

**State of Delaware  
Public Drinking Water  
Annual Compliance  
Report and Summary  
for 2015**



*DELAWARE HEALTH AND SOCIAL SERVICES*

Division of Public Health

## Acknowledgements

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This report was prepared by the Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water.

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*DELAWARE HEALTH AND SOCIAL SERVICES*  
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## Executive Summary

The State of Delaware Public Drinking Water Annual Compliance Report and Summary for 2015 details the compliance of all public water systems in Delaware for the 2015 calendar year. This report provides both the Environmental Protection Agency (EPA), and the public, information on the performance of water systems in Delaware regarding their ability to provide safe drinking water to the public in accordance with the guidelines set by the Safe Drinking Water Act. Submission of this annual report is a mandatory requirement by the EPA.

This report summarizes the performance and compliance of all public water systems for the 2015 calendar year. It gives the EPA and the public a descriptive overview of all public water systems in Delaware and their compliance status. This report is made available to the public through the Division of Public Health (DPH), Office of Drinking Water (ODW) website: <http://www.dhss.delaware.gov/dhss/dph/hsp/pubdw.html>.

The number of total coliform violations for 2015 compared to 2014 remain roughly the same. There was an increase in the number of monitoring and reporting violations under the Lead and Copper Rule and the Consumer Confidence Report (CCR) Rule. There was a decrease in the number of systems that had action level exceedances under the Lead and Copper Rule. Overall, the quality of water supplied by public water systems in the state of Delaware was found to meet the requirements of the Safe Drinking Water Act.

## The Office of Drinking Water Program: An Overview

In 1974, the U.S. Congress adopted the Safe Drinking Water Act (SDWA). The United States Environmental Protection Agency (EPA) established the Public Water System Supervision (PWSS) program under the authority of the SDWA to regulate drinking water provided by public water systems. Under the SDWA and the 1986 and 1996 amendments, the EPA set national limits on drinking water contaminant levels to ensure water is safe for human consumption. These limits are known as maximum contaminant levels (MCLs). The State of Delaware adopted these limits for use in state regulations governing drinking water.

The SDWA allows a state to seek Primacy, EPA approval to administer its own PWSS program. The State of Delaware was granted Primacy in April 1978. For Delaware to continue to receive Primacy, it must meet certain SDWA requirements, including adopting drinking water regulations that are at least as stringent as the federal regulations. The State must also demonstrate that it can enforce the program requirements. The entity responsible for monitoring and enforcement of drinking water regulations is the state Division of Public Health (DPH) Office of Drinking Water (ODW).

The SDWA, EPA regulations, and state regulations require that all public water systems (PWS) monitor the drinking water for contaminants. Generally, the larger the population served by the water system, the more frequently the monitoring must occur. If a PWS violates an MCL, or fails to conduct monitoring, the system must notify the public of the violation.

Due to Delaware's small size, the ODW- traditionally conducts most monitoring for public water systems. A few of the larger water systems conduct their own monitoring and report the results to ODW. Due to the increase in monitoring requirements in recent years, ODW requires community water systems serving more than 1,000 people to collect their own total coliform, nitrate, and monthly fluoride compliance samples. Such community water systems must submit those samples to the Delaware Public Health Laboratory (DPHL) or a properly certified private laboratory for analysis. They must then submit the results to ODW. All community water systems (cities, towns, mobile home parks, etc.) and the non-transient, non-community water systems (schools, daycares, factories, etc.) are required to collect samples for compliance with national lead and copper rule standards. The samples are analyzed by a certified laboratory and the results submitted to ODW. Transient, non-community water systems (restaurants, parks, rest stops, etc.) are not required to conduct lead and copper monitoring.

The 1996 amendments to the SDWA included a requirement for states to prepare an annual compliance report in accordance with Section 1414(c)(3)(A)(i) and distribute the report as specified in Section 1414(c)(3)(A)(ii). This report provides an annual representation of the number of violations in these categories: MCLs, treatment techniques, and significant monitoring violations. Delaware does not permit variances and exemptions; therefore, it does not report these categories.

*The 2015 Annual Compliance Report and Summary (ACR) covers the period of Jan. 1 to Dec. 31, 2015. ODW staff generated the data in this report. Violation information comes from the Safe Drinking Water Information System/State (SDWIS/State) version and the federal operational data system, and includes information reported quarterly to the EPA.*

## State Public Drinking Water Summary, Delaware 2015

This document provides a brief overview of the state's public drinking water in 2015. Its contents range from general information, to violations by contaminant and by water system. For additional information or clarification, contact ODW at 302-741-8630.

**Figure 1. Population and Land Usage in Delaware, 2015**

Total land area of Delaware	1,356,186 acres <sup>1</sup>		Population of Delaware	941,634 <sup>2</sup>
Forest/Forested Wetlands	370,430 acres	(27%)	Percent served by individual wells	22.6
Agriculture	500,159 acres	(37%)	Percent served by public water supplies	77.4
Developed	278,804 acres	(21%)	Primacy granted to state by EPA	1978
Wetland/Water/Waterways	206,793 acres	(15%)		

<sup>1</sup> Source: Delaware Office of State Planning Coordination.

<sup>2</sup> Source: Delaware Population Consortium.

<b>Figure 2. Drinking Water Sources Delaware, 2015</b>	<b>Figure 3. Public Water Systems, Delaware, 2015</b>	
<b>Major Sources of Surface Water</b>	<b>Residents served by public water systems<sup>1</sup></b>	<b>728,879</b>
Brandywine River Basin		
Christina River Basin	Residents served by surface water systems	241,736
Red Clay/White Clay Creeks	Residents served by ground water systems	484,371
<b>Major Sources of Ground Water</b>	<b>Number of public water systems</b>	<b>493</b>
Columbia Aquifer	Community systems	214
Cheswold Aquifer	Non-transient systems	89
Piney Point Aquifer	Transient systems	190
Number of gallons of public water used in Delaware each day: 101 mgd <sup>2</sup>	Number using surface water	3
	Number using ground water	490

<sup>1</sup> Source: Safe Drinking Water Information System/State Version (SDWIS/State), Delaware Department of Health and Social Services, Division of Public Health.

<sup>2</sup> Million Gallons per Day (mgd<sup>2</sup>) Source: Delaware Department of Natural Resources and Environmental Control.

## Definitions

**Community Water System** means a public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

**Non-Transient Non-Community Water System** means a public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year.

**Transient Non-Community Water System** means a public water system which has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year.

**Surface Water** means all water which is open to the atmosphere and subject to surface runoff.

**Groundwater** means all water held underground in the soil or pores and crevices in rocks. The ODW provides many services to consumers and public water supply systems. Funding comes from both state and federal monies allotted to Delaware's public drinking water program. The ODW and the DPHL use these funds to provide services for the drinking water program.

## State Public Drinking Water Summary, 2015, Continue

To ensure that Delaware's drinking water meets or exceeds SDWA requirements, ODW reviews and approves plans for new or existing water treatment systems and/or new or upgraded distribution systems. ODW staff also inspect water systems, provides technical assistance, responds to emergencies, makes compliance determinations based on monitoring results, and takes enforcement actions when necessary. ODW provides training to water system operators and owners regarding system operation and compliance with rules and regulations. Additionally, ODW contracts with the Environmental Training Center at Delaware Technical Community College and the Delaware Rural Water Association to provide training and additional technical assistance to water system operators.

In January 2006, DPH began requiring individuals who collect compliance samples or conduct daily monitoring of a public water system, to be either a licensed operator or certified as an approved sampler/tester. This requirement helps to ensure the integrity of the sampling.

The DPHL performs analyses for water quality parameters as outlined in the SDWA. ODW also contracts with private laboratories for analysis of some regulated parameters such as pesticides and herbicides.

<b>Figure 4. Operations of the Delaware Office of Drinking Water, 2015</b>	
Inspections	75
Plan Reviews	189

*Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.*

<b>Figure 5. Budget information (PWSS Grant), Delaware, 2015</b>	
Total Budget	\$1,113,449
Federal Budget	\$644,148
State Budget	\$469,301
Number of Staff Authorized	16.4

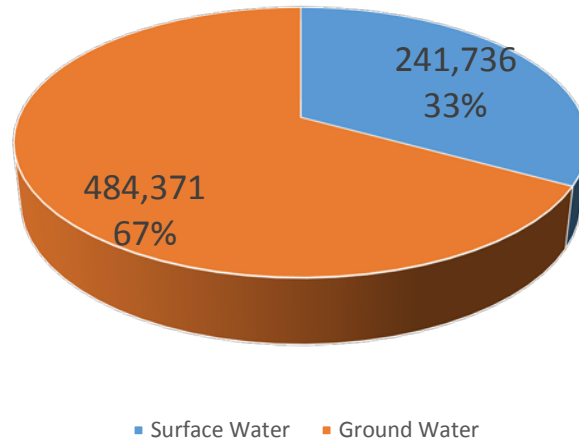
*Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.*

<b>Figure 6. Operator Certification, Delaware, 2015</b>	
	<b>Number</b>
Certified Operators	422
Approved Sampler/Testers	586

*Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.*

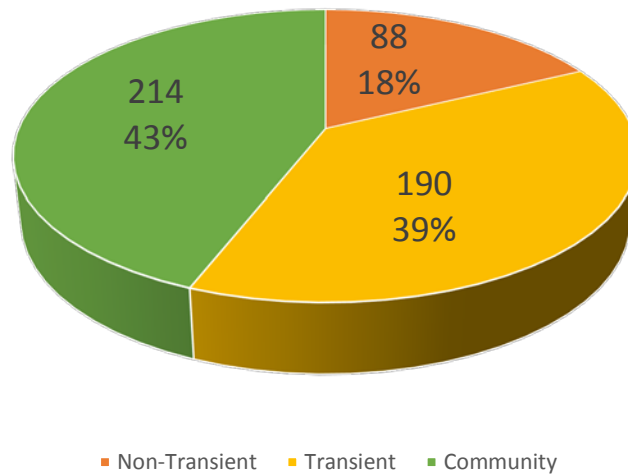


**Figure 7. Population Served by Surface Water and Groundwater Systems, Delaware, 2015**



Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.

**Figure 8. Types of Public Water Systems, Delaware, 2015**



Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.

**Figure 9. Summary of Violations, Delaware, 2015**

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Organic Contaminants</b>							
1,1,1-Trichloroethane	0.2	0	0	n/a	n/a	0	0
1,1,2-Trichloroethane	.005	0	0	n/a	n/a	0	0
1,1-Dichloroethylene	0.007	0	0	n/a	n/a	0	0
1,2,4-Trichlorobenzene	.07	0	0	n/a	n/a	0	0
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0	0	n/a	n/a	0	0
1,2-Dichloroethane	0.005	0	0	n/a	n/a	0	0
1,2-Dichloropropane	0.005	0	0	n/a	n/a	0	0
2,3,7,8-TCDD (Dioxin)	3x10 <sup>-8</sup>	0	0	n/a	n/a	0	0
2,4,5-TP	0.05	0	0	n/a	n/a	0	0
2,4-D	0.07	0	0	n/a	n/a	0	0
Acrylamide	n/a	n/a	n/a	0	0	n/a	n/a
Alachlor	0.002	0	0	n/a	n/a	0	0
Atrazine	0.003	0	0	n/a	n/a	0	0
Benzene	0.005	0	0	n/a	n/a	0	0
Benzo[a]pyrene	0.0002	0	0	n/a	n/a	0	0
Carbofuran	0.04	0	0	n/a	n/a	0	0
Carbon tetrachloride	0.005	0	0	n/a	n/a	0	0
Chlordane	0.002	0	0	n/a	n/a	0	0
cis-1,2-Dichloroethylene	0.07	0	0	n/a	n/a	0	0
Dalapon	0.2	0	0	n/a	n/a	0	0
Di(2-ethylhexyl) adipate	0.4	0	0	n/a	n/a	0	0
Di(2-ethylhexyl)phthalate	0.006	0	0	n/a	n/a	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>Values are in milligrams per liter (mg/l), unless otherwise specified.

**Figure 9. Summary of Violations, Delaware, 2015** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
Dichloromethane	0.005	0	0	n/a	n/a	0	0
Dinoseb	0.007	0	0	n/a	n/a	0	0
Diquat	0.02	0	0	n/a	n/a	0	0
Endothall	0.1	0	0	n/a	n/a	0	0
Endrin	0.002	0	0	n/a	n/a	0	0
Epichlorohydrin	n/a	n/a	n/a	0	0	n/a	n/a
Ethylbenzene	0.7	0	0	n/a	n/a	0	0
Ethylene dibromide	0.00005	0	0	n/a	n/a	0	0
Glyphosate	0.7	0	0	n/a	n/a	0	0
Heptachlor	0.0004	0	0	n/a	n/a	0	0
Heptachlor epoxide	0.0002	0	0	n/a	n/a	0	0
Hexachlorobenzene	0.001	0	0	n/a	n/a	0	0
Hexachlorocyclo pentadiene	0.05	0	0	n/a	n/a	0	0
Lindane	0.0002	0	0	n/a	n/a	0	0
Methoxychlor	0.04	0	0	n/a	n/a	0	0
Methyl <i>tert</i> Butyl Ether (MTBE)	0.01	0	0	n/a	n/a	0	0
Monochlorobenzene	0.1	0	0	n/a	n/a	0	0
<i>o</i> -Dichlorobenzene	0.6	0	0	n/a	n/a	0	0
Oxamyl (Vydate)	0.2	0	0	n/a	n/a	0	0
<i>para</i> - Dichlorobenzene	0.075	0	0	n/a	n/a	0	0
Pentachlorophenol	0.001	0	0	n/a	n/a	0	0
Picloram	0.5	0	0	n/a	n/a	0	0
Simazine	0.004	0	0	n/a	n/a	0	0
Styrene	0.1	0	0	n/a	n/a	0	0
Tetrachloroethylene	0.005	0	0	n/a	n/a	0	0
Toluene	1	0	0	n/a	n/a	0	0
Total polychlorinated biphenyls (PCBs)	0.0005	0	0	n/a	n/a	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>Values are in milligrams per liter (mg/l), unless otherwise specified.

**Figure 9. Summary of Violations, Delaware, 2015** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/ Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
Toxaphene	0.003	0	0	n/a	n/a	0	0
trans-1,2-Dichloroethylene	0.1	0	0	n/a	n/a	0	0
Trichloroethylene	0.005	0	0	n/a	n/a	0	0
Vinyl chloride	0.002	0	0	n/a	n/a	0	0
Xylenes (total)	10	0	0	n/a	n/a	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>
<b>Disinfection Byproducts</b>							
Total trihalomethanes	0.08	0	0	n/a	n/a	0	0
Haloacetic Acid 5	0.06	0	0	n/a	n/a	0	0
Maximum Residual Disinfection Level	4.0	0	0	n/a	n/a	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>
<b>Inorganic Contaminants</b>							
Antimony	0.006	0	0	n/a	n/a	0	0
Arsenic	0.05	0	0	n/a	n/a	0	0
Asbestos	7 million fibers/L, with fiber length >10 microns	0	0	n/a	n/a	0	0
Barium	2	0	0	n/a	n/a	0	0
Beryllium	0.004	0	0	n/a	n/a	0	0
Cadmium	0.005	0	0	n/a	n/a	0	0
Chromium	0.1	0	0	n/a	n/a	0	0
Cyanide (as free cyanide)	0.2	0	0	n/a	n/a	0	0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>Values are in milligrams per liter (mg/l), unless otherwise specified.

**Figure 9. Summary of Violations, Delaware, 2015** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
Fluoride	2.0	0	0	n/a	n/a	0	0
Mercury	0.002	0	0	n/a	n/a	0	0
Nitrate	10 (as Nitrogen)	14	10	n/a	n/a	0	0
Nitrite	1 (as Nitrogen)	0	0	n/a	n/a	0	0
Selenium	0.05	0	0	n/a	n/a	0	0
Thallium	0.002	0	0	n/a	n/a	0	0
Total nitrate and nitrite	10 (as Nitrogen)	0	0	n/a	n/a	0	0
<b>Subtotal</b>		<b>14</b>	<b>10</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>
<b>Radionuclide MCLs</b>							
Gross alpha	15 pCi/l	0	0	n/a	n/a	0	0
Radium-226 and radium-228	5 pCi/l	0	0	n/a	n/a	0	0
Gross beta	4 mrem/yr	0	0	n/a	n/a	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>
<b>Total Coliform Rule</b>							
Acute MCL violation	Presence with <i>E. coli</i>	4	4	n/a	n/a	0	0
Non-acute MCL violation	Presence	37	28	n/a	n/a	0	0
Major routine and follow up monitoring	n/a	0	0	n/a	n/a	0	0
Sanitary survey <sup>5</sup>	n/a	n/a	n/a	n/a	n/a	0	0
<b>Subtotal</b>		<b>41</b>	<b>32</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>Values are in milligrams per liter (mg/l), unless otherwise specified.

**Figure 9. Summary of Violations, Delaware, 2015** (continued)

	MCL (mg/L) <sup>1</sup>	MCLs		Treatment Techniques		Significant Monitoring/Reporting	
		Violations	Systems with Violations	Violations	Systems with Violations	Violations	Systems with Violations
<b>Surface Water Treatment Rule</b>							
Filtered systems	n/a	n/a	n/a	0	0	n/a	n/a
Monitoring, routine/repeat	n/a	n/a	n/a	n/a	n/a	0	0
Treatment techniques	n/a	n/a	n/a	0	0	n/a	n/a
Turbidity	n/a	n/a	n/a	n/a	n/a	0	0
Monitoring, routine/repeat	n/a	n/a	n/a	n/a	n/a	0	0
Failure to filter	n/a	n/a	n/a	0	0	n/a	n/a
<b>Subtotal</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Lead and Copper Rule</b>							
<b>Lead and Copper Rule</b>	Action Level (mg/L)	Exceedance	Systems with Exceedance	Violations	Systems with violations	Violations	Systems with Violations
Initial lead and copper tap M/R	n/a	0	0	n/a	n/a	18	18
Follow-up or routine lead and copper tap M/R	n/a	0	0	n/a	n/a	3	3
Treatment installation	n/a	0	0	0	0	n/a	n/a
Public education	n/a	n/a	n/a	0	0	n/a	n/a
<b>Subtotal</b>	<b>n/a</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>
<b>Public Notification</b>		<b>Violations</b>		<b>n/a</b>	<b>Systems with Violations</b>		
Consumer Confidence Reports Violations		51		n/a	51		
Public Notification		0		n/a	0		
Ground Water Rule		0		n/a	0		
<b>Subtotal</b>		<b>51</b>		<b>n/a</b>	<b>51</b>		

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>Values are in milligrams per liter (mg/l), unless otherwise specified.

## Definitions for Summary of 2015 Violations Table

**Filtered Systems:** Surface water systems that have installed filtration treatment [40 CFR 141, Subpart H].

**Inorganic Contaminants (IOC):** Non-carbon-based compounds such as metals, nitrates, and asbestos. These contaminants are naturally occurring in some water, but can get into water through farming, chemical manufacturing, and other human activities. EPA has established MCLs for 15 inorganic contaminants [40 CFR 141.62].

**Lead and Copper Rule:** This rule established national limits on lead and copper in drinking water [40 CFR 141.80-91]. Lead and copper corrosion pose various health risks when ingested at any level, and can enter drinking water from household pipes and plumbing fixtures. States report violations of the lead and copper rule in the following five categories:

1. *Initial lead and copper tap monitoring/reporting:* A violation in which a system did not meet initial lead and copper testing requirements, or failed to report the results of those tests to the state.
2. *Follow-up or routine lead and copper tap monitoring/reporting:* A violation in which a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.
3. *Treatment installation:* Violations for a failure to install an optimal corrosion control treatment system or source water treatment system that would reduce lead and copper levels in water at the tap.
4. *Lead service line replacement:* A violation for a system's failure to replace lead service lines on the schedule required by the regulation.
5. *Public education:* A violation in which a system did not provide required public education about reducing or avoiding lead intake from water.

**Maximum Contaminant Level (MCL):** The highest amount of a contaminant that EPA allows in drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. MCLs are defined in milligrams per liter (mg/L; 1 mg/L = 1 part per million) unless otherwise specified.

**Monitoring:** EPA specifies which water testing methods the water systems must use, and sets schedules for the frequency of testing. A water system that does not follow EPA's schedule or methodology is in violation [40 CFR 141].

States must report monitoring violations that are significant as determined by the EPA administrator, in consultation with the states. For purposes of this report, significant monitoring violations are major violations and they occur when no samples are taken or when no results are reported during a compliance period. A major monitoring violation for the surface water treatment rule occurs when at least 90 percent of the required samples are not taken or results are not reported during the compliance period.

## Definitions for Summary of 2015 Violations Table *(continued)*

**Organic Contaminants:** Carbon-based compounds, such as industrial solvents and pesticides. These contaminants generally get into water through runoff from crop land or discharge from factories. EPA has set legal limits on 54 organic contaminants that are to be reported [40 CFR 141.61].

**Public Notification:** When a system issues a public notice and notifies the Division of Public Health that the notice was delivered.

**Radionuclides:** Radioactive particles which can occur naturally in water or result from human activity. EPA has set legal limits on five types of radionuclides: radium-226, radium-228, gross alpha, beta particle/photon radioactivity, and uranium [40 CFR 141]. Violations for these contaminants are to be reported using the following four categories:

1. *Gross alpha:* A violation for alpha radiation above MCL of 15 picocuries/liter. Gross alpha includes radium-226 but excludes radon and uranium.
2. *Combined radium-226 and radium-228:* A violation for combined radiation from these two isotopes above MCL of 5 pCi/L.
3. *Gross beta:* A violation for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.
4. *Uranium:* A violation for uranium is above 30 micrograms/liter (ug/L; 1 ug/L = 1 part per billion)

**Reporting Interval:** The reporting interval for violations to be included in this Public Water System Annual Compliance Report is from January 1, 2015 through December 31, 2015.

**Surface Water Treatment Rule:** Establishes criteria under which water systems supplied by surface water sources, or ground water sources under the direct influence of surface water, must filter and disinfect their water [40 CFR 141, Subpart H]. Violations of the Surface Water Treatment Rule are to be reported for the following four categories:

1. *Monitoring, routine/repeat (for filtered systems):* A violation for a system's failure to carry out required tests, or to report the results of those tests.
2. *Treatment techniques (for filtered systems):* A violation for a system's failure to properly treat its water.
3. *Monitoring, routine/repeat (for unfiltered systems):* A violation for a system's failure to carry out required water tests, or to report the results of those tests.
4. *Failure to filter (for unfiltered systems):* A violation for a system's failure to properly treat its water. EPA will supply data for this violation code to the states.



## Definitions for Summary of 2015 Violations Table *(continued)*

**Total Coliform Rule (TCR):** Establishes regulations for microbiological contaminants in drinking water. These contaminants can cause short-term health problems. If no samples are collected during the one-month compliance period, a significant monitoring violation occurs. States are to report four categories of violations:

1. *Acute MCL violation:* A violation where the system found fecal coliform or *E. coli*, potentially harmful bacteria, in its water, thereby violating the rule.
2. *Non-acute MCL violation:* A violation where the system found total coliform in samples of its water at a frequency, or level, that violates the rule. For systems collecting fewer than 40 samples per month, more than one positive sample for total coliform is a violation. For systems collecting 40 or more samples per month, more than 5 percent of the samples positive for total coliform is a violation.
3. *Major routine and follow-up monitoring:* A violation where a system did not perform any monitoring.
4. *Sanitary Survey:* A major monitoring violation if a system fails to collect five routine monthly samples if a sanitary survey is not performed.

**Treatment Techniques:** A water disinfection process that EPA requires instead of setting a MCL for contaminants that laboratories cannot adequately measure. Failure to meet other operational and system requirements under the surface water treatment and the lead and copper rules have also been included in this category of violation for purposes of this report.

**Unfiltered Systems:** Water systems that do not need to filter their water before disinfecting it because the source is very clean [40 CFR, Subpart H]. There are no unfiltered systems in Delaware.

**Violation:** A failure to meet any state or federal drinking water regulation.

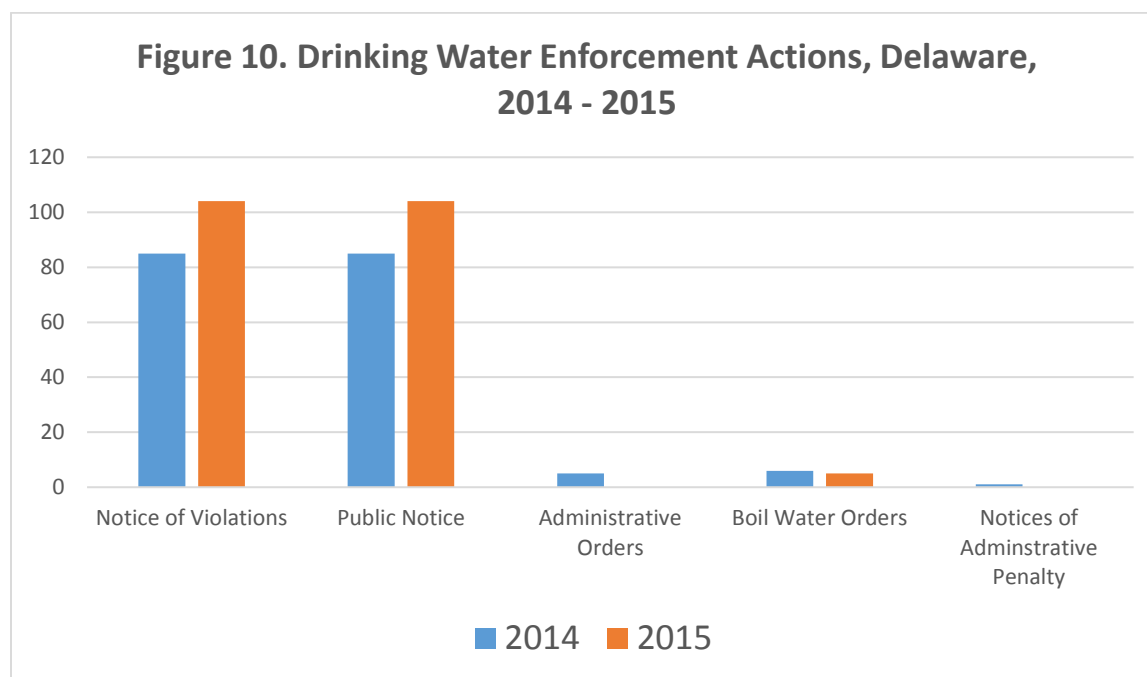
## 2015 Enforcement Actions

Enforcement actions are taken when a public water system violates an MCL or treatment technique, as specified in Delaware’s regulations governing public drinking water systems, or if a system fails to conduct proper monitoring and/or reporting (M/R) for a particular contaminant.

A notice of violation is the first action taken. This notifies the owner/operator of a public water system that there was a violation. The next action is the issuance of a public notice that the owner/operator is required to mail, hand-deliver, or post in a conspicuous place. This notifies the consumers of the water that there was a violation, what the violation was, possible related health effects, and preventive measures the consumer can take until the violation is corrected. A boil water notice is issued when a water system violates the bacteria standard and the presence of *E. coli* or fecal coliform is detected. This requires immediate notice (within 24 hours of being notified of the violation) to all consumers informing them about what actions to take to make their water safe for consumption; or if they should use an alternate source such as bottled water.

Additional enforcement actions, used when a water system repeatedly violates an MCL or when a history of violations is present, are the issuance of an administrative order and a bilateral compliance agreement. The administrative order can mandate the installation of treatment or the abandonment of a well with persistent violations. A bilateral compliance agreement is a written contract between the system and ODW in which the violations, corrective steps, and the timeframe for completing the work are established in writing and are enforceable.

Lastly, if a public water system fails to correct the violation or continues to ignore DPH requirements, a Notice of Administrative Penalty may be issued. The administrative penalty can range from \$100/day to \$10,000/day, per violation.



Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, 2015.

## Data Management

ODW uses an Oracle® based system to inventory water supplies, record sampling results, and track compliance with monitoring and MCL requirements. The system is called the Safe Drinking Water Information System (SDWIS) and includes information about water supply facilities, water sources, treatment used, and sampling results.

**Figure 11. Compliance Highlights, Public Water Systems, Delaware, 2015**

	Samples Collected	Systems In Compliance	% of State Served by Compliant Systems <sup>1</sup>	Systems not in Compliance	
				2015	2014
Bacteriological	10,219	465	99.1% (94.3%)	28	30
Bacteriological Acute ( <i>E. coli</i> )	10,219	489	99.6% (99.2%)	4	5
Surface Water Treatment Rule <sup>2</sup>	n/a	3	100% (100%)	0	0
Nitrates	1,894	485	99.3% (98.4%)	8	8
Fluoride	2,319	493	100% (100%)	0	0
Inorganic (IOC) Excluding Nitrate and Fluoride	1,683	493	100% (100%)	0	0
Volatile Organic Chemicals (VOC)	262	493	100% (100%)	0	0
Synthetic Organic Chemicals (SOC)	361	493	100% (100%)	0	0
Lead and Copper	1,415	493 <sup>2</sup>	100% (100%)	0	1
Lead and Copper/ M&R Violations	n/a	472	95.7% (99.7 %)	21	15
Consumer Confidence Rule – Failure to Report	n/a	442	89.7% (46.8%)	51	18
Consumer Confidence Rule – Inadequate Report	n/a	493	100% (100%)	0	9
Disinfection Byproducts (DBPs)	693	493	100% (100%)	0	1
Radiological	88	493	100% (100%)	0	0
Ground Water Rule	n/a	493	100% (100%)	0	1

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>First percentage based on population served, second percentage based on total number of public water systems.

<sup>2</sup> Systems with no action level exceedance.

## Systems out of Compliance

<b>Figure 12. Total Coliform Rule Violations, Delaware, 2015</b>		
<b>System Name</b>	<b>Population Served</b>	<b>Return to Compliance Date</b>
Bayshore Mobile Home Park	1,608*	9/17/2015
Blue Marlin Ice	25	12/8/2015
Brumbley's Family Park	48	5/18/2015
Children's Place	55	4/9/2015
Country Acres Mobile Home Park	28	9/11/2015
Countryside Hamlet	66	n/a
Delaware State Fire School	200	n/a
Dover Indoor Tennis	87	4/14/2016
Dover Skating Center	500	12/21/2015
Glasgow Deli	40	11/4/2015
Harrington Moose Lodge #534	25	11/4/2015
Hartly Trailer Park	90	11/6/2015
Hilltop Trailer Park	135	5/6/2015
Kelly's Tavern	50	1/19/2016
Kimothy's Place	50	5/13/15
Milton Cheer, Inc.	63	7/15/2015
Oak Grove Estates	150	7/16/2015
Rehoboth Bay Community	1,575	8/14/2015
Sambo's Tavern	212	10/2/2015
Shady Acres Mobile Home Park	150	8/4/2015
Shore Stop #227 Townsend	800*	9/18/2015
Shore Stop #231 Rising Sun	50	11/7/2015
Shore Stop #279 Greenwood	50	3/13/2015
Sports at the Beach System 3	25*	5/11/2016
Stargate Diner	50	2/8/2016
Tony J. Marchio Administrative Offices	50	4/22/2016
Treasure Beach Campground System 4	699*	8/7/2015
White Clay Creek State Park, System 2	25	n/a

Total Number of Violations: 37  
 Number of Systems Affected: 28  
 Number of Repeat Violators: 9  
 Total Population at Risk: 6,906

\*Total Number of Acute Violations: 4  
 Number of Systems Affected: 4  
 Number of Repeat Violators: 0  
 Total Population at Risk: 3,132

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 13. Nitrate Violations, Delaware, 2015**

System Name	Population Served	Return to Compliance Date
Bayshore Mobile Home Park	1,608	9/10/2015
Bethany Crest LLC	60	2/11/2016
Child Craft Company	60	7/2/2015
Forest Park	46	n/a
Hocker's Super Center	75	2/1/2016
Holly Lake Campsites System 3	900	n/a
Messick Supply	28	n/a
Shore Stop #256 Milford	150	n/a
South Fork Deli	100	n/a
Tall Pines Resort Community System 1	1,538	6/29/2015

Total Number of Violations: 15  
 Number of Systems Affected: 8  
 Number of Repeat Violators: 5  
 Total Population At Risk: 5,087

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 14. Radiological Compounds Violations, Delaware, 2015**

System Name	Population Served	Contaminant	MCL <sup>1</sup> in pCi/L <sup>2</sup>	Level Found in pCi/L
None	n/a	n/a	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population At Risk: 0

<sup>1</sup>MCL means Maximum Contaminant Level

<sup>2</sup>pCi/L means picocuries per liter

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 15. Inorganic/Volatile/Synthetic Organic Compound (IOC/VOC/SOC) Violations, Delaware, 2015**

System Name	Population Served	Contaminant	MCL <sup>1</sup> in mg/l <sup>2</sup>	Level Found in mg/l
None	n/a	n/a	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators (Systems): 0  
 Total Population At Risk: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>MCL means Maximum Contaminant Level

<sup>2</sup>mg/l means milligrams per liter

<b>Figure 16. Disinfection Byproducts (DPB) Violations, Delaware, 2015</b>				
<b>System Name</b>	<b>Population Served</b>	<b>Contaminant</b>	<b>MCL<sup>1</sup> in mg/l<sup>2</sup></b>	<b>Level Found in mg/l</b>
None	n/a	n/a	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population At Risk: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>MCL means Maximum Contaminant Level

<sup>2</sup>mg/l means milligrams per liter

<b>Figure 17. Maximum Residual Disinfection Level (MRDL) Violations, Delaware, 2015</b>				
<b>System Name</b>	<b>Population Served</b>	<b>Contaminant</b>	<b>MRDL<sup>1</sup> in mg/l<sup>2</sup></b>	<b>Level Found in mg/l</b>
None	n/a	n/a	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population At Risk: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<sup>1</sup>MRDL means Maximum Residual Disinfectant Level

<sup>2</sup>mg/l means milligrams per liter

<b>Figure 17. Ground Water Rule Treatment Techniques Violations, Delaware, 2015</b>		
<b>System Name</b>	<b>Population</b>	<b>Return to Compliance Date</b>
None	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population Affected: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015

<b>Figure 18. Surface Water Treatment Rule (Turbidity Violation), Delaware, 2015</b>	
<b>System Name</b>	<b>Population Served</b>
None	n/a

Total Number of Violations: 0  
 Number of System Affected: 0  
 Number of Repeat Violators: 0  
 Total Population Affected: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 19. Lead and Copper Monitoring Violations, Delaware, 2015**  
**Systems that failed to collect the required number of samples including tap samples and/or water quality parameters during any monitoring period in 2015**

System Name	Population	Return to Compliance Date
Children's Place	55	n/a
Country Club Village	72	n/a
Crossroad Christian Church Academy	68	n/a
Forest Park	46	n/a
Governor Bacon Health Center	525	n/a
Grayling ILC, Seaford	120	n/a
Hand-N-Hand Early Learning Center	41	n/a
Hilltop Trailer Park	135	n/a
Hocker's Super Center	75	n/a
Lake Forest Estates	225	4/1/2015
Little Einsteins Preschool	33	n/a
Messick's MHC, LLC System 2	36	n/a
Messick's MHC, LLC System 3	45	n/a
Messick's MHC, LLC System 4	72	n/a
Messick's MHC, LLC System 5	102	n/a
Messick's MHC, LLC System 6	63	n/a
Nanticoke Business Park	50	n/a
Northside Professional Center	30	n/a
Rainbow Day Care	54	n/a
Sussex Manor Mobile Home Park	49	n/a
Willis Auto Mall	65	n/a

Total Number of Violations: 21  
 Number of Systems Affected: 21  
 Number of Repeat Violators: 0  
 Total Population At Risk: 1,961

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 20. Lead/Copper Rule (LCR) Action Level Exceedances, Delaware, 2015**

System Name	Population Served	Contaminant	AL <sup>1</sup> in mg/l <sup>2</sup>	90 <sup>th</sup> percentile in mg/l
None	n/a	n/a	n/a	n/a

Total Number of Exceedances: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population At Risk: 6,000

<sup>1</sup>AL means Action Level

<sup>2</sup>mg/l means milligrams per liter

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

<b>Figure 21. Failure to have Licensed Operator Violations, Delaware, 2015</b>	
<b>System Name</b>	<b>Population served</b>
Barkers Landing	498
Beach Babies Day Care	180
Center for the Creative Arts	115
The Children's Center	30
Child's Play by the Bay	60
Cozy Critters Day Care	120
Crossroad Christian Church Academy	68
Eagles Nest Fellowship Church	400
Enchanted Acres MHP, LLC	75
Favored Childcare Academy	30
First Step Preschool	50
Glen Acres	72
Grayling ILC, Seaford	120
Greenwood Mennonite Church	260
Hand-N-Hand Early Learning Center	41
Hartly Elementary School	450
Hilltop Trailer Park	135
Holiday Estates	75
Holiday Pines	60
Kristin's Care and Learning Center	44
Lake Forest Estates	225
Lotus Blossom Learning Center	30
Nanticoke Business Park	50
North Dover Plaza System 2	35
O. A. Newton and Sons, Inc.	75
Rainbow Day Care	54
Serenity Manor Estates	110
Shell's Learning Center III	83
Shoppes at Millville	25
Slaughter Beach Water II	31
Slaughter Neck Community Action Agency	150

Total Number of Violations: 31

Number of Systems Affected: 31

Number of Repeat Violators: 0

Total Population Affected: 3,751

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.



**Figure 22. Monitoring Violations<sup>1</sup>  
Systems that failed to collect the required number of samples during any monitoring period, Delaware, 2015**

System Name	Population	Rule
First State Equipment	164	Total Coliform
Kimothy's Place	50	Total Coliform
Newark Water Department	36,450	Disinfection Byproducts
Suez, formerly United Water Delaware	97,310	LT2 SWTR
Wilmington Water Department	107,976	LT2 SWTR

Total Number of Violations: 5  
 Number of Systems Affected: 5  
 Number of Repeat Violators: 0  
 Total Population Affected: 241,950

<sup>1</sup> Other than Lead and Copper

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 23. Consumer Confidence Report (CCR) Violations  
Inadequate Reporting, Delaware, 2015**

System Name	Population served	Return to Compliance Date
None	n/a	n/a

Total Number of Violations: 0  
 Number of Systems Affected: 0  
 Number of Repeat Violators: 0  
 Total Population Affected: 0

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

**Figure 24. Consumer Confidence Report (CCR) Violations  
Failure to Report, Delaware, 2015**

System Name	Population served	Return to Compliance Date
Angola Beach Estates	1,275	7/24/2015
Artesian Water Company	211,494	7/2/2015
Augustine Creek	601	7/2/2015
Bayview Improvement Company	141	7/2/2015
Beaver Creek	750	7/2/2015
Bethany Crest LLC	60	n/a
Blades, Town of	1,200	7/6/2015
Burtonwood	1,509	7/2/2015
Cedar Landing	420	7/2/2016
Church Creek	5,661	7/2/2016
Commodore Estates	162	7/2/2015
Country Acres Mobile Home Park	28	n/a
Countryside Hamlet	66	n/a
Country View	84	n/a
County Seat Gardens	297	7/6/2015
Deer Meadows	480	7/2/2015
Delaware Correctional Center	2,000	7/2/2015

<b>Figure 24. Consumer Confidence Report (CCR) Violations Failure to Report, Delaware, 2015 (continued)</b>		
Enchanted Acres MHC, LLC	225	10/7/2015
Forest Park	46	n/a
Fox Hunter Crossing	3,450	7/2/2015
Frankford Water Department	1,014	7/21/2015
Glen Acres	72	n/a
Hartly Trailer Park	90	7/9/2015
Heron Bay	2,451	7/2/2015
Hilltop Trailer Park	135	n/a
Holiday Estates	75	n/a
Lake Forest Estates	225	7/6/2015
Law Mobile Home Park	50	7/23/2015
Lewes Board of Public Works	9,400	7/15/2015
Maranatha Court	54	n/a
Messick's MHC, LLC System 2	36	n/a
Messick's MHC, LLC System 3	45	n/a
Messick's MHC, LLC System 4	72	n/a
Messick's MHC, LLC System 5	102	n/a
Messick's MHC, LLC System 6	63	n/a
New Castle Water Department	6,000	7/6/2015
Ocean View Water Department	2,688	7/27/2015
Paradise Estates	153	7/2/2015
Pepper Ridge Park	209	7/7/2015
Pinnacle Rehabilitation & Health Center	256	7/22/2015
Rehoboth Bay Community	1,575	9/23/2015
Serenity Manor Estates	110	8/6/2015
South Bethany	16,119	7/2/2015
Sussex Manor Mobile Home Park	49	n/a
Thomas Cove	6,297	7/2/2015
Weatherstone Crossing	429	7/2/2015
White Oak Mobile Home Park	78	n/a
Wicksfield	981	7/2/2015
Wilmington Water Department	107,976	7/6/2015
Windsong Farms	1,014	7/2/2015
Woodland Trailer Court	41	8/3/2015

Total Number of Violations: 51

Number of Systems Affected: 51

Number of Repeat Violators: 0

Total Population Affected: 387,808

Source: Delaware Department of Health and Social Services, Division of Public Health, Office of Drinking Water, Dec. 31, 2015.

## Conclusion

The ODW, the EPA, other state agencies, and non-governmental organizations are working with Delaware's public drinking water systems to ensure compliance with all applicable state and federal drinking water regulations, that violations are corrected in a timely manner, and to provide technical assistance as needed. This cooperative action ensures that all Delaware residents and visitors receive safe and potable sources of drinking water.

During calendar year 2015, 11,993 (1.6 percent) of Delaware's 728,879 residents receiving water from community water supplies were exposed to harmful contaminants, such as nitrates and total coliforms (including *E. coli* bacteria). Of 493 public water systems, 36 (7.3 percent) had a violation and 14 systems (2.8 percent) had repeat violations for health-based contaminants. Twenty-six water systems (5.3 percent) reported monitoring and reporting (M/R) violations: 21 systems reported violations of the Lead and Copper Rule, two systems had violations of the Total Coliform Rule, one system reported a violation of the Disinfection Byproducts Rule, and two had monitoring violations for the Long Term 2 Enhanced Surface Water Treatment Rule.

Additionally, 51 water systems received a violation for failure to submit their Consumer Confidence Reports (CCR) and delivery certification to ODW by July 1, 2015. Twenty-four water systems returned to compliance within one week, seven were in compliance by the end of July, and an additional five systems were back in compliance by the end of the year. The remaining 15 water systems had not returned to compliance by the end of 2015. The reason for the increase in CCR reporting violations is that the ODW made a strict interpretation of the reporting deadline and held systems accountable for meeting that deadline.

The ODW identified 31 public water systems for failing to have a licensed water operator. Nine are small community water systems and the other 22 are non-transient non-community public water systems. The ODW will work with these systems to help them find water operators. Delaware experienced a 46.2 percent decrease in the number of licensed operators in the last year. ODW has not been able to determine the reason for this significant decrease.

ODW over the last year has adopted five new rules including the Revised Total Coliform Rule. The Revised Total Coliform Rule will significantly change how we address detections of total coliform bacteria in our water systems. This will require us to continue to work with our water systems and technical assistance providers to ensure the provision of safe drinking water for all Delawareans.

For detailed information about Delaware's public water systems, visit EPA's Envirofacts webpage at [www.epa.gov/enviro/html/sdwis/sdwis\\_query.html](http://www.epa.gov/enviro/html/sdwis/sdwis_query.html). Additional information can be found on the ODW web page: [www.dhss.delaware.gov/dhss/dph/hsp/odw.html](http://www.dhss.delaware.gov/dhss/dph/hsp/odw.html). To view water system test results visit Drinking Water Watch at <https://drinkingwater.dhss.delaware.gov/>. More information is available at this water quality website maintained by the Governor's Office: <http://www.delaware.gov/topics/waterquality/index.shtml>.