notice (PN) for failure to meet the disinfectant residual treatment technique in the distribution system. Pennsylvania must be at least as stringent as the Federal rule. However, these amendments are not anticipated to substantially increase the number of Tier 2 PNs. A violation does not occur unless the water system fails to meet the minimum level in more than 5% of samples for two consecutive months. The Department would expect that most water systems will be able to make operational changes (i.e., increase flushing, etc.) after the first monthly failure and improve water quality ahead of the next monthly monitoring period. It should be the exception, not the norm, that water systems fail to meet the minimum level for two consecutive months.

7. We note that the Board has asked for comments with references to studies, reports or data comparing whether HPC less than 500 provides the same level of public health protection as a disinfectant residual of 0.2mg/L. In the Preamble to the final-form rulemaking, we ask the Board to explain its rationale for removing this provision. We will consider the Board's response to comments and any changes made to this subsection in our review of the final-form regulation to determine whether it is in the public interest.

Response: No references or studies were provided by the public. The Department has not found any studies that HPC is an equivalent standard when compared to a disinfectant residual level of 0.2 mg/L. The majority of states with disinfectant residual standards of 0.2 mg/L or greater do not use HPC as an ACC. For these reasons, the Department is not allowing the use of HPC for compliance purposes. However, water suppliers are encouraged to continue to use HPC as an operational parameter to help inform proper operation of distribution systems.

8. The Board states these revisions are in response to EPA comments to obtain primacy for Long Term 2 Enhanced Surface Water Treatment Rule. Water dispensing unit (WDU) operators commented that adding the HPC test alongside the Total Coliform test is duplicative and adds unnecessary costs. They further point out the drinking water standard for HPC is geared toward public water systems treating non-potable surface water or GUDI and that it should not apply to WDUs which receive already treated municipal water. We ask the Board to explain in the RAF and Preamble of the final-form regulation the reasonableness of requiring water dispensing units to meet the same disinfection residual requirements as public water systems.

Response: The EPA recognizes bulk water hauling and vended water systems as public water systems under the Safe Drinking Water Act and its regulations. Vended water systems that use purchased surface water must comply with the various surface water treatment rules. Systems using surface water must maintain a disinfectant residual in the water delivered to consumers. Since most vended water systems strip chlorine out of the water to improve taste, these systems are unable to comply with the Federal and state requirements. These systems generally retreat the water with ultraviolet (UV) or ozone, which do not provide a residual. Therefore, the only option for these systems is to monitor for and comply with the HPC alternative compliance criteria.

9. The EPA submitted comments that identify several instances where the Bottled Water and Vended Water Systems, Retail Water Facilities, and Bulk Water Hauling Systems (BVRB) monitoring provisions are inconsistent with Federal regulations and must be changed to obtain primacy. The EPA also seeks clarification on the BVRB entry point residual. We will review the Board's response to the EPA's comments and any changes made to this section in our review of the final-form rulemaking to determine whether it is in the public interest.

Response: Revisions have been made to ensure consistency with Federal rules and to maintain primary enforcement authority. Refer to Section E for more information about the revisions.

References

Colorado Department of Public Health and Environment (April 2014). "Draft—Minimum Distribution System Disinfectant Residuals: Chlorine Residual Values Reported from Within Drinking Water Distribution Systems."

DEP, Pennsylvania Drinking Water Information System online database.

EPA (December 2016). "Six-Year Review 3 Technical Support Document for Microbial Contaminant Regulations." EPA 810-R-16-010.

EPA, Enforcement and Compliance History Online database.

LeChevallier, M. W., et al. (1996). "Full-Scale Studies of Factors Related to Coliform Regrowth in Drinking Water." *Applied and Environmental Microbiology*, 62(7), p. 2201.

Wahman, D. G. and Pressman, J. G. (2015). "Distribution System Residuals—Is 'Detectable' Still Acceptable for Chloramines." *Journal—American Water Works Association*, 107(8), p. 53.

E. *Summary of Changes to the Proposed Rulemaking*

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

Clause (c)(1)(ii)(B) was edited for consistent use of the phrase “residual disinfectant concentration.”

Paragraph (c)(4) was renumbered as § 109.202(c)(6) and edited for consistent use of the phrase “residual disinfectant concentration.”

Paragraph (c)(5) was renumbered as § 109.202(c)(7) and edited for consistent use of the phrase “residual disinfectant concentration.”

The proposed revision to paragraph (d) was not included because it was codified in the Revised Total Coliform Rule (46 Pa.B. 6005 (September 24, 2016)).

§ 109.301. *General monitoring requirements*

Clause (1)(i)(D) was amended in response to public comments to clarify that the existing disinfectant residual requirements for filtered surface water and GUDI systems will remain in effect until one year after the effective date of this final-form regulation.

Clause (1)(i)(E) was added in response to public comments to defer the compliance date of the new disinfectant residual requirements until one year after the effective date of this final-form regulation.

Subclauses (1)(i)(E)(II)-(IV) were edited for consistent use of the phrase “residual disinfectant concentration.”

Subclause (1)(i)(E)(V) was added in response to TAC comments to allow the use of on-line analyzers for disinfectant residual monitoring and recording in the distribution system. On-line analyzers are permitted so long as the units are validated for accuracy.

Subparagraphs (1)(v) and (vi) were amended in response to public comments to clarify that water suppliers shall calculate the log inactivation at least once per day during expected peak hourly flow.

Clause (2)(i)(E) was amended in response to public comments to clarify that the existing disinfectant residual requirements for unfiltered surface water and GUDI systems will remain in effect until one year after the effective date of this final-form regulation.

Clause (2)(i)(F) was added in response to public comments to defer the compliance date of the new disinfectant residual requirements until one year after the effective date of this final-form rulemaking.

Subclauses (2)(i)(F)(II)-(IV) were edited for consistent use of the phrase “residual disinfectant concentration.”

Subclause (2)(i)(F)(V) was added in response to TAC comments to allow the use of on-line analyzers for disinfectant residual monitoring and recording in the distribution system. On-line analyzers are permitted so long as the units are validated for accuracy.

Clause (6)(vii)(D) was amended to correct a misspelled word.

Paragraph (13) was edited for consistent use of the phrase “residual disinfectant concentration” throughout the paragraph.

Clauses (13)(i)(A) and (B) were amended in response to public comments to defer the effective date of the new disinfectant residual requirements until one year after the effective date of this final-form regulation.

Clauses (13)(i)(A) – (C) were renumbered as §§ 109.301(13)(i)(B)(I) – (III).

Subclause (13)(i)(B)(I) was amended to correct a cross-reference.

Subclause (13)(i)(B)(IV) was added to clarify that compliance determinations will be made in accordance with § 109.710.

Subclause (13)(i)(B)(V) was added in response to TAC comments to allow the use of on-line analyzers for disinfectant residual monitoring and recording in the distribution system and to be consistent with §§ 109.301(1)(i)(E)(V) and 109.301(2)(i)(F)(V). On-line analyzers are permitted so long as the units are validated for accuracy.

§ 109.408. Tier 1 public notice—categories, timing and delivery of notice

Paragraph (a)(2) (relating to Tier 1 public notice—categories, timing and delivery of notice) was amended to correct a Chapter 109 cross-reference to include both subclause IV and V.

Subparagraph (a)(6)(iii) was amended for consistent use of the phrase “residual disinfectant concentration” and in response to public comments to clarify that Tier 1 public notice is required for a failure to maintain the minimum entry point disinfectant residual for more than four hours and either a failure to calculate the log inactivation, or a failure to meet the minimum log inactivation for more than four hours.

§ 109.701. Reporting and recordkeeping

Paragraph (a)(8) was amended to clarify and renumber the requirements relating to submission of the sample siting plan, for consistent use of the phrase “residual disinfectant concentration,” and incorporate comments from TAC to identify several items to be included in the sample siting plan including whether mixing zones exist, the system implements a free chlorine burn, and whether the system uses on-line analyzers. This section was also amended to add certain reporting requirements related to these sample siting plan items.

§ 109.710. Disinfectant residual in the distribution system

Paragraphs (a) and (b) were amended and (c) was added in response to public comments to defer the compliance date of the new disinfectant residual requirements until one year after the effective date of the final-form regulation.

Subparagraphs (c)(1)--(5) and (d)(1)—(5) were added in response to TAC comments to address measurements for mixing zones and free chlorine burns, and to clarify when free or total or both chlorine residual should be monitored.

Paragraphs (b)--(d) were renumbered as §§ 109.710(d) -- (f).

Paragraph (d) was amended for consistent use of the phrase “residual disinfectant concentration.”

Paragraph (e) was amended in response to TAC comments to allow additional monitoring to be included in the compliance calculations.

Subparagraphs (e)(1) and (2) were amended in response to TAC comments to allow additional monitoring to be included in the compliance calculations, to clarify that public water systems that use surface water or GUDI sources must comply with the federal and state treatment technique requirement of no more than 5% of samples out of compliance.

Subparagraphs (e)(3) and (4) were renumbered as §§ 109.710(e)(4) and (5) and a new subparagraph (e)(3) was added in response to TAC comments to clarify how compliance will be determined when both free and total disinfectant residual measurements are reported.

Subparagraph (e)(5) was amended to correct a cross-reference.

Subparagraph (e)(6) was added in response to TAC and public comments to clarify that the Department may approve an alternate compliance schedule if the water supplier submits a

written request with supporting documentation within one year of the effective date of this final-form regulation.

§ 109.716. Nitrification control plan

Section 109.715 was renumbered as § 109.716 because a new § 109.715 (relating to seasonal systems) was added by the Revised Total Coliform Rule (46 Pa.B. 6005 (September 24, 2016)).

Subsection 109.716(a) was amended in response to TAC comments to defer the compliance date of the nitrification control plan until one year after the effective date of this final-form regulation.

§ 109.1003. Monitoring requirements

Clause (a)(1)(ix)(A) was amended to cross-reference the monitoring requirements in 109.301(12)(ii) in response to EPA comments to be at least as stringent as the federal Stage 2 DBPR for bulk hauling, retail and vended water systems that meet the conditions of paragraph (D) or (E) (i.e. systems that meet the definition of a community or nontransient noncommunity water system).

Subclauses (a)(1)(ix)(C)(I) – (IV) were added in response to EPA comments to include language that is at least as stringent with the federal Stage 2 DBPR that identifies the MCL compliance calculations for total trihalomethanes (TTHM) and five haloacetic acid compounds (HAA5) to obtain primary enforcement authority for the Stage 2 DBPR.

Subparagraph (a)(1)(xi) was amended to revise the editor's note for this final-form rulemaking. This subparagraph was also amended and proposed clauses (a)(1)(xi)(A) – (C) were deleted in response to EPA comments to include language that is at least as stringent as the federal rule that identifies the MRDL compliance calculations for chlorine dioxide.

Subclause (a)(1)(xii)(B)(II) was amended to be consistent with existing language in § 109.301(12)(iv)(B)(II) that identifies the specific requirements to qualify for reduced bromate monitoring to be at least as stringent as the Federal Stage 2 DBPR.

Subparagraphs (a)(1)(xiii) and (xiv) were amended to revise the editor's notes for this final-form rulemaking, for consistent use of the phrase "residual disinfectant concentration," and in response to EPA comments that the entry point residual disinfectant concentration should be 0.20 mg/L be consistent with subparagraph (xiii) and § 109.202(c).

Subparagraph(a)(2)(iv) was amended to clarify when compliance is required based on the effective date of this final-form regulation.

Paragraph (b)(2) was amended in response to EPA comments that daily chlorite measurements may be conducted by a person meeting the requirements of § 109.1008(c) to be consistent with § 109.304(c).

Paragraphs (d) and (e) were amended in response to EPA comments for clarity to cross-reference the monitoring requirements in § 109.301 to be at least as stringent as the federal rules for bulk hauling, retail and vended water systems that meet the definition of a community or nontransient noncommunity water system.

§ 109.1008. System management responsibilities

Paragraphs (g) and (h) were renumbered as paragraphs (i) and (j) because new paragraphs (g) and (h) were added by the Revised Total Coliform Rule (46 Pa.B. 6005 (September 24, 2016)).

F. Benefits, Costs and Compliance

Benefits

The amendments will affect all 1,949 community water systems and those noncommunity water systems that have installed disinfection (746) for a total of 2,695 public water systems. These public water systems serve a total population of 11.3 million people.

The amendments are intended to reduce the public health risks and associated costs related to waterborne pathogens and waterborne disease outbreaks. Costs related to waterborne disease outbreaks are extremely high. In 2008, a large Salmonella outbreak caused by contamination of a storage tank and distribution system and no disinfectant residual within the municipal drinking water supply occurred in Alamosa, CO. The outbreak's estimated total cost to residents and businesses of Alamosa using a Monte Carlo simulation model (10,000 iterations) was approximately \$1.5 million (range: \$196,677—\$6,002,879) and rose to \$2.6 million (range: \$1,123,471—\$7,792,973) with the inclusion of outbreak response costs to local, state and nongovernmental agencies and City of Alamosa healthcare facilities and schools. This investigation documents the significant economic and health impacts associated with waterborne disease outbreaks and highlights the potential for loss of trust in public water systems following these outbreaks. See "Economic and Health Impacts Associated with a Salmonella Typhimurium Drinking Water Outbreak—Alamosa, CO, 2008," <http://www.ncbi.nlm.nih.gov/pubmed/23526942>.

Communities in this Commonwealth will benefit from: (1) the avoidance of a full range of health effects from the consumption of contaminated drinking water such as acute and chronic illness, endemic and epidemic disease, waterborne disease outbreaks, and death; (2) the continuity of a safe and adequate supply of potable water; and (3) the ability to plan and build future capacity for economic growth and ensure long-term sustainability.

Compliance Costs

Disinfectant residual monitoring at the entry point

It is estimated that 114 out of 352 plants (or ~ 30%) may be using paper chart recorders. Paper chart recorders can record measurements to two decimal places provided the proper scale and resolution is used. In cases where the requisite scale and resolution are not possible, an upgrade

to electronic recording devices would cost approximately \$1,500. It is estimated that 10% of these systems or 11 systems may need to upgrade to electronic recording devices. The estimated cost is 11 systems x \$1,500 = \$16,500.

This cost should not be prohibitive for filter plants, and the use of electronic devices offers several advantages. Advantages of using electronic recording devices include improved data reliability, faster and more comprehensive data analysis, better data resolution, elimination of the need for interpolating trace values from a chart, cost savings through the elimination of consumables (pens and chart paper), and reductions in errors associated with transferring analog data to a spreadsheet for recordkeeping or reporting purposes.

Disinfectant residuals in the distribution system

It is anticipated that the large majority of water systems will be able to comply with this requirement with little to no capital costs because many of these systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. Within the Commonwealth, 1,949 CWSs are required to provide and maintain disinfection treatment. Of these systems, 1,298 (67%) are required to collect only one disinfectant residual measurement each month. An additional 232 systems are only required to collect two measurements each month. In total, 1,530 systems (79%) are only required to collect one or two disinfectant residual measurements each month; which means the average result reported each month for the large majority of systems is essentially the same as the actual sample results.

The Department reviewed the summary data (distribution system disinfectant residual average result values) from Jan 2012-May 2017 for the 1,949 CWSs.

- During this period, 165,328 average result values were reported; of these records, 154,623 average result values (93.5%) were at or above 0.15 mg/L.
- For the systems that are required to conduct only one or two measurements each month, 136,743 average result values were reported; of these records, 126,406 average result values (92.4%) were at or above 0.15 mg/L.
- For the systems that only conduct one measurement each month, 116,900 average result values were reported; of these records, 107,366 (91.8%) were at or above 0.15 mg/L.

The below table shows the number of CWSs and the number of average result summary records submitted for each population group.

CWS Disinfectant Average Result by Population Category

Population Group	No. Samples Required	No. PWSs	Total POPL ¹	Total No. Records	No. Results < 0.15	No. Results ≥ 0.15
< 25 ²	1	9	172	300	14	286
25-1,000	1	1290	311,515	116,600	9,520	107,080
1,001-2,500	2	231	381,322	19,843	803	19,040
2,501-3,300	3	86	255,069	6,292	168	6,124
3,301-4,100	4	28	103,784	2,534	65	2,469
4,101-4,900	5	37	164,629	2,518	11	2,507
4,901-5,800	10	27	145,425	1,752	0	1,752
5,801-6,700	15	22	137,596	1,672	1	1,671
6,701-7,600	20	22	156,720	1,246	0	1,246
7,601-8,500	25	22	178,117	1,194	22	1,172
8,501-12,900	30	46	469,925	3,311	34	3,277
12,901-33,000	35	69	1,436,581	4,333	66	4,267
> 33,000	≥ 40	60	7,628,402	3,733	1	3,732
Total	---	1,949	11,369,257	165,328	10,705	154,623

¹Total POPL is the total population served for the population category, based on the CWS population in PADWIS. The Revised Total Coliform Rule required water systems to submit a revised sampling plan which included updated population numbers in accordance with existing EPA guidance. The CWS population served includes nontransient and transient consumers.

²These CWSs triggered applicability under the SDWA because each system provides water to 15 or more service connections.

An additional 621 noncommunity water systems with disinfection treatment are currently required to maintain a disinfectant residual in the distribution system. Of these 621 water systems, 598 (96%) are only required to collect one or two residual measurements each month; 554 (89%) are only required to conduct one measurement each month.

Therefore, the Department believes it is appropriate to use the average result data, and that the data indicate that most water systems are already in compliance with these minimum disinfection residual requirements.

Systems may need to increase the frequency of or improve the effectiveness of existing operation and maintenance best management practices, such as flushing, storage tank maintenance, cross-connection control, leak detection, and effective pipe replacement and repair practices, to lower chlorine demand and meet disinfectant residual requirements at all points in the distribution system.

Some systems with very large and extensive distribution systems may need to install automatic flushing devices, tank mixers or booster chlorination stations to achieve ≥ 0.15 mg/L (which rounds to 0.2 mg/L) at all points in the distribution system. As a result of public comments, the Department revised its capital expense estimates and added annual operational expense estimates as follows:

Type of Facility	Capital Expenses	Annual Expenses
Automatic flushing device	\$2,500	\$750
Tank mixer	\$75,000	
Booster chlorination station	\$250,000	\$10,000

It is estimated that 25% of community water systems serving over 25,000 people, or ~20 systems, may need to install automatic flushing devices, tank mixers or booster chlorination stations. Of these 20 systems:

- 12 water systems may need to install up to ten automatic flushing devices for capital costs of up to \$25,000 and annual expenses of up to \$7,500 per system. The total cost for 12 systems is estimated to be up to \$300,000 in capital costs and up to \$90,000 in annual expenses.
- Four water systems may need to install up to two tank mixers for capital costs of up to \$150,000 per system. The total cost for four systems is estimated to be up to \$600,000 in capital costs.
- Four systems may need to install up to four booster chlorination stations for capital costs of up to \$1,000,000 and annual expenses of up to \$40,000 per system. The total cost for four systems is estimated to be up to \$4,000,000 in capital costs and up to \$160,000 in annual expenses.

Costs for small systems are not expected to increase because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the Groundwater Rule. Further, with regard to operating costs, it is unlikely costs to small systems would increase because Section 109.304 specifies that certain parameters (including turbidity and disinfectant residuals) may be analyzed by an appropriately certified operator or a person using a standard operator procedure as specified in the Water and Wastewater Systems' Operator Certification Act. Small water systems that are required to install and maintain disinfection (under either the Surface Water Treatment Rule (SWTR) or the Groundwater Rule (GWR)) are currently required to measure the disinfectant residual at the entry point at least once per day, so a procedure is in place for conducting daily disinfectant residual measurements. The weekly distribution system measurements may be conducted by the same person.

Total estimated costs to the regulated community are as much as \$4,900,000 in capital costs and up to \$250,000 in annual operational expenses. Capital costs are one-time costs expected to be split over the first three years. Annual operational expenses are not expected to begin until year 2.

Estimate of Fiscal Savings and Costs						
	Current FY	FY +1	FY +2	FY +3	FY +4	FY +5
Savings:	\$	\$	\$	\$	\$	\$
Regulated community	0	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Local & state costs	0	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Total savings	0	2,600,000	2,600,000	2,600,000	2,600,000	2,600,000
Costs:		\$	\$	\$	\$	\$
Regulated community	0	1,630,000	1,880,000	1,880,000	250,000	250,000
Local & state costs	0	0	0	0	0	0
Total costs	0	1,630,000	1,880,000	1,880,000	250,000	250,000

However, these costs are offset by the avoidance of waterborne disease outbreaks. If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools.

Compliance Assistance Plan

The Safe Drinking Water Program utilizes the Commonwealth's Pennsylvania Infrastructure Investment Authority (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 Safe Drinking Water has staff dedicated to providing both training and outreach support services to public water system operators. The Department's web site also provides timely and useful information for treatment plant operators.

Finally, the Department also provides various tools and technical assistance to water systems through the Distribution System Optimization Program. The goal of distribution optimization is to sustain the water quality leaving the plant throughout all points in the distribution system. To further define distribution system optimization, "optimization" refers to improving drinking water quality to enhance public health protection without significant capital improvements to the water treatment plant or distribution system infrastructure.

The distribution system is the last "barrier" for protecting public health, meaning the physical and chemical barriers that have been established are necessary to protect the public from intentional or unintentional exposure to contaminants after the water has been treated. Distribution system optimization focuses on two primary health concerns related to water quality within the distribution system—microbial contamination and DBP formation.

If implemented, distribution system optimization will lead to increased public health protection through increased monitoring and operational oversight, resulting in improved physical protection and improved water quality for all customers.

Paperwork Requirements

Paperwork requirements include: electronic reporting of log inactivation values on a monthly basis using existing formats; electronic reporting of additional disinfectant residual levels measured in the distribution system using existing formats; development of a disinfectant residual sample siting plan; and development of a nitrification control plan.

G. Sunset Review

The Board is not establishing a sunset date for these regulations since they are needed for the Department to carry out its statutory authority. The Department will continue to closely monitor these regulations for their effectiveness and recommend updates to the Board as necessary.

H. Regulatory Review

Under section 5(a) of the Regulatory Review Act (71 P. S. § 745.5(a)), the Department submitted a copy of the proposed regulation and RAF to IRRC and to the Chairpersons of the House and Senate Environmental Resources and Energy Committees on the same date, February 11, 2016, that it submitted the proposed regulation to the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin*.

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 (71 P.S. § 745.5a(j.2)), 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.

I. 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 Pa. 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 46 Pa.B. 857 (February 20, 2016).

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

J. *Order of the Board*

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

(a) The regulations of the Department of Environmental Protection, 25 Pa. Code Chapter 109, are amended by amending §§ 109.1, 109.202, 109.301, 109.303, 109.408, 109.701, 109.710, 109.1002, 109.1003, 109.1004, 109.1008, 109.1103, 109.1107, 109.1202, 109.1302 and adding § 109.716 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 IRRC 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, as approved for legality and form, and deposit them with the Legislative Reference Bureau, as required by law.

(e) This order shall take effect immediately upon publication in the *Pennsylvania Bulletin*.

PATRICK McDONNELL,
Chairperson

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:

* * * * *

Consecutive water system—A public water system which obtains all of its water from another public water system and resells the water to a person, provides treatment to meet a primary MCL, MRDL or treatment technique, or provides drinking water to an interstate carrier. The term does not include bottled water and bulk water systems.

* * * * *

Subchapter B. MCLs, MRDLs OR TREATMENT TECHNIQUE REQUIREMENTS

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

(a) *Primary MCLs, MRDLs and treatment technique requirements.*

(1) A public water system shall supply drinking water that complies with the primary MCLs, MRDLs and treatment technique requirements adopted by the EQB under the act.

(2) This subchapter incorporates by reference the primary MCLs, MRDLs and treatment technique requirements in the National Primary Drinking Water Regulations[, at 40 CFR Part 141, Subparts B and G (relating to maximum contaminant levels)] 40 CFR Part 141 (relating to National Primary Drinking Water Regulations) as State MCLs, MRDLs and treatment technique requirements under authority of section 4 of the act (35 P. S. § 721.4), unless other MCLs, MRDLs and treatment technique requirements are established by regulations of the Department. The primary MCLs, MRDLs and treatment technique requirements which are incorporated by reference are effective on the date established by the Federal regulations.

* * * * *

(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 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.

* * * * *

[(ii) The combined total effect of disinfection processes utilized in a filtration plant shall achieve at least a 90% inactivation of *Giardia* cysts and a 99.9% inactivation of viruses, as determined by CTs and measurement methods established by the EPA. The residual disinfectant concentration in the water delivered to the distribution system prior to the first customer may not be less than .2 mg/L for more than 4 hours, as demonstrated by measurement taken under § 109.301(1). Failure to maintain this level that extends beyond 4 hours constitutes a breakdown in treatment. A system that experiences a breakdown in treatment shall, under § 109.701(a)(3) (relating to reporting and recordkeeping), notify the Department within 1 hour after the water system learns of the violation or the situation, and shall provide public notice in accordance with § 109.408 (relating to Tier 1 public notice categories, timing and delivery of notice).]

(ii) The combined total effect of disinfection processes utilized in a filtration plant shall:

(A) Achieve at least 1.0-log inactivation of *Giardia* cysts and 3.0-log inactivation of viruses as demonstrated by measurements taken under § 109.301(1). Failure to maintain the minimum log inactivation for more than 4 hours of operation constitutes a breakdown in treatment.

(B) Provide a minimum residual disinfectant concentration of 0.20 mg/L at the entry point as demonstrated by measurements taken under § 109.301(1). Failure to maintain the minimum entry point RESIDUAL disinfectant CONCENTRATION for more than 4 hours of operation is a treatment technique violation.

(iii) For an unfiltered surface water source permitted for use prior to March 25, 1989, the public water supplier shall:

* * * * *

(3) A community public water system shall provide continuous disinfection and comply with Subchapter M (relating to additional requirements for groundwater sources) for groundwater sources.

(4) Public water systems shall conduct assessments in accordance with § 109.705(b) (relating to system evaluations and assessments) after meeting any of the triggers under subparagraph (i) or (ii). Failure to conduct an assessment or complete a corrective action in accordance with § 109.705(b) is a treatment technique violation requiring 1-hour reporting in accordance with § 109.701(a)(3) and public notification in accordance with § 109.409 (relating to Tier 2 public notice—categories, timing and delivery of notice).

(i) A Level 1 assessment is triggered if any of the following conditions occur:

(A) For systems taking 40 samples or more per month under § 109.301(3), the system exceeds 5.0% total coliform-positive samples for the month.

(B) For systems taking fewer than 40 samples per month under § 109.301(3), the system has two or more total coliform-positive samples in the same month.

(C) The system fails to take every required check sample under § 109.301(3) after any single total coliform-positive sample.

(ii) A Level 2 assessment is triggered if any of the following conditions occur:

(A) A system fails to meet the *E. coli* MCL as specified under subsection (a)(2).

(B) A system triggers another Level 1 assessment, as defined in subparagraph (i), within a rolling 12-month period, unless the Department has determined a likely reason that the samples that caused the first Level 1 assessment were total coliform-positive and has established that the system has corrected the problem.

(5) Failure by a seasonal water system to complete the approved start-up procedure prior to serving water to the public as required under § 109.715 (relating to seasonal systems) is a treatment technique violation requiring 1-hour reporting in accordance with § 109.701(a)(3) and public notification in accordance with § 109.409.

(46) Community water systems using a chemical disinfectant or that deliver water that has been treated with a chemical disinfectant shall comply with the minimum RESIDUAL disinfectant CONCENTRATION specified in § 109.710 (relating to disinfectant residual in the distribution system).

(57) Nontransient noncommunity water systems that have installed chemical disinfection and transient noncommunity water systems that have installed chemical disinfection in accordance with paragraph (1) or § 109.1302(b) (relating to treatment technique

requirements) shall comply with the minimum RESIDUAL disinfectant CONCENTRATION specified in § 109.710.

* * * * *

(g) *Treatment technique requirements for disinfection byproduct precursors.* [Community] Community water systems and nontransient noncommunity water systems that use either surface water or GUDI sources and that use conventional filtration treatment shall provide adequate treatment to reliably control disinfection byproduct precursors in the source water. Enhanced coagulation and enhanced softening are deemed by the Department to be treatment techniques for the control of disinfection byproduct precursors in drinking water treatment and distribution systems. This subchapter incorporates by reference the treatment technique in 40 CFR 141.135 (relating to treatment technique for control of disinfection byproduct (DBP) precursors). Coagulants approved by the Department are deemed to be acceptable for the purpose of this treatment technique. This treatment technique is effective on the date established by the Federal regulations.

* * * * *

Subchapter C. MONITORING REQUIREMENTS

§ 109.301. General monitoring requirements.

Public water suppliers shall monitor for compliance with MCLs, MRDLs and treatment technique requirements in accordance with the requirements established by the EPA under the National Primary Drinking Water Regulations, 40 CFR Part 141 [(relating to National primary drinking water regulations)] (relating to 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:

(1) *Performance monitoring for filtration and disinfection.* A public water supplier providing filtration and disinfection of surface water or GUDI sources shall conduct the following performance monitoring requirements [established by the EPA under the National Primary Drinking Water Regulations], unless increased monitoring is required by the Department under § 109.302.

(i) Except as provided under subparagraphs (ii) and (iii) a public water supplier:

* * * * *

(C) Shall continuously monitor and record the residual disinfectant concentration of the water being supplied to the distribution system and record both the lowest value for each day and the

number of periods each day when the value is less than [.2] 0.20 mg/L for more than 4 hours. If a public water system's continuous monitoring or recording equipment fails, the public water supplier may, upon notification of the Department under § 109.701(a)(3) (relating to reporting and recordkeeping), substitute grab sampling or manual recording every 4 hours in lieu of continuous monitoring. Grab sampling or manual recording may not be substituted for continuous monitoring or recording for longer than 5 working days after the equipment fails.

(D) UNTIL _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR MINUS 1 DAY AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), SHALL ~~Shall~~ measure and record the residual disinfectant concentration at representative points in the distribution system {no less frequently than the frequency required for total coliform sampling for compliance with the MCL for microbiological contaminants.}

(E) BEGINNING _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), SHALL MEASURE AND RECORD THE RESIDUAL DISINFECTANT CONCENTRATION AT REPRESENTATIVE POINTS IN THE DISTRIBUTION SYSTEM in accordance with a sample siting plan as specified in § 109.701(a)(8) and as follows:

(I) A public water supplier shall monitor the residual disinfectant concentration at the same time and from the same location that a total coliform sample is collected as specified in paragraph (3)(i) and (ii). Measurements taken under this subclause may be used to meet the requirements under subclause (II).

(II) A public water supplier shall monitor the RESIDUAL disinfectant CONCENTRATION at representative locations in the distribution system at least once per week.

(III) A public water supplier that does not maintain the minimum RESIDUAL disinfectant CONCENTRATION specified in § 109.710 (relating to disinfectant residual in the distribution system) at one or more sample sites shall include those sample sites in the monitoring conducted the following month.

(IV) Compliance with the minimum RESIDUAL disinfectant CONCENTRATION shall be determined in accordance with § 109.710.

(V) A PUBLIC WATER SYSTEM MAY SUBSTITUTE ON-LINE RESIDUAL DISINFECTANT CONCENTRATION MONITORING AND RECORDING FOR GRAB SAMPLE MONITORING AND MANUAL RECORDING IF IT VALIDATES THE ON-LINE MEASUREMENT FOR ACCURACY IN ACCORDANCE WITH § 109.304.

(ii) For a public water supplier serving 3,300 or fewer people, the Department may reduce the residual disinfectant concentration monitoring for the water being supplied to the distribution system to a minimum of 2 hours between samples at the grab sampling frequencies prescribed as follows if the historical performance and operation of the system indicate the system can meet the residual disinfectant concentration at all times:

* * * * *

(iv) A public water supplier providing conventional filtration treatment or direct filtration and serving 10,000 or more people and using surface water or GUDI sources shall, beginning January 1, 2002, conduct continuous monitoring of turbidity for each individual filter using an approved method under the EPA regulation in 40 CFR 141.74(a) (relating to analytical and monitoring requirements) and record the results at least every 15 minutes. Beginning January 1, 2005, public water suppliers providing conventional or direct filtration and serving fewer than 10,000 people and using surface water or GUDI sources shall conduct continuous monitoring of turbidity for each individual filter using an approved method under the EPA regulation in 40 CFR 141.74(a) and record the results at least every 15 minutes.

* * * * *

(D) A public water supplier serving fewer than 10,000 persons has a maximum of 14 days following the failure of the equipment to repair or replace the equipment before a violation is incurred.

(v) A public water supplier shall calculate the log inactivation of Giardia, using measurement methods established by the EPA, at least once per day during EXPECTED peak hourly flow. The log inactivation for Giardia must also be calculated whenever the residual disinfectant concentration at the entry point falls below the minimum value specified in § 109.202(c) (relating to State MCLs, MRDLs and treatment technique requirements) and continue to be calculated every 4 hours until the residual disinfectant concentration at the entry point is at or above the minimum value specified in § 109.202(c). Records of log inactivation calculations must be reported to the Department in accordance with § 109.701(a)(2).

(vi) In addition to the requirements specified in subparagraph (v), a public water supplier that uses a disinfectant other than chlorine to achieve log inactivation shall calculate the log inactivation of viruses at least once per day during EXPECTED peak hourly flow. The log inactivation for viruses must also be calculated whenever the residual disinfectant concentration at the entry point falls below the minimum value specified in § 109.202(c) and continue to be calculated every 4 hours until the residual disinfectant concentration at the entry point is at or above the minimum value specified in § 109.202(c). Records of log inactivation calculations must be reported to the Department in accordance with § 109.701(a).

(2) *Performance monitoring for unfiltered surface water and GUDI.* A public water supplier using unfiltered surface water or GUDI sources shall conduct the following source water and performance monitoring requirements on an interim basis until filtration is provided, unless increased monitoring is required by the Department under § 109.302:

(i) Except as provided under subparagraphs (ii) and (iii), a public water supplier:

(A) Shall perform [fecal coliform] *E. coli* or total coliform density determinations on samples of the source water immediately prior to disinfection. Regardless of source water turbidity, the minimum frequency of sampling for [fecal or total coliform determination] total coliform or *E. coli* determinations may be no less than the following:

* * * * *

(E) UNTIL _____ (*EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR MINUS 1 DAY AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.*), SHALL Shall measure the residual disinfectant concentration at representative points in the distribution system {no less frequently than the frequency required for total coliform sampling for compliance with the MCL for microbiological contaminants.}

(F) BEGINNING _____ (*EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.*), SHALL MEASURE AND RECORD THE RESIDUAL DISINFECTANT CONCENTRATION AT REPRESENTATIVE POINTS IN THE DISTRIBUTION SYSTEM in accordance with a sample siting plan as specified in § 109.701(a)(8) and as follows:

(I) A public water supplier shall monitor the residual disinfectant concentration at the same time and from the same location that a total coliform sample is collected as specified in paragraph (3)(i) and (ii). Measurements taken under this subclause may be used to meet the requirements under subclause (II).

(II) A public water supplier shall monitor the RESIDUAL disinfectant CONCENTRATION at representative locations in the distribution system at least once per week.

(III) A public water supplier that does not maintain the minimum RESIDUAL disinfectant CONCENTRATION specified in § 109.710 at one or more sample sites shall include those sample sites in the monitoring conducted the following month.

(IV) Compliance with the minimum RESIDUAL disinfectant CONCENTRATION shall be determined in accordance with § 109.710.

(V) A PUBLIC WATER SYSTEM MAY SUBSTITUTE ON-LINE RESIDUAL DISINFECTANT CONCENTRATION MONITORING AND RECORDING FOR GRAB SAMPLE MONITORING AND MANUAL RECORDING IF IT VALIDATES THE ON-LINE MEASUREMENT FOR ACCURACY IN ACCORDANCE WITH § 109.304.

(ii) For a public water supplier serving 3,300 or fewer people, the Department may reduce the residual disinfectant concentration monitoring for the water being supplied to the distribution system to a minimum of 2 hours between samples at the grab sampling frequencies prescribed as follows if the historical performance and operation of the system indicate the system can meet the residual disinfectant concentration at all times:

* * * * *

(5) *Monitoring requirements for VOCs.* Community water systems and nontransient noncommunity water systems shall monitor for compliance with the MCLs for VOCs established by the EPA under 40 CFR 141.61(a) (relating to **[MCLs] maximum contaminant levels** for organic contaminants). The monitoring shall be conducted according to the requirements established by the EPA under 40 CFR 141.24(f) (relating to organic chemicals, sampling and analytical requirements), incorporated herein by reference, except as modified by this chapter. Initial or first year monitoring mentioned in this paragraph refers to VOC monitoring conducted on or after January 1, 1993.

* * * * *

(iii) *Repeat monitoring for entry points at which a VOC is detected.* For entry points at which a VOC is detected at a level equal to or greater than 0.0005 mg/L, then:

* * * * *

(B) The Department may decrease the quarterly monitoring requirement specified in clause (A) provided it has determined that the system is reliably and consistently below the MCL. **[The Department will not make this determination unless a groundwater or GUDI system takes a minimum of 2 quarterly samples and a surface water system takes a minimum of 4 quarterly samples.]** For an initial detection of a VOC, the Department will not make this determination until the water system obtains results from a minimum of four consecutive quarterly samples that are reliably and consistently below the MCL.

* * * * *

(6) *Monitoring requirements for SOCs (pesticides and PCBs).* Community water systems and nontransient noncommunity water systems shall monitor for compliance with the MCLs for SOCs established by the EPA under 40 CFR 141.61(c). The monitoring shall be conducted according to the requirements established by the EPA under 40 CFR 141.24(h), incorporated herein by reference except as modified by this chapter.

* * * * *

(ii) *Repeat monitoring for SOCs that are detected.* If an SOC is detected (as defined by the EPA under 40 CFR **[Part]** 141.24(h)(18) or by the Department), then:

* * * * *

(B) The Department may decrease the quarterly monitoring requirement specified in clause (A) provided it has determined that the system is reliably and consistently below the MCL. **[The Department will not make this determination unless a groundwater or GUDI system takes a minimum of 2 quarterly samples and a surface water system takes a minimum of 4 quarterly samples.]** For an initial detection of a SOC, the Department will not make this

determination until the water system obtains results from a minimum of four consecutive quarterly samples that are reliably and consistently below the MCL.

* * * * *

(vii) *Waivers.* A waiver will be granted to a public water supplier from conducting the initial compliance monitoring or repeat monitoring, or both, for an SOC based on documentation provided by the public water supplier and a determination by the Department that the criteria in clause (B), (C) or (D) has been met. A waiver is effective for one compliance period and may be renewed in each subsequent compliance period. If the Department has not granted a use waiver in accordance with clause (B), the public water supplier is responsible for submitting a waiver application and renewal application to the Department for review in accordance with clause (B) [or], (C) or (D) for specific entry points. Waiver applications will be evaluated relative to the vulnerability assessment area described in clause (A) and the criteria in clause (B) [or], (C) or (D). Entry points at which treatment has been installed to remove an SOC are not eligible for a monitoring waiver for the SOCs for which treatment has been installed.

(A) *Vulnerability assessment area for SOCs [except] including dioxin and PCBs.*

* * * * *

(D) ~~Waiver~~ **WAIVER requests and renewals.** Waiver requests and renewals shall be submitted to the Department, on forms provided by the Department, for review and approval prior to the end of the applicable monitoring period. Until the waiver request or renewal is approved, the public water system is responsible for conducting all required monitoring.

[(E) *Waivers for dioxin and PCBs.* A system is granted a waiver from monitoring for dioxin and PCBs unless the Department determines that there is a source of dioxin or PCB contamination which poses a threat to a drinking water source.]

(viii) *Invalidation of SOC samples.*

* * * * *

(7) *Monitoring requirements for IOCs.* Community water systems and nontransient noncommunity water systems shall monitor for compliance with the MCLs for IOCs established by the EPA under 40 CFR 141.62 (relating to maximum contaminant levels [(MCLs)] for inorganic contaminants). Transient noncommunity water suppliers shall monitor for compliance with the MCLs for nitrate and nitrite. The monitoring shall be conducted according to the requirements established by the EPA under 40 CFR 141.23 (relating to inorganic chemical sampling and analytical requirements). The requirements are incorporated by reference except as modified by this chapter.

(i) *Monitoring requirements for asbestos.*

[(A) *Waivers for asbestos monitoring.* A system is granted a waiver from asbestos monitoring unless the Department determines that the system's distribution system contains asbestos cement pipe and the system has not implemented optimum corrosion control measures, or the Department determines that the system's source water is vulnerable to asbestos contamination.

(B) *Initial monitoring schedule.* **(A) *Monitoring frequency.*** Community water systems and nontransient noncommunity water systems not granted a waiver under clause **[(A)] (F)** shall monitor for compliance with the MCL for asbestos by taking one sample at each vulnerable sampling point during the first 3-year compliance period of each 9-year compliance cycle, with the initial compliance monitoring beginning not later than the calendar year beginning January 1, 1995.

(B) *Sampling points.* A system shall monitor at the following locations:

(I) Each entry point to the distribution system.

(II) At least one representative location within the distribution system identified in a written sample site plan that includes a materials evaluation of the distribution system. The written sample site plan must be maintained on record and submitted to the Department prior to conducting initial monitoring or upon request.

(C) *Monitoring of new entry points.* New entry points which begin operation after December 31, 1995, shall conduct initial monitoring during the first compliance period of the first compliance cycle after the entry point begins serving the public, if the Department determines that a waiver cannot be granted in accordance with clause **[(A)] (F)**.

(D) *Repeat monitoring for systems that exceed the asbestos MCL.* If a sample exceeds the MCL for asbestos, the monitoring at that sampling point shall be continued quarterly beginning in the quarter following the MCL **[violation] exceedance**. After **[4] four** consecutive quarterly samples with results reliably and consistently below the MCL at that entry point, the required monitoring is reduced to one sample at that entry point during the first 3-year compliance period of each subsequent 9-year compliance cycle, if treatment has not been installed to remove asbestos from the source water. Compliance monitoring at entry points at which treatment has been installed to remove asbestos from source water shall be conducted at least annually, and performance monitoring shall be conducted quarterly.

(E) *Confirmation samples.* For asbestos sample results in excess of the MCL during annual or less frequent compliance monitoring, the water supplier shall take a confirmation sample within 2 weeks of notification by the accredited laboratory performing the analysis. The average of the results of the original and the confirmation sample will be used to determine compliance. Monitoring shall be completed by the deadline specified for asbestos compliance monitoring.

(F) *Waivers for asbestos monitoring.* A waiver will be granted to a public water supplier from conducting compliance monitoring for asbestos based on documentation provided by the public water supplier and a determination by the Department that the criteria in this

clause have been met. A waiver is effective for one compliance period and may be renewed in each subsequent compliance period. Entry points at which treatment has been installed to remove asbestos are not eligible for a monitoring waiver.

(I) A waiver for entry point compliance monitoring may be granted if the sources supplying the entry point are not vulnerable to asbestos contamination.

(II) A waiver for distribution system monitoring may be granted if the distribution system does not contain asbestos cement pipe as indicated in the materials evaluation or if the water system has optimized corrosion control as specified in Subchapter K (relating to lead and copper).

(III) Waiver requests and renewals shall be submitted to the Department, on forms provided by the Department, for review and approval prior to the end of the applicable monitoring period. Until the waiver request or renewal is approved, the public water system is responsible for conducting all required monitoring.

(ii) *Monitoring requirements for nitrate and nitrite.*

* * * * *

(iii) *Monitoring requirements for antimony, arsenic, barium, beryllium, cadmium, cyanide, chromium, fluoride, mercury, nickel, selenium and thallium.*

* * * * *

(C) *Repeat monitoring for entry points at which an IOC MCL is exceeded.*

* * * * *

(II) After analyses of [4] four consecutive quarterly samples [at an entry point where treatment has not been installed to comply with an IOC MCL] indicate that contaminant levels are reliably and consistently below the MCLs, the required monitoring at an entry point where treatment has not been installed to comply with an IOC MCL for each IOC that is reliably and consistently below the MCL is reduced to the frequencies stated in clause (A). This reduced monitoring option does not apply to entry points at which treatment has been installed for IOC removal. Compliance monitoring for IOCs for which treatment has been installed to comply with an MCL shall be conducted at least annually, and performance monitoring shall be conducted quarterly.

* * * * *

(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 TTHM 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 TTHM, 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.

* * * * *

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

* * * * *

(B) *Reduced monitoring.*

* * * * *

(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) **analyzed using methods specified in 40 CFR 141.132(b)(3)(ii)(B)** 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 **analyzed using methods specified in 40 CFR 141.132(b)(3)(ii)(B)** 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).

* * * * *

(13) *Monitoring requirements for disinfectant residuals.* Community water systems and nontransient noncommunity water systems that use either chlorine[,] or chloramines or [chlorine dioxide] that obtain finished water from another public water system that uses either chlorine or chloramines, and transient noncommunity water systems that install chemical disinfection treatment in accordance with § 109.1302(b) (relating to treatment technique requirements) shall monitor for RESIDUAL disinfectant CONCENTRATION in accordance with this paragraph. Community water systems [and], nontransient noncommunity water systems [that obtain finished water from another public water system that uses either

chlorine or] and transient noncommunity water systems that use chlorine dioxide to treat the finished water shall monitor for chlorine [residual] dioxide in accordance with this paragraph. [Community water systems and nontransient noncommunity water systems that obtain finished water from another public water system that uses chloramines to treat the finished water shall monitor for chloramine residual in accordance with this paragraph. Transient noncommunity water systems that use chlorine dioxide as either a disinfectant or oxidant shall monitor for chlorine dioxide residual 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 RESIDUAL disinfectant CONCENTRATION shall take all samples during normal operating conditions. Compliance with the MRDLs and monitoring requirements for chlorine, chloramines and chlorine dioxide (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. Compliance with the minimum RESIDUAL disinfectant CONCENTRATION shall be determined in accordance with § 109.710.

(i) *Chlorine and chloramines.*

(A) UNTIL _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR MINUS 1 DAY AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), SYSTEMS Systems shall measure the residual disinfectant level {at the same points in the distribution system and at the same time that total coliforms are sampled, as specified in paragraph (3). Systems that used either surface water or GUDI sources may use the results of residual disinfectant concentration sampling conducted under paragraph (1) or (2) in lieu of taking separate samples.}

(B) BEGINNING _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), SYSTEMS SHALL MEASURE THE RESIDUAL DISINFECTANT CONCENTRATION in accordance with a sample siting plan as specified in § 109.701(a)(8) and as follows:

(AI) Public water systems shall monitor the residual disinfectant concentration at the same time and from the same location that a total coliform sample is collected as specified in paragraph (3)(i) and (ii). Systems that use either surface water or GUDI sources may use the results of residual disinfectant concentration sampling conducted under paragraph (1) or (2) instead of taking separate samples. Measurements taken under this clause may be used to meet the requirements under SUBCLAUSE (II) elause-(B).

(BII) Public water systems shall monitor the RESIDUAL disinfectant CONCENTRATION at representative locations in the distribution system at least once per week.

(€III) A public water system that does not maintain the minimum RESIDUAL disinfectant CONCENTRATION specified in § 109.710 at one or more sample sites shall include those sample sites in the monitoring conducted the following month.

(IV) COMPLIANCE WITH THE MINIMUM RESIDUAL DISINFECTANT CONCENTRATION SHALL BE DETERMINED IN ACCORDANCE WITH § 109.710.

(V) A PUBLIC WATER SYSTEM MAY SUBSTITUTE ON-LINE RESIDUAL DISINFECTANT CONCENTRATION MONITORING AND RECORDING FOR GRAB SAMPLE MONITORING AND MANUAL RECORDING IF IT VALIDATES THE ON-LINE MEASUREMENT FOR ACCURACY IN ACCORDANCE WITH § 109.304.

(ii) Chlorine dioxide.

* * * * *

§ 109.303. Sampling requirements.

* * * * *

(e) Compliance monitoring samples for the contaminants listed under 40 CFR [141.40(n)] 141.40(a), 141.61(a) and (c), 141.62 and 141.88 may be composited in accordance with 40 CFR 141.23(a)(4), 141.24(f)(14)], (g)(7)] and (h)(10) and 141.88(a)(1)(iv) (relating to inorganic chemical sampling and analytical requirements; organic chemicals [other than total trihalomethanes], sampling and analytical requirements; and monitoring requirements for lead and copper in source water) except:

* * * * *

Subchapter D. PUBLIC NOTIFICATION

§ 109.408. Tier 1 public notice—categories, timing and delivery of notice.

(a) *General violation categories and other situations requiring a Tier 1 public notice.* A public water supplier shall provide Tier 1 public notice for the following circumstances:

* * * * *

(2) Violation of the MCL for nitrate, nitrite or total nitrate and nitrite, as defined in § 109.202(a)(2), or when the water supplier fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in [§ 109.301(7)(ii)(C)(V)] § 109.301(7)(ii)(C)(IV)-(V).

* * * * *

(6) Violation of a treatment technique requirement for pathogenic bacteria, viruses and protozoan cysts as defined in § 109.202(c), resulting from [a]:

(i) A single exceedance of the maximum allowable turbidity limit.

(ii) A failure to meet the minimum log inactivation for more than 4 hours.

(iii) A failure to maintain the minimum entry point RESIDUAL disinfectant CONCENTRATION for more than 4 hours and EITHER OF THE FOLLOWING: a failure to calculate the log inactivation in accordance with § 109.301(1)(v) and (vi).

(A) A FAILURE TO CALCULATE THE LOG INACTIVATION IN ACCORDANCE WITH § 109.301(1)(v) AND (vi).

(B) A FAILURE TO MEET THE MINIMUM LOG INACTIVATION FOR MORE THAN 4 HOURS.

(7) Violation of a treatment technique requirement for *Cryptosporidium* as defined in § 109.1203 (relating to bin classification and treatment technique requirements), resulting from a failure to provide the level of treatment appropriate for the systems bin classification.

* * * * *

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:

* * * * *

(2) *Monthly reporting requirements for performance monitoring.* In addition to the reporting requirements specified in paragraph (1), public water systems shall report performance monitoring data as follows:

(i) The test results of performance monitoring required under § 109.301(1) (relating to general monitoring requirements) for public water suppliers providing filtration and disinfection of surface water or GUDI sources must include the following at a minimum:

* * * * *

(B) For performance monitoring of the residual disinfectant concentration of the water being supplied to the distribution system:

(I) The date, time and lowest value each day the residual disinfectant concentration remains equal to or greater than the required minimum.

(II) The initial date, time and value for each occurrence that the residual disinfectant concentration is less than the required minimum, and the subsequent date, time and value that the residual disinfectant concentration is equal to or greater than the required minimum.

(III) The date the entry point is not in operation.

[(C) For performance monitoring of the residual disinfectant concentration at representative points in the distribution system report the following:

(I) The number of monthly routine samples required.

(II) The number of monthly routine samples collected and analyzed.

(III) The number of samples in which the residual disinfectant concentration was less than 0.02 mg/L.

(IV) For samples in which the residual disinfectant concentration was less than 0.02 mg/L: the date, time and value of each sample.]

(C) For performance monitoring of the log inactivation for Giardia, public water systems shall report as follows:

(I) The date, time and lowest log inactivation value for each day the value remains equal to or greater than the required minimum.

(II) The initial date, time and value for each occurrence that the log inactivation is less than the required minimum, and the subsequent date, time and value that the log inactivation is equal to or greater than the required minimum.

(III) The date the entry point is not in operation.

(D) For performance monitoring of the log inactivation for viruses, public water systems using a disinfectant other than chlorine to achieve log inactivation of viruses shall report as follows:

(I) The date, time and lowest log inactivation value for each day the value remains equal to or greater than the required minimum.

(II) The initial date, time and value for each occurrence that the log inactivation is less than the required minimum, and the subsequent date, time and value that the log inactivation is equal to or greater than the required minimum.

(III) The date the entry point is not in operation.

(ii) The test results of performance monitoring required under § 109.301(2) for public water suppliers using unfiltered surface water or GUDI sources shall include the following, at a minimum:

* * * * *

(B) For performance monitoring of the residual disinfectant concentration of the water being supplied to the distribution system:

(I) The date, time and lowest value each day the concentration is less than the residual disinfectant concentration required under § 109.202(c)(1)(iii) (**relating to State MCLs, MRDLs and treatment technique requirements**).

(II) If the concentration does not fall below that required under § 109.202(c)(1)(iii) during the month, report the date, time and lowest value measured that month.

[(C) For performance monitoring of the residual disinfectant concentration at representative points in the distribution system, report the following:

(I) The number of monthly routine samples required.

(II) The number of monthly routine samples collected and analyzed.

(III) The number of samples in which the residual disinfectant concentration was less than 0.02 mg/L.

(IV) For samples in which the residual disinfectant concentration was less than 0.02 mg/L: the date, time and value of each sample.

(D)] (C) For performance monitoring of the [fecal coliform] *E. coli* or total coliform density determinations on samples of the source water immediately prior to disinfection: the date, time and value of each sample.

(iii) The test results from performance monitoring required under § 109.301(8)(v) of the residual disinfectant concentration of the water in the distribution system shall include the date, time and value of each sample.

[(iv) The test results of heterotrophic plate count measurements taken under § 109.710(b) (relating to disinfectant residual in the distribution system) shall include the date, time and value of each sample.]

(3) *One-hour reporting requirements.* A public water supplier shall report the circumstances to the Department within 1 hour of discovery for the following violations or situations:

* * * * *

(7) *Form.* Reports required by this chapter shall be submitted in a manner or form acceptable to the Department.

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

(i) Systems monitoring for chlorine dioxide under § 109.301(13) shall report the number of days chlorine dioxide was used at each entry point during the last month.

(ii) Systems monitoring for either chlorine or chloramines under § 109.301(13) shall report the following:

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

(B) The arithmetic average of all distribution samples taken in the last month.]

~~(8) *Reporting requirements for disinfectant residuals.* In addition to the reporting requirements specified in paragraph (1), public water systems monitoring for disinfectant residuals under § 109.301 shall submit to the Department a written sample siting plan by _____ (Editor's Note: The blank refers to 6 months after the effective date of adoption of this proposed rulemaking.). A public water system that begins operation after _____ (Editor's Note: The blank refers to the effective date of adoption of this proposed rulemaking.), shall submit the sample siting plan prior to serving water to the public. At a minimum, the sample siting plan must include the following:~~

(i) SUBMIT TO THE DEPARTMENT A WRITTEN SAMPLE SITING PLAN BY _____ (EDITOR'S NOTE: THE BLANK REFERS TO 6 MONTHS AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.). A PUBLIC WATER SYSTEM THAT BEGINS OPERATION AFTER _____ (EDITOR'S NOTE: THE BLANK REFERS TO THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), SHALL SUBMIT THE SAMPLE SITING PLAN PRIOR TO SERVING WATER TO THE PUBLIC. THE SAMPLE SITING PLAN FOR DISINFECTANT RESIDUALS MAY BE COMBINED WITH THE SAMPLE SITING PLAN FOR COLIFORMS SPECIFIED IN PARAGRAPH (5) OF THIS SUBSECTION IF ALL CONTENT ELEMENTS ARE INCLUDED. AT A MINIMUM, THE SAMPLE SITING PLAN MUST INCLUDE THE FOLLOWING:

(iA) A list of representative sample site locations in the distribution system to be used for RESIDUAL disinfectant CONCENTRATION monitoring. Representative locations include, but are not limited to, the following:

(AI) Dead ends.

(BII) First service connection.

(€III) Finished water storage facilities.

(ØIV) Interconnections with other public water systems.

(ÆV) Areas of high water age.

(FVI) Areas with previous coliform detections.

(VII) MIXING ZONES FOR SYSTEMS USING CHLORINE AND PURCHASING WATER FROM A SYSTEM USING CHLORAMINES OR FOR SYSTEMS USING CHLORAMINES AND PURCHASING WATER FROM A SYSTEM USING CHLORINE.

(ÏB) Whether the sample site location is also used as a coliform, disinfection byproducts, or lead and copper sampling location.

(C) WHETHER THE SAMPLE SITE LOCATION IS LOCATED WITHIN A MIXING ZONE.

(D) WHETHER ON-LINE MONITORING AND RECORDING WILL BE SUBSTITUTED FOR GRAB SAMPLE MEASUREMENTS AT THE SAMPLE SITE LOCATION AND THE FREQUENCY OF MEASUREMENTS BY THE ON-LINE ANALYZER.

(E) A SAMPLE COLLECTION SCHEDULE.

(ii) ~~A water supplier shall revise and resubmit its~~ SUBMIT TO THE DEPARTMENT A REVISED sample siting plan within 30 days of notification by the Department that a sample siting plan fails to meet the criteria in CLAUSES A-E subparagraphs (i) and (ii).

(iii) ~~The water supplier shall notify~~ NOTIFY the Department of subsequent revisions to a sample siting plan as they occur. Revisions to a sample siting plan shall be submitted in written form to the Department within 30 days of notifying the Department of the revisions.

(IV) REPORT TO THE DEPARTMENT THE BEGINNING AND ENDING DATES WHEN A FREE CHLORINE BURN IS CONDUCTED FOR A SYSTEM USING CHLORAMINES.

(V) REPORT TO THE DEPARTMENT A DAILY AVERAGE IF ON-LINE MONITORING AND RECORDING IS SUBSTITUTED FOR GRAB SAMPLE MEASUREMENTS.

(9) *Level 1 and Level 2 assessments.* A public water supplier shall:

(i) Submit an assessment form completed in accordance with § 109.705(b) (relating to system evaluations and assessments) to the Department within 30 days after the system learns that it has exceeded a trigger under § 109.202(c)(4).

(ii) Submit a revised assessment form in accordance with § 109.705(b) within 30 days of notification from the Department that revisions are necessary.

* * * * *

§ 109.710. Disinfectant residual in the distribution system.

(a) UNTIL _____ (*EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR MINUS 1 DAY AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.*), ~~A community water system using a chemical disinfectant or that delivers water that has been treated with a chemical disinfectant shall maintain a minimum~~ A disinfectant residual {acceptable to the Department shall be maintained} throughout the distribution system {of the community water system} sufficient to assure compliance with the microbiological MCLs and the treatment technique requirements specified in § 109.202 (relating to State MCLs, MRDLs and treatment technique requirements). {The Department will determine the acceptable residual of the disinfectant considering factors such as type and form of disinfectant, temperature and pH of the water, and other characteristics of the water system.} ~~The minimum disinfectant residual is 0.2 mg/L measured as free chlorine for systems using chlorine, 0.2 mg/L measured as total chlorine for systems using chloramines or another level approved by the Department for systems using an alternate oxidizing disinfection treatment.~~

{(b) UNTIL _____ (*EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR MINUS 1 DAY AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.*), Aa public water system that uses surface water or GUDI sources or obtains finished water from another permitted public water system using surface water or GUDI sources shall comply with the following requirements:

(1) As a minimum, a detectable residual disinfectant concentration of 0.02 mg/L measured as total chlorine, combined chlorine or chlorine dioxide shall be maintained throughout the distribution system as demonstrated by monitoring conducted under § 109.301(1) and (2) or (8)(v) (relating to general monitoring requirements).

(2) Sampling points with nondetectable disinfectant residuals which have heterotrophic plate count (HPC) measurements of less than 500/ml are deemed to be in compliance with paragraph (1).

(3) When the requirements of paragraph (1) or (2) cannot be achieved, the supplier shall initiate an investigation under the Department's direction to determine the cause, potential health risks and appropriate remedial measures.}

(c) BEGINNING _____ (*EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.*), A

COMMUNITY WATER SYSTEM USING A CHEMICAL DISINFECTANT OR THAT DELIVERS WATER THAT HAS BEEN TREATED WITH A CHEMICAL DISINFECTANT SHALL MAINTAIN A MINIMUM RESIDUAL DISINFECTANT CONCENTRATION THROUGHOUT THE DISTRIBUTION SYSTEM SUFFICIENT TO ASSURE COMPLIANCE WITH THE MICROBIOLOGICAL MCLS AND THE TREATMENT TECHNIQUE REQUIREMENTS SPECIFIED IN § 109.202 (RELATING TO STATE MCLS, MRDLS AND TREATMENT TECHNIQUE REQUIREMENTS). THE MINIMUM RESIDUAL DISINFECTANT CONCENTRATION IS 0.2 MG/L OR ANOTHER LEVEL APPROVED BY THE DEPARTMENT FOR SYSTEMS USING AN ALTERNATE OXIDIZING DISINFECTION TREATMENT. THE RESIDUAL DISINFECTANT CONCENTRATION SHALL BE MEASURED AS FOLLOWS:

- (1) FREE CHLORINE FOR SYSTEMS USING CHLORINE.**
- (2) TOTAL CHLORINE FOR SYSTEMS USING CHLORAMINES.**
- (3) BOTH FREE CHLORINE AND TOTAL CHLORINE FOR SAMPLING LOCATIONS IN A MIXING ZONE AS IDENTIFIED IN THE MONITORING PLAN.**
- (4) BOTH FREE CHLORINE AND TOTAL CHLORINE WHEN A SYSTEM USING CHLORAMINES IS CONDUCTING A FREE CHLORINE BURN.**

(bD) BEGINNING _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), AA nontransient noncommunity water system that has installed chemical disinfection or a transient noncommunity water system that has installed chemical disinfection in accordance with § 109.202(c)(1) or § 109.1302(b) (relating to treatment technique requirements) shall maintain a minimum RESIDUAL disinfectant CONCENTRATION throughout the distribution system sufficient to assure compliance with the microbiological MCLs and the treatment technique requirements specified in § 109.202. The minimum RESIDUAL disinfectant CONCENTRATION is 0.2 mg/L ~~measured as free chlorine for systems using chlorine, 0.2 mg/L measured as total chlorine for systems using chloramines~~ or another level approved by the Department for systems using an alternate oxidizing disinfection treatment. THE RESIDUAL DISINFECTANT CONCENTRATION SHALL BE MEASURED AS FOLLOWS:

- (1) FREE CHLORINE FOR SYSTEMS USING CHLORINE.**
- (2) TOTAL CHLORINE FOR SYSTEMS USING CHLORAMINES.**
- (3) BOTH FREE CHLORINE AND TOTAL CHLORINE FOR SAMPLING LOCATIONS IN A MIXING ZONE AS IDENTIFIED IN THE MONITORING PLAN.**

(4) BOTH FREE CHLORINE AND TOTAL CHLORINE WHEN A SYSTEM USING CHLORAMINES IS CONDUCTING A FREE CHLORINE BURN.

(eE) BEGINNING _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.), Compliance compliance with the disinfectant residual treatment technique will be based on THE NUMBER OF samples collected EACH MONTH as specified in the system distribution sample siting plan submitted to the Department under § 109.701(a)(8) (relating to reporting and recordkeeping). Compliance will be determined as follows:

(1) For a public water system that COLLECTS LESS THAN 40 SAMPLE PER MONTH AND USES ONLY GROUNDWATER OR PURCHASED GROUNDWATER SOURCES, if no more than 1 sample collected per month is less than the minimum level specified in subsection (c) or (d) for 2 consecutive months, the system is in compliance with the treatment technique.

(2) For a public water system that COLLECTS 40 OR MORE SAMPLES PER MONTH OR THAT USES SURFACE WATER, GUDI, PURCHASED SURFACE WATER, OR PURCHASED GUDI SOURCES, if no more than 5% of the samples collected per month are less than the minimum level specified in subsection (c) or (d) for 2 consecutive months, the system is in compliance with the treatment technique.

(3) FOR SYSTEMS REPORTING BOTH FREE AND TOTAL CHLORINE RESIDUAL MEASUREMENTS IN ACCORDANCE WITH SUBSECTIONS (C) AND (D), COMPLIANCE SHALL BE BASED ON THE HIGHER RESIDUAL MEASUREMENT.

(34) A public water system that experiences a treatment technique violation shall notify the Department within 1 hour of discovery of the violation in accordance with § 109.701(a)(3) and issue a Tier 2 public notice in accordance with § 109.409 (relating to Tier 2 public notice—categories, timing and delivery of notice).

(5) In addition to the requirements in paragraphs (1)—(3) PARAGRAPHS (1)—(4), a public water system that fails to meet the minimum level specified in subsection (c) or (d) at any sample location for 2 consecutive months or more shall conduct an investigation to determine the cause and appropriate corrective actions and shall submit a written report to the Department within 60 days.

(6) THE DEPARTMENT MAY APPROVE IN WRITING AN ALTERNATE COMPLIANCE SCHEDULE IF THE WATER SUPPLIER SUBMITS A WRITTEN REQUEST WITH SUPPORTING DOCUMENTATION BY _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.).

[(c)] (d)(F) Public water systems may increase residual chlorine or chloramine, but not chlorine dioxide, disinfectant levels in the distribution system to a level that exceeds the MRDL for that disinfectant and for a time necessary to protect public health or to address specific

microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm runoff events, source water contamination events or cross-connection events.

(Editor's Note: The following section is new and printed in regular type to enhance readability.)

§ 109.715716. Nitrification control plan.

(a) A public water system that uses chloramines or purchases water that contains chloramines shall develop **A NITRIFICATION CONTROL PLAN BY _____ (EDITOR'S NOTE: THE BLANK REFERS TO 1 YEAR AFTER THE EFFECTIVE DATE OF THIS FINAL-FORM REGULATION.)**. The plan must conform to the guidelines in industry standards such as the American Water Works Association's M56 Manual on Nitrification and contain at least the following information:

(1) A system-specific monitoring plan that includes, at a minimum:

(i) The list of parameters that will be monitored such as pH, free ammonia, total chlorine, monochloramine, HPC, nitrite and nitrate.

(ii) The monitoring locations.

(iii) The monitoring schedule.

(2) A response plan with expected water quality ranges and action levels.

(b) The public water system shall implement the nitrification control plan in accordance with accepted practices of the water supply industry.

(c) The public water system shall review and update the plan as necessary.

(d) The plan shall be retained onsite and shall be made available to the Department upon request.

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 (relating to State MCLs, MRDLs and treatment technique requirements; and unregulated contaminants). **Bottled water systems, vended water systems, retail water facilities and bulk water hauling systems using surface water or GUDI sources shall comply with the requirements in § 109.204 (relating to**

disinfection profiling and benchmarking). Bottled water systems, vended water systems, retail water facilities and bulk water hauling systems shall provide continuous disinfection for groundwater sources. Water for bottling labeled as mineral water[,] under § 109.1007 (relating to labeling requirements for bottled water systems, vended water systems and retail water facilities) shall comply with the MCLs except that mineral water may exceed the MCL for total dissolved solids.

* * * * *

(c) Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with the treatment technique requirements under Subchapter L [(relating to bin classification and treatment technique rule)] (relating to long-term 2 enhanced surface water treatment rule).

* * * * *

§ 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)]. **The monitoring requirements shall be applied], MRDLs and treatment techniques** 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] treatment is designed to remove:

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

* * * * *

(ix) *TTHM and HAA5 Stage 2 DBP Rule.* Beginning October 1, 2013, monitor annually for TTHM 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 **peak historical month [of warmest water temperature] EXCEPT THAT SYSTEMS MEETING THE CONDITIONS OF PARAGRAPH (D) OR (E) SHALL MONITOR IN ACCORDANCE WITH SECTION § 109.301(12)(ii).**

(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 (every 90 days) 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.

(C) COMPLIANCE DETERMINATIONS. COMPLIANCE WITH THE TTHM AND HAA5 MCLS IS BASED ON THE LRAA.

(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 FOUR 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 (B). 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 (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) AND AT THE END OF EACH SUBSEQUENT CALENDAR QUARTER. 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 AS SPECIFIED IN SUBCLAUSE (I), 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. IF A SYSTEM FAILS TO MONITOR, THE SYSTEM IS IN VIOLATION OF THE MONITORING REQUIREMENTS FOR EACH QUARTER THAT A MONITORING RESULT WOULD BE USED IN CALCULATING AN LRAA.

(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.

(xi) Beginning ____ (*Editor's Note: The blank refers to the effective date of adoption of this proposed FINAL-FORM rulemaking.*), a system using chlorine dioxide shall take one sample per day at each entry point. ~~If any daily sample exceeds the MRDL, the system shall collect chlorine dioxide check samples as follows:~~ **A VIOLATION OF THE CHLORINE DIOXIDE MRDL OCCURS WHEN ANY ENTRY POINT SAMPLE RESULT EXCEEDS THE CHLORINE DIOXIDE MRDL.**

~~—(A) A bottled water system shall take at least one sample from the same lot or batch and a bulk water hauler shall take at least one sample from the same tanker load.~~

~~—(B) A vended or retail water system shall take at least one sample as soon as possible but within 24 hours.~~

~~—(C) A violation of the chlorine dioxide MCL occurs when any check sample result exceeds the chlorine dioxide MCL following a routine sample result that exceeds the MCL.~~

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

(A) *Routine monitoring.* Systems shall take one sample per month for each entry point that uses ozone while the ozonation system is operating under normal conditions.

(B) *Reduced monitoring.*

(I) 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 **ANALYZED USING METHODS SPECIFIED IN 40 CFR 141.132(b)(3)(ii)(B)** 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 **ANALYZED USING METHODS SPECIFIED IN 40 CFR 141.132(b)(3)(ii)(B)** 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).

(xiii) Beginning ____ (Editor's Note: The blank refers to the effective date of adoption of this proposed rulemaking FINAL-FORM REGULATION.), a system that provides filtration of surface water or GUDI sources shall comply with the following:

(A) Maintain a residual at the entry point as specified in § 109.202(c)(1)(ii) (relating to State MCLs, MRDLs and treatment technique requirements).

(B) Monitor RESIDUAL disinfectant CONCENTRATION at the entry point in accordance with § 109.301(1)(i)(C).

(C) Report the results in accordance with § 109.701(a)(2) (relating to reporting and recordkeeping).

(xiv) Beginning ____ (Editor's Note: The blank refers to the effective date of adoption of this proposed rulemaking FINAL-FORM REGULATION.), a system that uses or obtains finished water from another permitted public water system using surface water or GUDI sources shall comply with the following requirements:

(A) As a minimum, a detectable residual disinfectant concentration of 0.20 mg/L measured as total chlorine, combined chlorine, chlorine dioxide or another level approved by the Department for systems using an alternate oxidizing disinfection treatment shall be maintained at the entry point as demonstrated by monitoring conducted under § 109.301(1) and (2) or (8)(v).

(B) Sampling points with nondetectable RESIDUAL disinfectant CONCENTRATIONS which have heterotrophic plate count measurements of less than 500/ml are deemed to be in compliance with clause (A).

(C) When the requirements of clause (A) or (B) cannot be achieved, the supplier shall initiate an investigation under the Department's direction to determine the cause, potential health risks and appropriate remedial measures.

(2) Vended water systems shall monitor in accordance with paragraph (1) except that vended water systems qualifying for permit by rule under § 109.1005(b), for each entry point shall:

(i) Monitor monthly for microbiological contaminants.

(ii) Monitor annually for total dissolved solids, lead and cadmium.

(iii) Conduct special monitoring as required by the Department.

(iv) Beginning ____ (Editor's Note: The blank refers to the effective date of adoption of this proposed rulemaking FINAL-FORM REGULATION.), a system that obtains finished water from another permitted public water system using surface water or GUDI sources shall also monitor in accordance with subparagraph (a)(1)(xiv).

(b) *Sampling requirements.*

* * * * *

(2) For the purpose of determining compliance with the monitoring and analytical requirements established under this subchapter, the Department will consider only those samples analyzed by a laboratory [certified] accredited by the Department, except that measurements of turbidity, fluoridation operation, residual disinfection concentration, **DAILY CHLORITE** temperature and pH may be performed by a person meeting the requirements of § 109.1008(c) (relating to system management responsibilities).

* * * * *

(5) Compliance monitoring samples required under subsection (a)(1)(iii) may be composited in accordance with 40 CFR 141.24(g)(7) (relating to organic chemicals [other than total trihalomethanes], sampling and analytical requirements) except:

* * * * *

(v) Samples obtained from an entry point which contains water treated by a community water supplier or nontransient noncommunity water supplier to specifically meet an MCL for a VOC listed under 40 CFR 141.61(a) may not be composited with other entry point samples.

(6) Sampling and analysis shall be performed in accordance with analytical techniques adopted by the EPA under the Federal act or methods approved by the Department.

(c) *Repeat monitoring for microbiological contaminants.*

(d) *A bulk water hauling system that serves at least 25 of the same persons year around. A bulk water hauling system that is determined by the Department to serve at least 25 of the same persons year round shall ALSO comply with the monitoring requirements for community water systems in accordance with § 109.301.*

(e) *A bulk water hauling [or] system, vended water system or retail water facility that serves at least 25 of the same persons over 6 months per year. A bulk water hauling [or] system, vended water system or retail water facility that is determined by the Department to serve at least 25 of the same persons over 6 months per year shall ALSO comply with the monitoring requirements for nontransient noncommunity water systems in accordance with § 109.301.*

(f) *Additional monitoring requirements for surface water and GUDI sources. Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with the monitoring requirements under Subchapter L (relating to long-term 2 enhanced surface water treatment rule).*

(g) *Additional monitoring requirements for groundwater sources. Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with the*

monitoring requirements under Subchapter M (relating to additional requirements for groundwater sources).

(h) Compliance determinations. Compliance with MCLs, MRDLs and treatment techniques shall be determined in accordance with §§ 109.202 and 109.301.

(i) Special monitoring requirements. Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with § 109.302 (relating to special monitoring requirements).

§ 109.1004. Public notification.

(a) General public notification requirements. A bottled water [or retail water] supplier shall give public notification in accordance with this section. A bulk water [or] hauler, vended water supplier or retail water supplier shall give public notification in accordance with Subchapter D (relating to public notification [requirements]). For the purpose of establishing a bulk [water or] hauling, vended or retail water supplier's responsibilities under Subchapter D, a bulk water supplier shall comply with the public notification requirements specified for a community water system and a vended or retail water supplier shall comply with the public notification requirements specified for a noncommunity water system.

(1) A bottled water [or retail water] supplier who knows that a primary MCL or an MRDL has been exceeded or treatment technique performance standard has been violated or has reason to believe that circumstances exist which may adversely affect the quality of drinking water, including, but not limited to, source contamination, spills, accidents, natural disasters or breakdowns in treatment, shall report the circumstances to the Department within 1 hour of discovery of the problem.

(2) If the Department determines, based upon information provided by the bottled water [or retail water] supplier or other information available to the Department, that the circumstances present an imminent hazard to the public health, the water supplier shall issue a water supply warning approved by the Department and, if applicable, initiate a program for product recall approved by the Department under this subsection. The water supplier shall be responsible for disseminating the notice in a manner designed to inform users who may be affected by the problem.

* * * * *

§ 109.1008. System management responsibilities.

* * * * *

(b) Operation and maintenance plan requirements. Bottled water, vended water, retail water and bulk water suppliers shall develop an operation and maintenance plan for each system. The operation and maintenance plan shall conform to the guidelines contained in Part III of the Department's *Public Water Supply Manual* which is available from the Bureau of [Water

Standards and Facility Regulation] Safe Drinking Water, Post Office Box 8467, Harrisburg, Pennsylvania 17105-8467. The water supplier shall implement the operation and maintenance plan in accordance with this chapter, and if appropriate in accordance with accepted practices of the bottled water, vended water, retail water facility or bulk water hauling industry. The plan shall be reviewed and updated as necessary to reflect changes in the operation or maintenance of the water system. The plan shall be bound and placed in locations which are readily accessible to the water system's personnel, and shall be presented upon request to the Department.

* * * * *

(f) *Cross-connection control program.* At the direction of the Department, the bottled water, vended water, retail water or bulk water supplier shall develop and implement a comprehensive control program for the elimination of existing cross-connections or the effective containment of sources of contamination, and prevention of future **[cross connections] cross-connections**. A description of the program, including the following information, shall be submitted to the Department for approval:

- (1) A description of the methods and procedures to be used.
- (2) An implementation schedule for the program.

(g) *Level 1 and Level 2 assessments.* Bottled water systems, vended water systems, retail water facilities and bulk water hauling systems shall comply with the requirements of § 109.705(b) (relating to system evaluations and assessments). Bottled water systems, vended water systems, retail water facilities and bulk water hauling systems may use a Nationally-recognized organization which inspects bottled water systems for compliance with 21 CFR Part 129, such as NSF, or another organization, state or country which utilizes an inspection protocol as stringent as NSF's protocols to conduct the Level 2 assessment.

(h) *Seasonal systems.* A bottled water system, vended water system, retail water facility or bulk water hauling system that operates as a seasonal system shall comply with the requirements of § 109.715 (relating to seasonal systems). (3) A description of the methods and devices which will be used to protect the water system.

(gi) *Significant deficiencies.* Bottled water and vended water systems, retail water facilities and bulk water hauling systems shall comply with § 109.705(d) and (e) (relating to sanitary surveys).

(hj) *Stage 2 Disinfectants/Disinfection Byproducts Rule monitoring plan and operational evaluation levels.* A bulk water hauling system, vended water system or retail water facility that is determined by the Department to meet the definition of a community or nontransient noncommunity public water system and that uses a chemical disinfectant or that obtains finished water from another public water system that uses a chemical disinfectant or oxidant shall comply with § 109.701(g)(2).

Subchapter K. LEAD AND COPPER

§ 109.1103. Monitoring requirements.

* * * * *

(c) *Follow-up monitoring after construction or modification of corrosion control treatment facilities.* A system which completes construction or modification of corrosion control treatment facilities in accordance with § 109.1102(b)(2) shall conduct the applicable monitoring specified in this subsection. A system which exceeds the lead action level after construction or modification of corrosion control treatment facilities shall begin lead service line replacement in accordance with § 109.1107(d) (relating to system management responsibilities).

(1) *Lead and copper tap monitoring.* A system shall monitor for lead and copper at the tap during each specified monitoring period at the number of sample sites specified in subsection (a)(1)(v).

* * * * *

(ii) A small or medium water system shall monitor during each of two consecutive 6-month monitoring periods beginning no later than 60 months from the **[date an action level was exceeded] end of the monitoring period in which the action level was exceeded.** The water supplier shall submit within 30 days of the end of the second monitoring period a request for the Department to designate optimal corrosion control treatment performance requirements for the system. Upon approval of the request, the Department will designate water quality parameter performance requirements in accordance with § 109.1102(b)(5) or source water treatment performance requirements in accordance with § 109.1102(b)(4). A small or medium water system that does not exceed the lead and copper action levels during each of two consecutive 6-month monitoring periods may reduce the number of sample sites and reduce the frequency of sampling to once per year in accordance with subsection (e)(1)(i). Systems not eligible for reduced monitoring under subsection (e)(1) shall monitor in accordance with subsection (d)(1).

* * * * *

(d) *Monitoring after performance requirements are established.* A system shall conduct the applicable monitoring under this subsection beginning no later than the next 6-month monitoring period that begins on January 1 or July 1 following the Department's designation of optimal corrosion control treatment water quality parameter performance requirements under § 109.1102(b)(5) or source water performance requirements under § 109.1102(b)(4). **A system which exceeds the lead action level after construction or modification of corrosion control treatment facilities shall begin lead service line replacement in accordance with § 109.1107(d).**

* * * * *

(e) *Reduced monitoring.*

* * * * *

(3) *Reduced monitoring revocation.*

(i) *Reduced monitoring revocation for large water systems.* A large water system authorized to conduct reduced monitoring under this subsection that fails to meet the lead or copper action level during any 4-month monitoring period or that fails to operate within the range of performance requirements for the water quality parameters specified by the Department under § 109.1102(b)(5) on more than any 9 days in a 6-month period shall comply with the following:

* * * * *

(D) [The] If either the lead or copper action level is exceeded, the water supplier shall conduct source water monitoring in accordance with subsection (d)(3). Monitoring is required only for the parameter for which the action level was exceeded. For systems on annual or less frequent monitoring, the end of the monitoring period is September 30 of the calendar year in which sampling occurs, or, if the Department has designated an alternate monitoring period, the end of the monitoring period is the last day of the 4-month period in which sampling occurs.

* * * * *

(g) *Sample site location plan.* The water supplier shall complete a sample site location plan which includes a materials evaluation of the distribution system, lead and copper tap sample site locations, water quality parameter sample site locations[,] and certification that proper sampling procedures are used. The water supplier shall complete the steps in paragraphs (1)—(3) by the applicable date for commencement of lead and copper tap monitoring under subsection (a)(1) and the step in paragraph (4) following completion of the monitoring. The water supplier shall keep the sample site location plan on record and submit the plan to the Department in accordance with § 109.1107(a)(1).

* * * * *

(2) *Lead and copper tap sample site selection.* Lead and copper tap sampling sites are classified as tier 1, tier 2 or tier 3. Tier 1 sites are the highest priority sample sites.

* * * * *

(v) *Sample sites with lead service lines.* A system that has a distribution system containing lead service lines shall draw 50% of the samples it collects during each monitoring period from sites that contain lead pipes or copper pipes with lead solder, and 50% of **[those samples] the samples it collects during each monitoring period** from sites served by a lead service line. If a water system cannot identify a sufficient number of sampling sites served by a lead service line, the system shall collect first draw samples from each site identified as being served by a lead service line.

* * * * *

(k) *Monitoring waivers for small systems.* A small system that meets the criteria of this subsection may apply to the Department to reduce the frequency of monitoring for lead and copper under this section to once every 9 years if it meets all of the materials criteria specified in paragraph (1) and all of the monitoring criteria specified in paragraph (2). A system that meets the criteria in paragraphs (1) and (2) only for lead, or only for copper, may apply to the Department for a waiver to reduce the frequency of tap water monitoring to once every 9 years for that contaminant only.

* * * * *

(6) *Requirements following waiver revocation.* A water system whose waiver has been revoked is subject to the corrosion control treatment, and lead and copper tap water monitoring requirements as follows:

* * * * *

(ii) If the system meets both the lead and copper action levels, the system shall monitor for lead and copper at the tap no less frequently than once every 3 years **[using] in accordance with the frequency, timing and the reduced number of sample sites specified in subsection (e).**

§ 109.1107. System management responsibilities.

* * * * *

(d) *Lead service line replacement.*

* * * * *

(4) *Conditions of replacement.* The water supplier shall replace the portion of the lead service line that it owns. In cases where the system does not own the entire lead service line, the system shall notify the owner of the line, or the owner's authorized agent, that the system will replace the portion of the service line that the system owns and shall offer to replace the owner's portion of the line. A system is not required to **bear the cost of replacing the privately-owned portion of the line or to replace the privately-owned portion of the line** if the owner refuses to pay for the cost of replacement of the privately owned portion of the line, or if any laws prohibit this replacement. A system that does not replace the entire length of service line shall complete the following tasks:

* * * * *

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

§ 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):

* * * * *

(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] 100 *E. coli*/100 mL.

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

* * * * *

(i) *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 [subsection (b)(1) or (2)] paragraph (1) or (2) applies.

* * * * *

Subchapter M. ADDITIONAL REQUIREMENTS FOR GROUNDWATER SOURCES

§ 109.1302. Treatment technique requirements.

(a) *Community groundwater systems.* Community groundwater systems are required to provide continuous disinfection under [§ 109.202(c)(2)] § 109.202(c)(3) (relating to [state] State MCLs, MRDLs and treatment technique requirements) and in addition shall:

* * * * *



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Safe Drinking Water Disinfection Requirements Rule

25 Pa. Code Chapter 109
46 Pa.B. 857 (February 20, 2016)
Environmental Quality Board Regulation #7-520
(Independent Regulatory Review Commission #3136)

Comment and Response Document

List of Commentators

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<p>2. Doug Crawshaw The York Water Company 130 E. Market Street York, PA 17401 dougc@yorkwater.com <i>comments and testimony</i></p>	<p>9. Jeanne VanBriesen 12 Holland Road Pittsburgh, PA 15235 jeanne@cmu.edu</p>
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Introduction

The Environmental Quality Board (Board) adopted the proposed disinfection requirements rule at its November 17, 2015 meeting. On February 11, 2016, the Department of Environmental Protection (DEP) submitted a copy of the proposed rulemaking to the Independent Regulatory Review Commission (IRRC) and to the Chairpersons of the Senate and House Environmental Resources and Energy Committees for review and comment in accordance with Section 5(a) of the Regulatory Review Act (71 P.S. § 745.5(a)). The proposed rulemaking was published in the *Pennsylvania Bulletin* on February 20, 2016 (46 Pa.B. 857) with provision for a 60-day public comment period that closed on April 19, 2016. Three public hearings were held during the public comment period to accept verbal comments on the proposed regulation. Comments were received from 21 commentators including IRRC. All comments can be viewed in their entirety on the Department of Environmental Protection's (Department) eComment page for this rulemaking:

<http://www.ahs.dep.pa.gov/eComment/ViewComments.aspx?enc=8YWleHIdijzUAfiG53EkjT71%2fkEF%2ftLO%2fP436oCNhfE%3d>

Comments and Responses

- 1. Comment:** We have determined that [the proposed regulation #7-520] will have minimal effect on our membership since very few municipal systems are not already in compliance. The regulations are to strengthen public water systems requirements for microbial protection and disinfection prerequisites in those systems that do not have the necessary equipment to meet the established federal and state standards. Since it is a health issue it is hard to argue that the changes are not necessary. The only concern is the potential cost to those potential municipal or municipal authority systems that need to not only upgrade their monitoring equipment which should be at a minimal cost, but also need to install booster chlorination stations at a substantial cost. (1)

Response: The Department appreciates the commentators' support of this rulemaking and acknowledges the concern. Please see the response to comment # 5 regarding cost estimates.

- 2. Comment:** There is no clear or present public health threat being addressed by the proposed rule. Pennsylvania does not have a problem with *E. coli* outbreaks that can be attributed to water systems. (2, 3, 4, 5, 7, 10, 11, 12, 13, 15, 19)

Response: Drinking water in the distribution system is not sterile, regardless of the degree to which the water is treated. The water contains microbes that survive the treatment process or enter the distribution system through the pipe network. Many of these microbes can attach to the pipe wall and become part of a biofilm. Biofilms likely exist in all distribution systems, and are recognized as a normal part of the distribution system. Contamination and material in the biofilm may subsequently be released into the flowing water under various circumstances. As a result, biofilms can act as a slow-release mechanism for persistent contamination of the water. The organisms and their products may decrease disinfectant levels (by increasing disinfectant demand), pose a direct public health risk, or create taste and odor problems (EPA, 2002).

The amendments included in this rulemaking are intended to strengthen the distribution system disinfectant residual requirements by increasing the minimum residual in the distribution system to 0.2 mg/L free or total chlorine. The Department's previous disinfectant residual requirements for distribution systems had not been substantially updated since 1992 and required the maintenance of a

detectable residual that was defined as 0.02 mg/L. The Department's previous treatment technique was not protective of public health because a residual of 0.02 mg/L is below the minimum reporting level of 0.1 mg/L and represents a false positive reading.

Maintenance of a disinfectant residual in the distribution system is:

- Required under the Federal Surface Water Treatment Rule for all systems using surface water and groundwater under the direct influence of surface water (GUDI) sources, and under Chapter 109 for all community water systems and those noncommunity water systems that have installed disinfection.
- Designated by the U.S. Environmental Protection Agency (EPA) as the best available technology for compliance with both the Total Coliform Rule (TCR) and the Revised TCR.
- Considered an important element in a multiple barrier strategy aimed at maintaining the integrity of the distribution system and protecting public health.
- Intended to maintain the integrity of the distribution system by: inactivating microorganisms in the distribution system, indicating distribution system upset and controlling biofilm growth.

The preamble to the proposed rule included numerous studies, reports and data which provide the scientific and technical basis for a minimum disinfectant residual of 0.2 mg/L in the distribution system. Additional studies, reports and data were reviewed for this final-form rulemaking.

EPA published a Six-Year Review 3 (SYR 3) Technical Support Document for Microbial Contaminant Regulations in December 2016 (EPA, 2016). The 1996 Safe Drinking Water Act amendments require EPA to periodically review existing national primary drinking water regulations and determine which, if any, need to be revised. The purpose of the review, called the SYR, is to identify those regulations for which current health effects assessments, changes in technology, analytical methods, occurrence and exposure, implementation or other factors will improve or strengthen public health protection.

As part of the SYR 3, EPA requested compliance monitoring data from states/tribes from 2006 through 2011 regarding the presence/absence of total coliforms, *E. coli* and fecal coliforms; and data for disinfectant residual levels in the distribution system. Microbial contaminant data from 34 states/tribes met the quality assurance/quality control criteria and are included in the SYR 3 microbial dataset.

Using the SYR 3 data, EPA conducted an occurrence analysis of microbial indicators paired with disinfectant residual data that are measured at the same time and location. The five bins of free and total chlorine residual concentrations are:

- Bin 1: Concentrations equal to 0 (“not detected or below detection limit”)
- Bin 2: Concentrations >0 and ≤ 0.2 mg/L
- Bin 3: Concentrations >0.2 mg/L and ≤ 0.5 mg/L
- Bin 4: Concentrations >0.5 mg/L and ≤ 1.0 mg/L
- Bin 5: Concentrations >1.0 mg/L

This represents the first national dataset available to evaluate microbial data as a function of disinfectant residual. In summary, based on an assessment of 5.434 million samples, EPA determined:

- There was a lower rate of occurrence of both total coliform and fecal coliform/*E. coli* positives as the free or total chlorine residual increased to higher levels.
- This relationship between chlorine residuals and occurrence of total coliform and fecal coliform/*E. coli* positives was similar to results reported by the Colorado Department of Public Health and Environment (Ingels, 2015). In addition, this relationship is consistent with the findings of LeChevallier et al. (1996) which stated that disinfectant residuals of 0.2 mg/L or more of free chlorine, or 0.5 mg/L or more of total chlorine, are associated with reduced levels of coliform bacteria. Both studies were discussed in the preamble to the proposed rule.
- A detectable concentration of disinfectant residual in the distribution system may not be adequately protective of public health due to microbial pathogens. This is based on concerns about analytical methods and the potential for false positives (Wahman and Pressman, 2015). According to EPA, maintaining a disinfectant residual above a set numerical value in the distribution system may improve public health protection from a variety of pathogens.

EPA's concerns about the analytical methods and the potential for false positives is consistent with information provided by HACH®, the leading manufacturer of field test equipment. HACH® provided information to the Small Water Systems Technical Assistance Center Advisory Board (TAC) during development of the proposed rulemaking that supported a minimum reporting level for disinfectant residual of 0.1 mg/L. Details related to this data were included in the preamble to the proposed rule.

In order to ensure that the Department's disinfectant residual requirements are adequately protective of public health and are achievable using currently available analytical methods, the Department has retained the level of 0.2 mg/L as a numeric standard. This level represents a standard that is above the minimum reporting level of 0.1 mg/L. Due to EPA's rules of rounding for compliance determinations, disinfectant residual levels ≥ 0.15 mg/L will round up to 0.2 mg/L and will be in compliance with the numeric standard.

3. **Comment:** DEP's existing minimum disinfection residual requirement for distribution systems defined as 0.02 mg/L does not represent a true detectable residual. Scientific studies presented during the stakeholder process have demonstrated that 0.1 mg/L chlorine residual does in fact represent a true detectable residual. The minimum residual should be set at 0.1 mg/L. A minimum value of 0.1 mg/L is a responsible level given the Department's concerns regarding a detectable level. The proposed 0.2 mg/L does not provide any additional health benefits. (2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 19)

Response: Although many commentators recommend setting the disinfectant residual level at 0.1 mg/L, no scientific studies or reports were provided that indicate this level of disinfectant residual is protective of public health. As per the response to comment #2, studies and data in support of a level of 0.2 mg/L are well-established.

It has been shown that the level of 0.1 mg/L represents the minimum reporting level based on currently available N, N-diethyl-p-phenylenediamine (DPD) analytical methods. Any drinking water standard for disinfectant residuals would need to be set above the minimum reporting level so that compliance with the standard can be measured and achieved.

In addition, a standard of 0.1 mg/L may not adequately address potential interferences from organic chloramines and manganese that could mask the actual level of disinfectant residual in the distribution system and produce a false positive reading. Although routine monitoring for

manganese is not required, water suppliers have submitted nearly 3,100 results from all over the state with detections for manganese.

Therefore, the regulations set a minimum disinfectant residual level of 0.2 mg/L in the distribution system to account for the minimum reporting level of 0.1 mg/L, to compensate for known interferences in the DPD analytical method, and increase protection of public.

4. **Comment:** The compliance calculation for systems serving greater than 33,000 people should be 95% in two consecutive months and the compliance calculation for systems serving 33,000 or fewer people should be 75% in two consecutive months. However, we are concerned that the increased residual monitoring (from once/month to once/week) will increase small system operating costs. (2, 4, 10, 12, 13, 15, 19)

The compliance calculation for systems serving greater than 33,000 people should be 95% in two consecutive months. However, small systems should be given an option to select compliance monitoring based on a 75th percentile (weekly monitoring) or by choosing compliance based on a single monthly sample result. The cost for small systems such as those that utilize circuit riders or commercial environmental accredited laboratories to perform such weekly monitoring should be considered. (3)

Response: Pennsylvania ranks third in the nation for the number of regulated public water systems (nearly 9,000) and has automated compliance determinations for over 90% of the monitoring/reporting and health-based violations that are reported to EPA to maximize use of staff resources. For consistency, one method of determining compliance must be selected. Additionally, any system using surface water (SW) or GUDI sources must comply with the 95% compliance determination specified in the federal regulations. Therefore, the Department requested that TAC recommend which option should apply to small groundwater systems. TAC recommended that the compliance calculation in the proposed rulemaking should be retained (that no more than one sample is below the minimum disinfectant residual level in two consecutive months).

With regard to operating costs, it is unlikely costs to small systems would increase because Section 109.304 specifies that certain parameters (including turbidity and disinfectant residuals) may be analyzed by an appropriately certified operator or a person using a standard operator procedure as specified in the Water and Wastewater Systems' Operator Certification Act. Small water systems that are required to install and maintain disinfection (under either the Surface Water Treatment Rule (SWTR) or the Groundwater Rule (GWR)) are currently required to measure the disinfectant residual at the entry point at least once per day, so a procedure is in place for conducting daily disinfectant residual measurements. The weekly distribution system measurements may be conducted by the same person.

5. **Comment:** The stated compliance benefits in the proposed rule are unfounded and the associated compliance costs are dramatically underestimated. Actual costs to achieve compliance are much higher than the Department's predictions. Recurring annual operating costs were not accounted for in the Department's projections. (2, 3, 4, 5, 7, 10, 11, 12, 13, 15, 16, 17, 19)

Response: Please see the response provided to Comment #2. Public health protection is achieved through a multi-barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and the integrity of drinking water distribution systems.

Systems may need to increase the frequency of or improve the effectiveness of existing operation and maintenance best management practices (BMPs), such as flushing, storage tank maintenance, cross connection control, leak detection, and effective pipe replacement and repair practices, in order to lower chlorine demand and meet disinfectant residual requirements at all points in the distribution system. These BMPs will also reduce water age and likely lower disinfection byproduct levels in the distribution system.

The Board requested comment on the costs to achieve compliance with the new provisions and the Department's cost estimates were updated in the final-form rulemaking in response to public comments.

Some systems with very large and extensive distribution systems may need to install automatic flushing devices, tank mixers or booster chlorination stations to achieve a 0.2 mg/L at all points in the distribution system. The Department's revised capital expense estimates and annual operational expenses are as follows:

Type of Facility	Capital Expenses	Annual Expenses
Automatic flushing device	\$2,500	\$750
Tank mixer	\$75,000	\$0
Booster chlorination station	\$250,000	\$10,000

It is estimated that 25% of community water systems serving over 25,000 people, or ~20 systems, may need to install automatic flushing devices, tank mixers or booster chlorination stations. Of these 20 systems:

- 12 water systems may need to install up to ten automatic flushing devices for capital costs of up to \$25,000 and annual expenses of up to \$7,500 per system. The total cost for 12 systems is estimated to be up to \$300,000 in capital costs and up to \$90,000 in annual expenses.
- Four water systems may need to install up to two tank mixers for capital costs of up to \$150,000 per system. The total cost for four systems is estimated to be up to \$600,000 in capital costs.
- Four systems may need to install up to four booster chlorination stations for capital costs of up to \$1,000,000 and annual expenses of up to \$40,000 per system. The total cost for four systems is estimated to be up to \$4,000,000 in capital costs and up to \$160,000 in annual expenses.

Costs for small systems are not expected to increase because most small systems are already maintaining adequate disinfectant residuals (0.40 mg/L) as required by the GWR.

Total estimated costs to the regulated community are as much as \$4,900,000 in capital costs and up to \$250,000 in annual operational expenses. Capital costs are one-time costs expected to be split over the first three years. Annual operational expenses are not expected to begin until year two.

Estimate of Fiscal Savings and Costs						
	Current FY	FY +1	FY +2	FY +3	FY +4	FY +5
Savings:	\$	\$	\$	\$	\$	\$
Regulated community	0	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Local & state costs	0	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Total savings	0	2,600,000	2,600,000	2,600,000	2,600,000	2,600,000
Costs:		\$	\$	\$	\$	\$
Regulated community	0	1,630,000	1,880,000	1,880,000	250,000	250,000
Local & state costs	0	0	0	0	0	0
Total costs	0	1,630,000	1,880,000	1,880,000	250,000	250,000

However, these costs are offset by the avoidance of waterborne disease outbreaks. If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools.

6. **Comment:** Disinfection byproducts (DBPs) are likely to increase at some utilities as a result of increasing the distribution disinfection residual to 0.2 mg/L. Additionally, compliance with the Lead and Copper Rule will likely be negatively impacted. (2, 3, 5, 7, 8, 10, 11, 12, 13, 14, 15, 19)

Response: Based on currently available data, many water systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. There are 1,949 community water systems (CWSs) that are required to provide and maintain disinfection treatment. Of these systems, 1,298 (67%) are required to conduct only one measurement each month. An additional 232 systems are required to collect only two measurements each month. In total, 1,530 systems (79%) are only required to collect one or two disinfectant residual measurements each month, which means the average result reported each month for the large majority of systems is essentially the same as the actual sample results.

The Department reviewed the summary data (distribution system disinfectant residual average result values) from Jan 2012-May 2017 for the 1,949 CWSs.

- During this period, 165,328 average result values were reported; of these records, 154,623 average result values (93.5%) were at or above 0.15 mg/L.
- For the systems that are required to conduct only one or two measurements each month, 136,743 average result values were reported; of these records, 126,406 average result values (92.4%) were at or above 0.15 mg/L.
- For the systems that only conduct one measurement each month, 116,900 average result values were reported; of these records, 107,366 (91.8%) were at or above 0.15 mg/L.

The below table shows the number of CWSs and the number of average result summary records submitted for each population group.

CWS Disinfectant Average Result by Population Category

Population Group	No. Samples Required	No. PWSs	Total POPL ¹	Total No. Records	No. Results < 0.15	No. Results ≥ 0.15
< 25 ²	1	9	172	300	14	286
25-1,000	1	1290	311,515	116,600	9,520	107,080
1,001-2,500	2	231	381,322	19,843	803	19,040
2,501-3,300	3	86	255,069	6,292	168	6,124
3,301-4,100	4	28	103,784	2,534	65	2,469
4,101-4,900	5	37	164,629	2,518	11	2,507
4,901-5,800	10	27	145,425	1,752	0	1,752
5,801-6,700	15	22	137,596	1,672	1	1,671
6,701-7,600	20	22	156,720	1,246	0	1,246
7,601-8,500	25	22	178,117	1,194	22	1,172
8,501-12,900	30	46	469,925	3,311	34	3,277
12,901-33,000	35	69	1,436,581	4,333	66	4,267
> 33,000	≥ 40	60	7,628,402	3,733	1	3,732
Total	---	1,949	11,369,257	165,328	10,705	154,623

¹Total POPL is the total population served for the population category, based on the CWS population in PADWIS. The Revised Total Coliform Rule required water systems to submit a revised sampling plan which included updated population numbers in accordance with existing EPA guidance. The CWS population served includes nontransient and transient consumers.

²These CWSs triggered applicability under the SDWA because each system provides water to 15 or more service connections.

There are an additional 621 noncommunity water systems with disinfection treatment that are currently required to maintain a disinfectant residual in the distribution system. Of these 621 water systems, 598 (96%) are only required to collect one or two residual measurements each month; 554 (89%) are only required to conduct one measurement each month.

Therefore, it is appropriate to use the average result data, and the data indicate that most water systems are already in compliance with these minimum disinfection residual requirements. Since the majority of systems are already meeting these minimum requirements, the Department would not expect a large increase in DBP non-compliance rates

7. **Comment:** Taste and odor complaints will likely increase if the minimum distribution disinfection residual is set at 0.2 mg/L. (2, 8, 10, 11, 12, 13, 19)

Response: The majority of water systems are already maintaining a 0.2 mg/L disinfectant residual level without taste and odor complaints based on the disinfectant residual values reported to the Department since 2012 (noted in the response to comment #6).

8. **Comment:** The option for Heterotrophic Plate Count (HPC) should be retained as an alternative compliance criteria for surface water systems when the distribution disinfectant residual is below the minimum required level. Removing the use of HPC as an indicator of distribution health is effectively removing a tool from the operator's tool box. (2, 3, 5, 6, 7, 8, 12, 13, 15, 19)

Response: The alternative compliance option for HPC allowed under the federal regulation applies only to systems using surface water sources (including purchased water) and is allowed instead of maintaining a “detectable” disinfectant residual. This regulation is setting a minimum disinfectant residual level of 0.2 mg/L for all water systems that are required to install disinfection to ensure public health protection regardless of the source of water. The Board requested comment on any references or studies that support the use of HPC as an alternative compliance criteria for a level of 0.2 mg/L. One reference was provided, but it was for a draft unpublished document. The Department could find no published studies or reports that support its use in lieu of a numeric standard of 0.2 mg/L.

Bottled Water, and Vended Water Systems, Retail Water Facilities and Bulk Water Hauling (BVRB) systems that use surface water or GUDI sources or that purchase water from a system that uses surface water or GUDI sources must meet the federal distribution system disinfection residual requirements. The HPC alternative compliance option is being retained for BVRB systems because these systems are purchasing finished water that has already been treated with an appropriate level of disinfection. These systems often remove chlorine from the water to improve taste, and then re-treat the water with an alternative secondary disinfectant such as ultraviolet light that does not provide a detectable residual.

Water systems may still choose to monitor for HPC as part of their overall operation and maintenance practices.

9. **Comment:** Requiring water utilities to issue Tier 2 public notification (PN) for failing to meet 0.2 mg/L will unnecessarily erode public confidence in water quality. (2, 4, 8, 10, 12, 13, 15, 19)

Response: There is a risk to public health if adequate disinfection is not maintained. Please see the response provided to comments # 2 and 15.

The federal rule requires Tier 2 PN for failure to meet the disinfectant residual treatment technique in the distribution system. Pennsylvania must be at least as stringent as the federal rule, 40 CFR 141.203(a). Further, these regulatory amendments will not substantially increase the number of Tier 2 PNs. As per the response to comment #6, the majority of systems are already meeting a disinfectant residual of ≥ 0.15 mg/L. In addition, a violation does not occur unless the water system fails to meet the minimum level in more than five percent of samples for two consecutive months. The Department anticipates that most water systems will be able to make operational changes (i.e., increase flushing, etc.) after the first monthly failure and improve water quality ahead of the next monthly monitoring period. It should be the exception, not the norm, that water systems fail to meet the minimum level for two consecutive months.

10. **Comment:** The minimum entry point residual should remain at 0.2 mg/L instead of changing it to 0.20 mg/L. DEP’s statement that “strip chart recorders can record to two decimal places” is inaccurate. While [adding a second digit] was done with the groundwater rule requirement (minimum 0.40), the second digit is still uncertain given the current field testing kits. The field testing kits are used to calibrate on-line instrumentation. Scientific study and analysis in a scientific manner should be done to address the ability to regulate to the most significant figure. (3, 15)

Response: Continuous entry point disinfectant residual monitoring and recording is required by existing Federal requirements in 40 CFR 141.74(c)(2) and is necessary to protect consumers against waterborne pathogens such as bacteria, protozoans, and viruses. Strip chart and circle chart

recorders can record measurements to two decimal places depending on the resolution that is used. In cases when the requisite scale and resolution is not possible, an upgrade to electronic recording devices would cost approximately \$1,560 (based on 6/16/2017 prices). This cost estimate includes the cost of purchasing a HACH© SC200 Universal Controller (\$1360) which is capable of continuously recording and storing electronic disinfection data on an SD card. Installation can be accomplished using existing in-house water system maintenance or operations staff at an estimated cost of \$200. The Department's cost estimate does not include the cost to connect the instrumentation to a supervisory control and data acquisition (SCADA) system as SCADA systems are not required for compliance with this regulation.

It is important to note that a general reference to "strip charts" is not equal to circle charts. Strip charts are a very different type of recording device than circle charts even though they both use paper. Strip charts are used much less frequently than circle charts in Pennsylvania filter plants for compliance monitoring. There are less than 11 filter plants in Pennsylvania (out of 353 filter plants) that are using a strip chart technology that cannot be adjusted to read to two decimal places. At least two of these plants are currently in the process of replacing/upgrading their recording equipment.

The remaining systems using paper recording devices that are not currently recording to two decimal places would simply need to switch the paper chart used (i.e. from a 7-day chart to a 24-hour chart) and adjust the recording device to new resolution. Although some plants are not staffed continuously, there should not be additional operational costs to replace the paper charts daily, because daily on-site visits to verify filter plant performance should be part of a water system's routine operation & maintenance.

Additionally, the current field test instruments (e.g. colorimeters) are calibrated by the manufacturer and provide the residual measurement reading to two decimal places. This data is what water systems are using for compliance determinations and to calibrate their on-line instruments.

- 11. Comment:** The use of the average data to draw the conclusion that the majority of public water systems already meet the proposed 0.2 mg/L is inappropriate. One cannot utilize monthly average chlorine residuals from a water system to project 'ease of compliance' nor accurately project expenditures. A reliance on average monthly chlorine residual results fails to recognize the wide variation that is possible, especially in medium to large distribution systems. By using the monthly average distribution system disinfectant residual data, DEP has dramatically overestimated the potential for utilities to comply with the proposed required minimum distribution system disinfectant residual. (2, 3, 4, 5)

Response: Please see the response provided to comment #6.

- 12. Comment:** The provisions of the proposed rulemaking should be deferred (for 24-36 months). The regulation should be revised to allow water systems the ability to submit an implementation plan giving systems adequate time to make necessary operational changes. (3, 4, 5, 8, 14, 17)

Response: In response to public comments, the implementation dates have been revised. The current regulatory requirements will remain in effect for 12 months after the final regulation is published in the *Pennsylvania Bulletin*. Water systems will have six months after the final regulation is published to develop and submit a monitoring plan, and water systems using chloramines will have one year to develop a nitrification control plan. Compliance monitoring under the proposed regulation has been deferred for one year after the final regulation is published in the

Pennsylvania Bulletin for water systems to adjust operational practices as needed. Systems that need capital improvements or need to complete more complex operational changes can request a system-specific compliance schedule.

- 13. Comment:** Disinfection residuals taken in response to customer complaints or water main breaks and repairs should not be used in determining compliance. (8)

Response: These measurements will not be used for compliance determinations. Distribution disinfectant residual compliance monitoring locations will be specified in a monitoring plan.

- 14. Comment:** The regulation should allow flexibility in system-specific nitrification control plans, including the parameters to be monitored. (3)

Nitrification is not an immediate public health issue. The regulation should not require a nitrification control plan. (5)

Response: Nitrification occurs when ammonium is converted to nitrate, which then may be further converted to nitrite. Nitrate and nitrite are acute contaminants for which EPA has set maximum contaminant levels (MCLs). Therefore, nitrification is a public health issue. Systems that chloramine have the potential for elevated nitrate and nitrite levels to occur within the distribution system. This regulation allows flexibility for systems to develop a nitrification control plan based on their needs. The regulation specifies the minimum elements of the plan and allows each water system to identify the parameters that will be monitored.

- 15. Comment:** Increasing the required minimum distribution system disinfectant residual will not reduce the likelihood of *E. coli* and *Legionella*. (5,7)

Response: Please see the response provided to comment #2.

- 16. Comment:** *Legionella* is not an issue that public water suppliers can control since it is a premise plumbing issue. The U.S. Center for Disease Control defines premise plumbing as “the drinking water system that is inside housing, schools, and other buildings.” Water utilities are not responsible for premise plumbing problems in homes, businesses, schools, hospitals, hotels, and all other commercial and industrial facilities. Further regulations on increasing chlorine levels in the distribution system will not fix the known problems within the building footprint of these customers. (2, 3, 5, 10)

Response: Water distribution systems consist of an interconnected series of pipes, storage facilities, and components that convey drinking water and are also designed to meet fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities. Public water systems depend on distribution systems to provide an uninterrupted supply of pressurized safe drinking water to all consumers. Distribution systems convey water from treatment facilities (or from the source in the absence of treatment) to the consumer.

As noted in the response to comment #2, drinking water in the distribution system is not sterile, regardless of the degree to which the water is treated. The water contains microbes that survive the treatment process or enter the distribution system through the pipe network and become part of a biofilm. Biofilms can act as a slow-release mechanism for persistent contamination of the water. It

is likely that drinking water is an important, if not the primary, source of Legionella that seed hot water plumbing systems and cause outbreaks (EPA, 2002).

Premise plumbing is connected to the public drinking water distribution system via the service line. Virtually every change in water quality associated with the public water system can also occur in premise plumbing, although there are additional concerns such as those related to water temperature and stagnation that can be exacerbated in premise plumbing. The characteristics of the water provided from the treatment plant, and its interactions within the distribution system, and the unique characteristics of premise plumbing all affect the public health risk of the drinking water at the tap and complicate the formulation of coherent strategies to minimize risk. (EPA, 2010)

Maintaining a disinfection residual throughout the distribution system is a key element for controlling pathogen re-growth in both the distribution system and premise plumbing.

- 17. Comment:** Monitoring & reporting for CTs should be deferred or eliminated. Many small systems do not have online instrumentation to monitor flow, pH, temperature or other pertinent parameters. (3, 15)

Response: Existing state and federal regulations mandate CT/log inactivation requirements (CT is the product of residual disinfectant concentration (C) and disinfectant contact time (T)). Filter plants are required to maintain 90% (1-log) inactivation of Giardia cysts and 99.9% (3-log) inactivation of viruses by way of disinfection. When these levels are not achieved, customers may be exposed to pathogenic Giardia cysts and viruses. The CT value reported to the Department is a calculated value using existing data to demonstrate that the water system is maintaining the level of pathogen inactivation required under the existing regulation.

It is not necessary to install on-line instruments to monitor the elements needed to calculate CT values. Water systems that currently use hand-held or bench top instruments to measure pH, temperature, and disinfectant residuals as well as existing flow meters and clearwell levels will continue to use these instruments to obtain the information necessary to calculate a daily CT value. The parameters needed to calculate a CT value are all process control parameters that filter plant operators currently measure and use to provide and maintain an adequate level of treatment. The CT value reported to the Department is a calculated value using existing data to demonstrate that the water system is maintaining the level of pathogen inactivation required under the existing regulation.

- 18. Comment:** The proposed language in the preamble and Annex A should be revised to clarify requirements for Tier 1 Public Notice for Minimum Entry Point Disinfectant Residuals and Treatment Technique Requirements for pathogenic bacteria, viruses and protozoan cysts. (5)

Response: The language has been edited to clarify that a Tier 1 PN is required if the entry point residual is below the minimum value for more than four hours and the water system has either not met the required log inactivation value or the log inactivation value has not been calculated during that period.

- 19. Comment:** The proposed language in Annex A should be revised to accurately reflect how water systems determine peak hourly flow to ensure compliance with treatment technique requirements. (5)

Response: The language has been edited to clarify that the log inactivation (CT) value is calculated during the time of expected peak hourly flow. CT values should be calculated in real-time under several worst-case conditions (highest flow, coldest temperature, highest pH level, lowest disinfectant residual level), to ensure adequate disinfection is maintained. Because the CT calculation involves several parameters that fluctuate based on changing raw water chemistry, it is not practical to define what constitutes worst-case conditions for all water systems. To ensure consistency in implementation, the regulation requires, at minimum, a daily calculation during the hour of expected highest flow.

20. **Comment:** The Preamble presents the benefits of the proposed regulation as avoidance of the costs associated with avoiding waterborne disease outbreaks, like the cryptosporidiosis outbreak in Milwaukee, Wisconsin in 1993 and the salmonellosis outbreak in Alamosa, Colorado in 2008. The events (and their associated costs) like the *Cryptosporidiosis* outbreak in Milwaukee, Wisconsin in 1993 and the *Salmonellosis* outbreak in Alamosa, Colorado in 2008 cannot be avoided by simply raising the required minimum distribution system disinfectant residual. The avoidance of event and costs associated with these outbreaks should be removed from the Preamble entirely. (5)

Response: This language was included in the original Preamble as presented to the EQB on April 21, 2015. After the EQB separated that proposed rulemaking, the various documents needed to be subsequently revised. This language was supporting information for provisions that were included in the General Update proposed regulation (presented to the EQB on May 17, 2017). The inclusion of this information in the Disinfection Requirements proposed rulemaking was an error and is not included in the Order of the final-form rulemaking.

21. **Comment:** The proposed Disinfection Requirements Rule regulation package submitted to the Independent Regulatory Review Commission (IRRC) states that Pennsylvania is at a competitive disadvantage compared to other states with more stringent disinfection residual requirements. DEP's statement to IRRC is incorrect because most states do not define detectable or have numeric residual requirements. Although other states may have more stringent required minimum distribution system disinfectant residual requirements, the majority of states do not define detectable (40 states) or have numeric residual requirements (26 states). There are 19 states that regulate distribution system disinfectant residual at or above 0.2 mg/L; however, 31 states regulate distribution system disinfectant residual below 0.2 mg/L or require a "detectable" disinfectant residual and detectable might not be defined. Therefore, Pennsylvania is not an outlier, in the minority, or at a competitive disadvantage compared to other states. (5)

Response: The information submitted to IRRC does not state that Pennsylvania is at a competitive disadvantage. It states that Pennsylvania will not be at a competitive disadvantage when these provisions are implemented because at least 23 other states have requirements more stringent than Pennsylvania's current standard of 0.02 mg/L and at least 19 of these states have promulgated a disinfectant residual at least as stringent as the proposed level of 0.2 mg/L. Safe drinking water is vital to maintaining healthy and sustainable communities. Proactively avoiding incidents such as waterborne disease outbreaks can prevent loss of life, reduce the incidence of illness, and reduce health care costs. As noted in the response to comment #3, this regulation does not specify a method detection limit or minimum reporting limit. Instead, the regulation sets a minimum disinfectant residual level of 0.2 mg/L in the distribution system.

22. **Comment:** DEP's intentions to regulate standards for water systems utilizing free chlorination and not for systems utilizing chloramines gives the appearance of being biased. (16)

Response: The minimum disinfectant residual requirement of 0.2 mg/L applies to water systems using free chlorine and chloramines. The residual measurement (free vs. total chlorine) would depend on which type of disinfectant was used to maintain disinfection within the distribution system.

23. **Comment:** The current regulatory requirements for vended water systems (i.e. water dispensing units (WDUs)) are sufficiently comprehensive and effective at ensuring public safety. A WDU should not be required to measure chlorine residuals or HPC at the entry point. As a point of comparison, a drinking dispenser that has a carbon filter that removes the chlorine before dispensing cold water would not be subject to that type of requirement, because a WDU operates essentially as a consecutive and supplemental filtration option to the municipal water supply that includes an additional disinfection step. It is unclear why HPC should play a role given it measures heterotrophs which are a range of bacteria that are naturally present in the environment and have no direct correlation with human health. The drinking water standard for HPC is geared towards public water systems treating non-potable surface water or groundwater under the influence of surface water, which is materially different from water from WDU's which receive already treated municipal water. The quality of the WDU source water will also benefit from the recent increased chlorine residual requirements for the municipal water supply and is yet another reason the addition of HPC testing is unnecessary. (18)

Response: Section 1413 of the Federal Safe Drinking Water Act, 42 U.S.C. § 300g-2a, requires that, in order for the state to retain primary enforcement authority (primacy), the state must adopt drinking water regulations that are "no less stringent than" the national primary drinking water regulations. The federal drinking water primacy regulations at 40 CFR § 142.12(a) also require the state to adopt all new and revised national primary drinking water regulations contained in 40 CFR Part 141 in order to retain primary enforcement responsibility.

Vended, retail and bulk hauling water systems are public water systems under the federal SDWA and must comply with federal drinking water regulations. The Department acknowledges that WDUs use carbon filters to remove the residual chlorine before further treating the water with a secondary disinfectant such as ozone or UV. However, federal regulations at 40 CFR 141.72(b)(3) mandate that water systems using surface water (including GUDI) sources or that purchase water from a system that uses surface water or GUDI sources must either maintain a detectable disinfectant residual or demonstrate that HPC levels are less than 500/mL.

Therefore, the revisions related to BVRB systems using surface water or GUDI source are required by EPA to ensure Pennsylvania's regulations are no less stringent than federal standards in order for Pennsylvania to maintain primacy.

24. **Comment:** The Preamble is inaccurate, inadequate, and misleading. The terms "true detectable residual, Method Limit, Method Detection Limit and Practical Quantitation Limit" used in the Preamble are confusing and not clearly defined. The HACH© Primer does not provide sufficient justification for the proposed disinfection level of 0.2 mg/L. (4, 5, 9)

Response: See response to comment #2 and #3.

25. Comment: EPA offers the following comments regarding the proposed rule:

1. BVRB systems monitoring requirements apply to some federally regulated public water systems, and as such these provisions must be no less stringent than the federal rule. These requirements established in 1992, set monitoring requirements via the following two mechanisms:

Specific requirements defined in § 109.1003 that are different from § 109.301:

- A. The current regulation in § 109.1003 (a)(1) and § 109.1003(c) establishes monitoring requirements for bottled, retail and bulk systems, which are different from the regulations in § 109.301.
- B. The current regulation at § 109.1003(a)(2) requires vended systems to satisfy with the exception of vended systems qualifying for permit by rule.

Cross Reference to § 109.301:

- C. The current regulation § 109.1003(d) requires Bulk systems serving >25 of the same people year-round to satisfy the community water system monitoring requirements of § 109.301.
- D. The proposed Disinfection Requirements Rule states that bulk, vended or retail water systems serving at least 25 of the same people for more than six months of the year comply with the non-transient non-community water system monitoring requirements in § 109.301.

EPA would suggest revision of BVRB systems regulations for clarity and to be no less stringent than the federal rule that applies to these systems.

The following comments identify situations where BVRB systems specific monitoring in § 109.1003 are inconsistent with federal regulations. In order to receive primacy for the Stage 2 Disinfectant and Disinfection By-Products Rule, changes must occur.

2. The proposed BVRB systems monitoring requirement of § 109.1003(a)(1) does not include the compliance calculation and should clarify that Total Trihalomethanes (TTHM) or Haloacetic Acids 5 (HAA5) maximum contaminant level compliance is determined based the locational running annual average (LRAA) of quarterly samples.
3. The current analytical requirements applicable to BVRB systems as listed in § 109.1003(b)(2) are not consistent with § 109.304(c) and should be. The current safe drinking water regulation at [§ 109.1003(b)(2)] for BVRB water systems has a shorter list of excepted analysis that may be performed by someone other than an accredited laboratory (e.g., daily chlorite monitoring by BVRB is not excepted from the requirement to be performed by an accredited lab).
4. The current BVRB systems monitoring requirement of § 109.1003(a)(1)(x) requires only chlorite monitoring on a daily basis and does not allow for monthly, reduced or additional monitoring. The federal chlorite monitoring requirements of 40 CFR § 141.132(b)(2)(i)(B) and 40 CFR § 141.132(b)(2)(ii & iii) should also be required for an entry point of BVRB water systems similar to the requirements in § 109.301(12)(iii)(A)(II & III) and § 109.301(12)(iii)(B).
5. The proposed BVRB monitoring requirement of § 109.1003(a)(1)(xi) requires additional chlorine dioxide monitoring at one location on a daily basis on the day following exceedance of the maximum residual disinfectant level (MRDL) and does not meet the intent of the federal requirement. The federal chlorine dioxide monitoring requirement of 40 CFR § 141.132(c)(2)(ii) requires analysis of three additional chlorine dioxide samples, for systems with no booster chlorination, that are collected at one location at intervals of at least six hours on the day following exceedance of the MRDL.
6. The current BVRB systems monitoring requirement of § 109.1003(a)(1)(ix) lists the start date of Stage 2 monitoring as October 1, 2013 for BVRB systems and is inconsistent with federal Stage 2 monitoring start dates listed in 40 CFR § 141.620(c).

7. The current BVRB systems monitoring requirement of § 109.1003 (a)(1)(ix) lists the routine stage 2 monitoring schedule as one dual sample set per year which is inconsistent with the federal regulation and § 109.301(12)(ii)(B). The federal regulation would require routine quarterly sampling for water systems (e.g., retail system) serving more than 500 people that use or obtain water from surface water or ground water under the influence of surface water sources.

Finally, there is a different value stated for BVRB systems' entry point residual of 0.2 mg/L. This is different from § 109.202(c)(1)(ii)(B), which states the new residual at the entry point is 0.20 mg/L. While we understand that this could be the case, we wanted to ensure that a typo had not occurred. (20)

Response: To ensure that any BVRB system that meets the definition of a community or nontransient noncommunity water system is complying with both state and federal regulations, the language in Subchapter J has been revised as follows.

To address EPA's comment #1:

- Subsection 109.1003(d) has been amended to clarify the discrepancy in the cross-reference with 109.301 so that bulk water haulers must comply with the provisions of both Subchapters J and C (if a bulk water hauler meets the criteria for a community or nontransient noncommunity water system).
- Subsection 109.1003(e) has been amended to clarify the discrepancy in the cross-reference with 109.301 so that vended and retail water systems must comply with the provisions of both Subchapters J and C (if the criteria for a nontransient noncommunity water system is met). Vended and retail water systems do not meet the definition of a community water system because they cannot serve as the primary potable water supply for year-round residents.

To address comment #2 and #7, subparagraph 109.1003(a)(1)(ix) has been amended to include the compliance determinations for total trihalomethanes and haloacetic acids. Language was also added to clause 109.1003(a)(1)(ix)(A) to ensure that water systems meeting the definition of a community or nontransient noncommunity water system are complying with the monitoring requirements of 109.301(12)(ii).

To address comment #3, paragraph 109.1003(b)(2) has been amended to be consistent with the language in 109.304 so that daily chlorite measurements may be conducted by someone other than an accredited laboratory.

In response to comment #4, the language in subparagraph 109.1003(a)(1)(x) is already consistent with and more stringent than federal requirements. BVRB systems do not have a distribution system in which to conduct monthly monitoring or monitoring after an entry point exceedance. Therefore, reduced monitoring is not allowed. The existing language does require 3 additional samples within 24 hours (as is specified in the federal rule) from the same lot, batch, machine, carrier vehicle or point of delivery which are the only sampling locations available to BVRB systems.

To address comment #5, subparagraph 109.1003(a)(1)(xi) has been amended to ensure the monitoring and compliance determinations for chlorine dioxide are at least as stringent as the federal regulations. BVRB systems do not have a distribution system in which to conduct monitoring after

an entry point exceedance; therefore, MRDL compliance is based on the results from entry point samples, which is more stringent than the federal regulations.

In response to comment #6, the start dates for compliance monitoring specified in the federal Stage 2 DBPR do not apply to BVRB systems in Pennsylvania because when Subchapter J was revised in 2009 to include the provisions of the Stage 2 Disinfectants/ Disinfection Byproducts Rule (Stage 2 rule), no BVRB systems existed in Pennsylvania that qualified as a community or nontransient noncommunity water system. Therefore, none of the BVRB systems were subject to the federal regulations. Because none of the BVRB systems were subject to the federal regulations at the time of the Stage 2 rule implementation date, the compliance start date for BVRB systems was determined to be equivalent to a schedule 4 water system. This initial compliance date has since passed for all water systems in existence at the time of the Stage 2 rule implementation date, and any new BVRB system will be required to comply with provisions at least as stringent as the federal regulations.

Additionally, to date, none of the BVRB systems in Pennsylvania qualify as a community or nontransient noncommunity water system, so BVRB systems are currently complying with Stage 2 rule requirements that are more stringent than the federal regulations.

Regarding EPA's final comment, the entry point residual level of 0.2 mg/L was a typographical error. It should have been 0.20 mg/L to be consistent with the provisions of § 109.301. The text has been corrected.

26. Comment: Effective date of rulemaking. — Implementation procedures. Commentators request that EQB defer the effective date of the rulemaking to at least six months to 24 months after final promulgation. They state that additional time is needed for capital improvements, proper budgeting, planning, and training. Some commentators suggest adding a provision that would allow water systems to make requests for extended compliance schedules under certain circumstances. We acknowledge that EQB is specifically seeking input on when certain provisions of the rulemaking should become effective. We ask the EQB to continue to work with the regulated community to develop a schedule for implementing this rule that adequately protects the health, safety and welfare of the public, while at the same time, minimizing the fiscal impact it will have on water systems.
(21)

Response: The effective dates for distribution disinfectant residual requirements have been deferred for one year in response to public comments. Please also see response provided to comment #12.

27. Comment: Section 109.202. State MCLs, MRDLs and treatment technique requirements. — Fiscal impact; Reasonableness; Need. EQB is proposing to amend Section 109.202(c)(1)(ii) to clarify the existing minimum residual disinfectant level at the entry point by adding a zero to the minimum level (0.20 mg/L). EQB explains that 0.20 mg/L is needed to ensure an adequate disinfectant residual in the water entering the distribution system and that the level of sensitivity is consistent with other Department of Environmental Protection (DEP) values. The Small Water Systems Technical Advisory Center (TAC) to DEP recommended the minimum entry point residual remain at 0.2 mg/L because water systems using strip chart recorders may not be able to record data to two decimal places and would need to upgrade to supervisory control and data acquisition (SCADA) systems. Commentators are in agreement with the TAC and question whether DEP's estimate to upgrade to electronic recording devices of \$1,500 per system includes costs for installation and connection to SCADA systems. In the final-form Preamble and RAF, EQB should provide specific estimates of all the costs associated with compliance and an explanation of how the estimates were

derived. In addition, the Board should provide further explanation concerning the benefits of the regulation as compared to the costs. (21)

Response: Please see the response provided to comment #10. Some commentators mistakenly believed that all paper chart recorders will need to be replaced and that these recorders must be connected to a SCADA (or similar) system. SCADA systems are not mandated in the proposed rule. The majority of water systems using paper strip chart recorders will be able to switch the resolution of the paper charts used and adjust their existing equipment to record 2 decimal places. The cost estimates have been further explained in the Order and Regulatory Analysis Form for the very few systems that will need to replace equipment.

28. Comment: Section 109.301. General monitoring requirements. — Reasonableness; Fiscal impact. This section sets forth performance monitoring requirements for public water suppliers. Section 109.301(1)(i)(D)(II) requires a public water supplier to monitor the disinfectant residual at representative locations in the distribution system at least once per week. Commentators believe the additional residual monitoring from once a month to once a week will increase operating costs for small water systems. They recommend monitoring at the same frequency and schedule as the Revised Total Coliform Rule (RTCR). In the Preamble to the final-form regulation, EQB should explain the reasonableness of requiring weekly monitoring, and how the potential benefits outweigh any costs associated with it. (21)

Response: Please see response provided to comment #4. Small water systems will not need to increase operating costs because on-site personnel using a Standard Operating Procedure may conduct disinfectant residual measurements. The same on-site person conducting the daily entry point disinfectant residual measurements (required under existing regulations) will also be able to conduct the weekly measurements in the distribution system. Language explaining this is included in the Order for the rulemaking under Compliance Costs. Any costs to the regulated community are offset by the avoidance of waterborne disease outbreaks. If even one waterborne disease outbreak is avoided each year, the cost savings to the regulated community (residents and businesses) is estimated at \$1.5 million, with an additional \$1.1 million in savings to local, state and nongovernmental agencies, healthcare facilities and schools.

29. Comment: Section 109.710. Disinfectant residual in the distribution system. — Reasonableness; Protection of the public health, safety and welfare; Fiscal impact; and Implementation procedures. Minimum disinfectant residual. EQB is proposing to increase the minimum residual in the distribution system to 0.2 mg/L free or total chlorine from the current level 0.02 mg/L. EQB explains that the distribution systems remain a source of contamination that has yet to be fully addressed and that the existing 0.02 mg/L is inadequate to protect against microbial growth within the distribution system.

Despite the data provided in the Preamble by the EQB, commentators remain unclear as to which public health concern the EQB is addressing by raising the residual limit in the distribution system. Commentators also expressed concern that the new residual standard would likely increase the formation of disinfection byproducts (DBPs) which have known health risks. In the Preamble to the final-form regulation, EQB should explain what specific public health issue is being addressed by the proposed disinfectant residual that is not currently being handled by the RTCR or isn't a premise plumbing concern. EQB should also explain what measures exist to safeguard against increases in DBPs.

Costs

The fiscal analysis provided in the RAF indicates that the total estimated cost to the regulated community is \$823,500. The regulated community believes DEP has overestimated the number of water suppliers that would be in compliance with the proposed residual and has underestimated capital and operational costs. For example, Philadelphia Water estimated \$25 million dollars in capital costs and \$2.5 million dollars in annual operating and maintenance costs. The Borough of Carlisle estimates capital costs ranging from \$115,000 to \$190,000 to potentially comply with a 0.2 mg/L free chlorine requirement. As EQB develops the final-form regulation, we ask that they reach out to the regulated community to gain a better understanding of the potential costs associated with the new requirements and to include those revised costs in the RAF submitted with regulatory package.

Tier 2 Public Notification

Subparagraph (c)(3) requires water utilities to issue a Tier 2 public notification for all results not meeting the proposed 0.2 mg/L minimum limitation. Several municipal water authorities have stated that because no known health risks have been identified in the proposed rulemaking, requiring water utilities to issue Tier 2 public notices for failing to meet 0.2 mg/L will erode public confidence in water quality. Commentators disagree that the proposed minimum disinfectant residual is practical and achievable. They believe additional notifications could lead to overuse of public notifications. In the Preamble to the final-form rulemaking, we ask EQB to explain why public notification is needed when the minimum disinfectant residual is not maintained in the distribution system and why the benefits of such a notice outweigh any potential costs associated with such notice.

Heterotrophic plate count (HPC)

EQB is proposing to delete Subsection (b) which requires a public water system that uses surface water or groundwater under direct influence of surface water (GUDI) sources or obtains finished water from another permitted public water system using the surface water or GUDI to collect Heterotrophic Plate Count (HPC) measurements. TAC recommends retaining HPC monitoring as an alternative compliance criteria. Supporters view it as a tool that can alert operators to a problem before sample locations actually present with a positive Total Coliform or E.coli sample. They argue removing this provision may weaken public health protections. Others remarked that HPC is allowed under the federal regulations and retaining it will reduce the number of instances where public notice is required. We note that the EQB has asked for comments with references to studies, reports or data comparing whether HPC less than 500 provides the same level of public health protection as a disinfectant residual of 0.2mg/L. In the Preamble to the final-form rulemaking, we ask the EQB to explain its rationale for removing this provision. We will consider EQB's response to comments and any changes made to this subsection in our review of the final-form regulation to determine whether it is in the public interest. (21)

Response: With regard to the 0.2 level, please see the response provided to comments #3 and #5.

With regard to the cost of the regulation, please see the response provided to comment #5.

With regard to the Tier 2 PN, please see the response provided to comment #9.

With regard to HPC, please see the response provided to comment #8.

30. **Comment:** Section 109.1003. Monitoring requirements. — Reasonableness; Clarity; Possible conflict with other statutes or existing regulations. Section 109.1003(a)(1)(xiv) requires that bottled, bulk and retail water systems that use or purchase water from a system that uses surface water or GUDI sources must also meet the minimum distribution system disinfection residual requirements. EQB states these revisions are in response to the United State Environmental Protection Agency's

(EPA) comments to obtain primacy for Long Term 2 Enhanced Surface Water Treatment Rule. Water dispensing unit (WDU) operators commented that adding the HPC test alongside the Total Coliform test is duplicative and adds unnecessary costs. They further point out the drinking water standard for HPC is geared toward public water systems treating non-potable surface water or GUDI and that it should not apply to WDUs which receive already treated municipal water. We ask EQB to explain in the RAF and Preamble of the final-form regulation the reasonableness of requiring water dispensing units to meet the same disinfection residual requirements as public water systems.

The EPA submitted comments that identify several instances where the Bottled Water and Vended Water Systems, Retail Water Facilities and Bulk Water Hauling Systems (BVRB) monitoring provisions are inconsistent with federal regulations and must be changed to obtain primacy. The EPA also seeks clarification on the BVRB entry point residual. We will review the EQB's response to the EPA's comments and any changes made to this section in our review of the final-form rulemaking to determine whether it is in the public interest. (21)

Response: Please see the response provided to comments # 23 and 25. The disinfection requirements for BVRB systems are necessary to maintain primacy. The language relating to the Stage 2 DBPR in Subchapter J has been revised. The entry point disinfectant residual level has been corrected.

References:

Colorado Department of Public Health and Environment (April 2014). "Draft-Minimum Distribution System Disinfection Residuals: Chlorine Residual Values Reported from Within Drinking Water Distribution Systems".

DEP, Pennsylvania Drinking Water Information System online database.

EPA (June 2002). "Health Risks from Microbial Growth and Biofilms in Drinking Water Distribution Systems." Distribution System White Paper:

http://www.epa.gov/safewater/disinfection/tcr/regulation_revisions.html

EPA (April 2010). "Final—Priorities of the Distribution System Research and Information Collection Partnership."

EPA (December 2016). "Six-Year Review 3 Technical Support Document for Microbial Contaminant Regulations." EPA 810-R-16-010.

LeChevallier, M. W., et al. (1996). "Full-Scale Studies of Factors Related to Coliform Regrowth in Drinking Water." *Applied and Environmental Microbiology*, 62(7), p. 2201.

Wahman, D. G. and Pressman, J. G. (2015). "Distribution System Residuals—Is 'Detectable' Still Acceptable for Chloramines." *Journal—American Water Works Association*, 107(8), p. 53.



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

August 25, 2017

Ms. Lisa Daniels, Director
Bureau of Safe Drinking Water
P.O. Box 8467
Harrisburg, PA 17105-8467

**RE: Comments on the Draft Final-Form Disinfection Requirements Rule
(Chapter 109 – Safe Drinking Water)**

Dear Ms. Daniels:

The Small Water Systems Technical Assistance Center (TAC) Advisory Board met on July 13 & August 24, 2017 to discuss the draft Final-Form Disinfection Requirements Rule. The TAC Board approved the following comments at the August 24, 2017 meeting:

1. DEP should modify the proposed language to identify whether the distribution system disinfection sample site is located within the mixing zone. The motion passed by a unanimous vote.
2. DEP should modify the distribution system disinfection language to address monitoring locations and compliance calculations for mixing zones and for chloraminating systems conducting a free chlorine burn. The motion passed by a unanimous vote.
3. DEP should add language to clarify that multiple grab sample measurements from the same location during the monitoring period will be averaged by DEP into a monthly compliance value for that location. The motion passed by a unanimous vote.
4. Water systems using continuous analyzers for distribution system disinfection residual measurements as described in their monitoring plan should calculate a daily average to be reported to the Department. The motion passed by a unanimous vote.
5. DEP should allow alternate compliance schedules (regarding the compliance date for the distribution system disinfection minimum level) to be approved in writing if the water supplier submits a written request with supporting documentation within 1 year after the effective date of the final rule. The motion passed by a unanimous vote.
6. DEP should delay any new regulation update on Chapter 109 until the Safe Drinking Water Program is at full complement and current regulations are uniformly enforced. The motion passed by a vote of 9 to 5.
7. The deadline for developing the nitrification control plan should be delayed for 1 year after the effective date of the final rule. The motion passed by a vote of 12 to 2.

8. DEP should conduct a disinfection byproduct evaluation to determine the impacts of increasing the chlorine residual in the distribution system using data only from Pennsylvania water systems. The motion passed by a voice majority vote.
9. DEP should retain the compliance calculations as proposed for water systems serving a population of 33,000 or less. The motion passed by a voice majority vote; there was 1 nay.

Thank you for the opportunity to comment.

Sincerely,

DocuSigned by:

5328E326449B42A...

Mr. Robert Boos
Vice-Chairman

January 22, 2018

David Sumner
Executive Director
Independent Regulatory Review Commission
333 Market Street, 14th Floor
Harrisburg, PA 17120

Re: Final-Omitted Rulemaking: Administration of the Land Recycling Program (#7-538)
Final Rulemaking: Gasoline Volatility Requirements (#7-529)
Final Rulemaking: Disinfection Requirements Rule (#7-520)

Dear Mr. Sumner:

Pursuant to Section 5(a) of the Regulatory Review Act, please find enclosed copies of one final-omitted rulemaking and two final-form rulemakings for review and comment by the Independent Regulatory Review Commission (IRRC). The Environmental Quality Board (Board) adopted these rulemakings at its December 12, 2017 meeting.

The **Administration of the Land Recycling Program (#7-538)** final-omitted rulemaking is being made under the authority of section 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P.S. §§ 6026.303(a)), known as “Act 2,” which directs the Environmental Quality Board (EQB) to promulgate Statewide health standards for regulated substances for each environmental medium and the methods used to calculate the standards. Section 303(c) of Act 2 requires the Department of Environmental Protection (Department) to develop risk-based Statewide health standards using valid scientific methods, reasonable exposure pathways assumptions and exposure factors for residential and nonresidential land use which are no more stringent than the standard default exposure factors established by EPA.

The amendments included in this final-omitted rulemaking correct transcription and input errors for the toxicity values for Aldrin, beryllium, and cadmium in 25 Pa. Code Chapter 250, Appendix A, published at 46 Pa.B. 5655 (August 27, 2016), which resulted in the calculation of incorrect Statewide health standard Medium Specific Concentrations (MSCs). This final-omitted rulemaking does not change the method by which the calculation is made.

These corrections to the Land Recycling Program regulations will affect owners, operators and purchasers of properties and facilities who volunteer or are required to perform remediation of contaminated sites. This rulemaking is not expected to add costs, overall, to the cleanup of contaminated sites under this program. The decrease in the Aldrin MSC will only impact ten sites. Remediators of these sites can use either the background standard or the site-specific standard if the reduction in the Aldrin MSC impacts their project. The beryllium and cadmium corrections result in increases in their respective MSC values and are not anticipated to have an adverse impact on the regulated community.

This final-omitted rulemaking was discussed with and received the support of the Cleanup Standards Scientific Advisory Board (CSSAB) at its November 16, 2016, meeting.

Public notice and comment procedures may be omitted under section 204 of the Commonwealth Documents Law (45 P.S. § 1204) when they are unnecessary or contrary to the public interest. For this rulemaking, a public comment period is not necessary, as public comment would not alter the need to correct these errors. In addition, these corrections will ensure that any remediation of Aldrin, beryllium, or cadmium conforms to current science relating to the protection of human health and is consistent with the requirements of Chapter 250, which is in the public interest.

The **Gasoline Volatility Requirements (#7-529)** final-form rulemaking is designed to address the legislative mandate to the Board to promulgate regulations to rescind 25 Pa. Code Chapter 126, Subchapter C (relating to gasoline volatility requirements). Act 50 of 2014 (P.L. 674, No. 50), amended the Pennsylvania Air Pollution Control Act to add section 4(18.3), which requires the Department to “[W]ithin sixty (60) days of the effective date of this clause, initiate the process of amending the State implementation plan. Upon approval of a revision which demonstrates continued compliance with Federal national ambient air quality standards through utilization of commensurate emission reductions by the Environmental Protection Agency, the board shall promulgate regulations to repeal the provisions of 25 Pa. Code Ch. 126 Subch. C (relating to gasoline volatility requirements).” Section 4(18.3) was effective May 14, 2014. The Senate Co-Sponsorship Memorandum for Act 50 indicates that the impetus for directing the Department to begin the process of revising the State Implementation Plan (SIP) was to reduce the costs of gasoline to consumers in the area.

The Chapter 126, Subchapter C requirements for gasoline with a Reid vapor pressure (RVP) of 7.8 pounds per square inch (psi) or less (low RVP gasoline) to be sold or transferred into or within the Pittsburgh-Beaver Valley Area, between May 1 and September 15 of each year for refiners, importers, distributors, resellers, terminal owners and operators and carriers and between June 1 and September 15 of each year for retailers and wholesale purchaser-consumers. were promulgated at 27 Pa.B. 5601 on November 1, 1997. These requirements were approved by the U.S. Environmental Protection Agency (EPA) at 63 FR 31116 on June 8, 1998, as a revision to the Commonwealth’s State Implementation Plan (SIP) codified in the Code of Federal Regulations (CFR) at 40 CFR 52.2020—52.2063 (Subpart NN – Pennsylvania), effective July 23, 1998, as a Federally-enforceable control measure to help attain and maintain the 1-hour Ozone National Ambient Air Quality Standards (NAAQS) in the Pittsburgh-Beaver Valley Area to protect the public health and welfare. The Pittsburgh-Beaver Valley Area includes Allegheny, Armstrong, Beaver, Butler, Fayette, Washington, and Westmoreland Counties.

In response to a comment from the Independent Regulatory Review Commission (IRRC), this final-form rulemaking changes the action of the proposed rulemaking from rescinding Chapter 126, Subchapter C. This final-form rulemaking retains §§ 126.301–126.303 and adds subsection (d) to § 126.301, which reads as follows: “This subchapter will no longer be applicable to the Pittsburgh-Beaver Valley Area upon the effective date of approval by the EPA of the removal, suspension or replacement of this subchapter as a part of the Commonwealth’s SIP.”

The four terms and definitions proposed for deletion from § 121.1 (relating to definitions) are retained in this final-form rulemaking, since the final-form rulemaking does not rescind §§ 126.301—126.303.

This approach of amending rather than rescinding Chapter 126, Subchapter C as proposed ensures that EPA approval of the Non-Interference Demonstration SIP revision will occur prior to (or coincident with) Chapter 126, Subchapter C becoming no longer effective as a regulation in the *Pennsylvania Code*. Upon promulgation of the final-form rulemaking and EPA approval of the Department's Non-Interference Demonstration SIP revision, Chapter 126, Subchapter C will no longer be applicable for the Pittsburgh-Beaver Valley Area. The Department will publish a notice in the *Pennsylvania Bulletin* to inform the public immediately following SIP approval. After publication of the *Pennsylvania Bulletin* notice, the Department plans to remove Chapter 126, Subchapter C from the *Pennsylvania Code* through a separate rulemaking to repeal it.

The coordination of this current final-form rulemaking and the Non-Interference Demonstration SIP submittal will ensure that affected entities will not be at risk of enforcement proceedings at either the Federal or the Commonwealth level upon the effective date of EPA approval of the Non-Interference Demonstration and will achieve the objectives of Act 50.

When §§ 126.301—126.303 are no longer applicable as a result of the EPA approving the Non-Interference Demonstration SIP revision, certain parties will be affected. Businesses involved in the sale of gasoline, including gas stations, bulk terminals, and wholesalers, may see some economic benefit from the elimination of the requirement to obtain and sell gasoline with an RVP of 7.8 psi or less if the cost savings of blending the specialty fuel are passed down the chain from the refinery and terminal to the retail gas station. Cost savings at refineries may be as much as 0.5 cents per gallon (cpg). Cost savings for retailers and wholesale purchaser-consumers may be as much as 1.4 – 3.2 cpg. Additionally, cost savings for state and local government and for public consumers may be as much as 1.6 – 9.2 cpg. However, end-users may or may not see a cost savings at the retail pump. Businesses involved in gasoline transport and storage may see some cost reductions, due to the increased efficiency resulting from not having to segregate the 7.8 psi RVP gasoline. Recordkeeping requirements for all affected entities may be reduced or simplified, since the businesses will no longer be required to document the transfer of gasoline with an RVP of 7.8 psi.

The proposed rulemaking was approved by the EQB at its meeting of October 18, 2016, and published in the *Pennsylvania Bulletin* on February 25, 2017, with a 66-day public comment period (47 Pa.B. 1157). Three public hearings were held on March 28, 29, and 30, 2017, in Pittsburgh, Norristown, and Harrisburg, respectively. The public comment period closed on May 1, 2017. Written comments were received from members of the public, the regulated industry, members of the Pennsylvania House of Representatives, and the Independent Regulatory Review Commission (IRRC). Most members of the public, as well as the Representatives, expressed support for the proposed rulemaking. One commentator expressed concerns and asked for information about the commensurate emission reductions that would be used to demonstrate continued compliance with the NAAQS. As previously noted, IRRC expressed concerns about the Board's plan for implementing Act 50 and the consistency of this

plan with Act 50. The comments and concerns have all been addressed in this final-form rulemaking.

The Air Quality Technical Advisory Committee (AQTAC) was briefed on this final-form rulemaking on June 15, 2017. The members of AQTAC voted 12-2-1 to concur with the Department's recommendation to move this final-form rulemaking forward to the Board for consideration. The two AQTAC members who were opposed did not provide concerns or comments at this meeting. The Small Business Compliance Advisory Committee (SBCAC) was briefed on this final-form rulemaking on July 26, 2017. The members of the SBCAC voted unanimously to concur with the Department's recommendation to move this final-form rulemaking forward to the Board for consideration. This final-form rulemaking was discussed with the Citizens Advisory Council (CAC) Policy and Regulatory Oversight Committee on June 27, 2017. On the recommendation of that Committee, the members of the CAC concurred on September 19, 2017, with DEP's recommendation to forward this final-form rulemaking to the Board.

The **Disinfection Requirements Rule (#7-520)** final-form rulemaking amends Safe Drinking Water regulations in 25 Pa. Code Chapter 109 to strengthen water system requirements relating to microbial protection and disinfection. These amendments will protect public health through a multi-barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and by ensuring the integrity of drinking water distribution systems. Safe drinking water is vital to maintaining healthy and sustainable communities. Proactively avoiding incidents such as waterborne disease outbreaks can prevent loss of life, reduce the incidence of illness, and reduce health care costs. Proper investment in public water system infrastructure and operations helps ensure a continuous supply of safe drinking water; enables communities to plan and build future capacity for economic growth; and ensures their long-term sustainability for years to come.

The amendments include minor clarifications to the Stage 2 Disinfectants/ Disinfection Byproducts Rule (Stage 2 DBPR), Long Term 2 Enhanced Surface Water Treatment Rule (LT2) and the Lead and Copper Rule Short-Term Revisions (LCRSTR) to obtain or maintain primacy.

The amendments also include new monitoring and reporting requirements to ensure compliance with an *existing* treatment technique regarding log inactivation. The proposed amendments also clarify that the minimum residual disinfectant level at the entry point is 0.20 mg/L to ensure water suppliers will maintain a residual that is equal to or greater than 0.20 mg/L. Currently, levels of 0.15 mg/L or higher round up to 0.2 mg/L and are considered in compliance. A level of 0.20 mg/L is necessary due to the importance of meeting log inactivation and of maintaining an adequate disinfectant residual in the water entering the distribution system. Log inactivation and entry point disinfectant residual requirements are existing Federal requirements in 40 CFR 141.72(b) (relating to disinfection).

The amendments will also strengthen the distribution system disinfectant residual requirements by increasing the minimum residual in the distribution system to 0.2 mg/L free or total chlorine. DEP's existing disinfectant residual treatment technique requirement for distribution systems has not been substantially updated since 1992 and requires the maintenance of a detectable residual

that is defined as 0.02 mg/L. This treatment technique is not protective of public health because a residual of 0.02 mg/L does not represent a true detectable residual and the level is inadequate to protect against microbial growth within the distribution system.

Language has been added to the final-form rule to clarify the monitoring and compliance determinations for the distribution system disinfectant residual treatment technique. Language has also been added to defer implementation for the distribution system disinfectant residual requirements in response to advisory committee and public comments. The disinfectant residual sampling plan has been deferred for six months; and the nitrification control plan and monitoring, reporting and treatment technique requirements for the disinfectant residual in the distribution system have been deferred for one year.

Additional language was included for bottled, vended, retail and bulk water hauling systems in response to comments from EPA to ensure state regulations are at least as stringent as federal regulations.

These amendments will affect all 1,949 community water systems and those noncommunity water systems that have installed disinfection (746) for a total of 2,695 public water systems. These public water systems serve a total population of 11.3 million people. All 1,949 community water systems (CWS) and 746 noncommunity water systems (NCWS) are affected by at least one of these provisions as follows:

1. Revisions relating to log inactivation for surface water and groundwater under the direct influence of surface water (GUDI) filter plants will apply to all 353 filter plants which are operated by 319 water systems. Water suppliers should already be monitoring the data elements used in log inactivation calculations because this data is needed to properly operate filtration plants. Costs associated with the new reporting requirements should be minimal due to the availability of EPA's CT Calculator tool (CT is the product of residual disinfectant concentration (C) and disinfectant contact time (T)) and the use of summary forms for reporting data for compliance purposes.
2. Revisions to the disinfectant residual requirements affect all 1,949 CWS, 607 nontransient noncommunity water systems (NTNCWS) that have installed chemical disinfection, and 139 transient noncommunity water systems (TNCWS) that have filtration for SW or GUDI sources or that have installed 4log disinfection of groundwater sources for a total of 2,695 PWSs.

The draft proposed rulemaking was originally included in the Draft Proposed Revised Total Coliform Rule (RTCR), which was presented to the TAC on June 18, and September 23, 2014, for review and comment. On April 21, 2015, the EQB approved the proposed RTCR with modifications which included separating the non-RTCR provisions for additional stakeholder input. Additional TAC meetings were convened on May 18, May 26, June 16, and June 30, 2015. During these meetings, 14 water systems and organizations delivered presentations to help inform the discussion. Two additional meetings were held with large water systems on June 29, and July 16, 2015. As a result of these additional stakeholder meetings, several revisions were made during the rulemaking development, including revisions to the minimum required

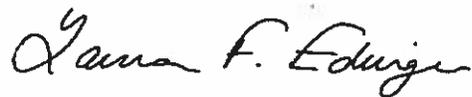
disinfectant residual levels, monitoring and reporting requirements, and compliance determinations. The TAC provided a final set of recommendations on July 15, 2015 and the proposed rule was approved by the EQB on November 17, 2015.

The proposed rulemaking was published on February 20, 2016, with a 60-day public comment period. Public hearings were held in Harrisburg on March 28, 2016, in Norristown on April 5, 2016, and in Pittsburgh on April 7, 2016. Twenty public commentators and the Independent Regulatory Review Commission provided comments on the proposed rulemaking. The final-form rulemaking was presented to the TAC Board on July 13 and August 24, 2017. As a result of the TAC recommendations and public comments received, several revisions were made to the proposed rulemaking, including deferred implementation dates and additional clarification for the distribution system disinfectant residual monitoring requirements.

The Department will provide assistance as necessary to facilitate IRRC's review of the enclosed rulemakings under Section 5.1(e) of the Regulatory Review Act.

Please contact me by e-mail at ledinger@pa.gov or by telephone at 717.783.8727 if you have any questions or need additional information.

Sincerely,

A handwritten signature in cursive script that reads "Laura F. Edinger".

Laura Edinger
Regulatory Coordinator

Enclosures

**TRANSMITTAL SHEET FOR REGULATIONS SUBJECT TO
 THE REGULATORY REVIEW ACT**

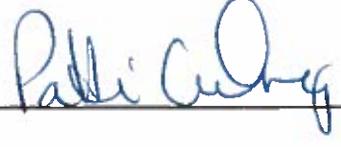
I.D. NUMBER: 7- 520
 SUBJECT: Disinfection Requirements Rule
 AGENCY: DEPARTMENT OF ENVIRONMENTAL PROTECTION

TYPE OF REGULATION

- Proposed Regulation
- Final Regulation
- Final Regulation with Notice of Proposed Rulemaking Omitted
- 120-day Emergency Certification of the Attorney General
- 120-day Emergency Certification of the Governor
- Delivery of Tolled Regulation
 - a. With Revisions
 - b. Without Revisions

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 IRRC
 2018 JAN 22 P 4: 28

FILING OF REGULATION

DATE	SIGNATURE	DESIGNATION
1-22-18		Majority Chair, HOUSE COMMITTEE ON ENVIRONMENTAL RESOURCES & ENERGY Representative John Maher
1/22/18		Minority Chair, HOUSE COMMITTEE ON ENVIRONMENTAL RESOURCES & ENERGY Representative Mike Carroll
1/22/18		Majority Chair, SENATE COMMITTEE ON ENVIRONMENTAL RESOURCES & ENERGY Senator Gene Yaw
1/22/18		Minority Chair, SENATE COMMITTEE ON ENVIRONMENTAL RESOURCES & ENERGY Senator John Yudichak
1/22/18		INDEPENDENT REGULATORY REVIEW COMMISSION David Sumner
_____	_____	ATTORNEY GENERAL (for Final Omitted only)
_____	_____	LEGISLATIVE REFERENCE BUREAU (for Proposed only)

