



Report to EPA

**SAFE DRINKING WATER ACT
ANNUAL COMPLIANCE REPORT
FOR CALENDAR YEAR 2016**

June 2017



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EXECUTIVE SUMMARY

The Safe Drinking Water Act reauthorization of 1996 requires states to submit annual reports of the drinking water violations that occurred within their State to the United States Environmental Protection Agency (EPA). This report constitutes Maryland's annual compliance report for calendar year 2016. This report provides information on drinking water quality standards, summarizes public water system violations that occurred during 2016 or were ongoing from prior years, and describes some initiatives that were undertaken in 2016. The report covers the period from January 1, 2016 through December 31, 2016.

The Maryland Department of the Environment (MDE) is charged with ensuring that the water quality and quantity at all public water systems meet the needs of the public and is in compliance with federal and State regulations. This report describes the activities that are undertaken on a routine basis by MDE to ensure that public drinking water systems provide safe water to their consumers. Routine activities include regular on-site inspections of water systems to identify any sanitary defects in the systems, technical assistance, and a permitting process that helps ensure that systems obtain the best possible source of water. In addition, MDE works with private contractors and local health departments to identify potential sources of contamination in close proximity to ground water and surface water supplies so that the systems can protect their water sources before contamination occurs. Maryland regulates 3,295 public water systems (464 community water systems, 532 non-transient non-community water systems, and 2,299 transient non-community water systems).

Public water systems are required to sample for a variety of contaminants on a routine basis depending on the population served, source type, and historical monitoring data of the water system. When contaminants are found at levels exceeding the federally established Maximum Contaminant Level (MCL), it is considered a violation of federal and State standards. MCL violations are rare in Maryland for most types of chemical contaminants. In 2016, no systems exceeded the MCL for an organic (volatile or synthetic) contaminant at the water treatment plant. Four systems exceeded the MCL for nitrate in 2016 or had on-going nitrate MCL violations beginning prior to 2016; two systems exceeded the MCL for arsenic in 2016 or had on-going arsenic MCL violations beginning prior to 2016; and one system exceeded the MCL for combined radium in 2016. Three systems exceeded the MCL for haloacetic acids or had on-going violations prior to 2016, and four systems exceeded the MCL for trihalomethanes or had on-going violations prior to 2016. No systems had an acute MCL violation under the Total Coliform Rule and 19 systems (all non-community water systems) had a non-acute MCL violation under the Total Coliform Rule. Under the Revised Total Coliform Rule, which became effective in April 2016, 10 systems (one small community water system and nine non-community water systems) had an acute MCL violation.

Violations are also incurred for failure to monitor and/or report as required, failure to use required treatment techniques, or failure to notify the public under certain circumstances. During 2016, no systems had a monitoring/reporting violations for inorganic contaminants, no systems had a monitoring/reporting violation for organic (volatile or synthetic) contaminants, 104 systems had new or on-going monitoring/reporting violations for lead and copper, seven systems had monitoring/reporting violations for coliform bacteria under the Total Coliform Rule, and 239 systems had monitoring/reporting violations under the Revised Total Coliform Rule. Five systems had treatment technique violations under the Revised Total Coliform Rule.

THE DRINKING WATER PROGRAM: AN OVERVIEW

The United States Environmental Protection Agency (EPA) established the Public Water System Supervision (PWSS) Program under the authority of the 1974 Safe Drinking Water Act (SDWA). Under the SDWA and its 1986 and 1996 Amendments, EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfection Levels (MRDLs). For some regulations, EPA establishes Treatment Techniques (TTs) in lieu of an MCL to control unacceptable levels of contaminants in water. The Agency also regulates how often public water systems (PWSs) monitor their water for contaminants and report the monitoring results to the States or EPA. Generally, the larger the population served by a water system, the more frequent the monitoring and reporting (M/R) requirements. In addition, EPA requires PWSs that serve more than 10,000 persons to monitor for unregulated contaminants in order to provide data for future regulatory development. Finally, EPA requires PWSs to notify the public when they have violated these regulations. Public notification must include a clear and understandable explanation of the nature of the violation, its potential adverse health effects, steps that the PWS is undertaking to correct the violation, and the possibility of alternative water supplies during the violation.

The SDWA applies to the 50 states, the District of Columbia, Indian Lands, Puerto Rico, the Virgin Islands, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the Republic of Palau.

The SDWA allows states and territories to seek EPA approval to administer their own PWSS Programs. The authority to run a PWSS Program is called primacy. For a state to receive primacy, EPA must determine that the state meets certain requirements laid out in the SDWA and the regulations, including the adoption of drinking water regulations that are at least as stringent as the federal regulations and a demonstration that they can enforce the program requirements. All 50 states have primacy with the exception of Wyoming. The EPA Regional Offices report the information for Wyoming, as well as the District of Columbia, and all Indian Lands but the Navaho Nation. EPA Regional Offices also report federal enforcement actions taken. Maryland received primacy for the PWSS program in 1977.

Each quarter, primacy states submit data to the federal Safe Drinking Water Information System (SDWIS/Fed), an automated database maintained by EPA. The data submitted include, but are not limited to, PWS inventory information, sample results for specific contaminants (i.e. lead and copper), the incidence of MCL exceedances, monitoring, and TT violations, and information on enforcement activities related to these violations. In March 2016, Maryland completed the migration of the program's legacy database to SDWIS-State. In October 2016, the EPA approved the reporting of Maryland's violations and enforcement actions from their new SDWIS/State database. Section 1414(c)(3) of the SDWA requires states to provide EPA with an annual report of violations of the primary drinking water standards. This report provides an overview of violations in each of six categories: MCLs, TTs, variances, exemptions, significant monitoring violations, and significant consumer notification violations. Maryland's SDWIS/State database is the source of data for this report.

MARYLAND'S WATER SUPPLY PROGRAM

The Water Supply Program (WSP) is a part of the Water Management Administration in the Maryland Department of the Environment (MDE). The mission of the WSP is to ensure that public drinking water systems provide safe and adequate water to all current and future users in Maryland, and that appropriate usage, planning, and conservation policies are implemented for Maryland's water resources. This mission is accomplished through proper planning for water withdrawal, protection of water sources that are used for public water supplies, oversight and enforcement of routine water quality monitoring at public water systems, regular on-site inspections of water systems, review of design plans to install or upgrade water treatment, and prompt response to water supply emergencies. In addition to ensuring that public drinking water systems meet federal and State requirements under the PWSS program, the WSP also administers the wellhead protection program, manages water resources, oversees the Board of Water and Wastewater Operators Certification, the Board of Well Drillers, the Laboratory Certification Program, and issues water appropriation permits for both public and private water users, and commercial and agricultural entities statewide. Because all of these activities reside together in the WSP, Maryland has the unique opportunity to evaluate and regulate public drinking water systems from a broad perspective that includes an evaluation of the resource for both quantity and quality. The WSP's activities help to ensure safe drinking water for over five million Marylanders.

Public drinking water systems fall into three categories: community, non-transient non-community, and transient non-community. Community water systems (CWSs) serve year-round residents, non-transient non-community water systems (NTNCWSs) serve non-residents (e.g. school, business, etc.), and transient non-community water systems (TNCWS) serve different consumers each day (e.g. campground, restaurant, etc.). During 2016, the number of public water systems in Maryland remained consistent compared with previous years: 464 CWSs, 532 NTNCWSs, and 2,299 TNCWSs.

MDE directly regulates community water systems (county and municipal systems, large and small communities, and mobile home parks) and non-transient non-community water systems (businesses, schools, and day care centers that have their own water supply system). Transient non-community water systems (e.g. gas stations, campgrounds, and restaurants that have their own water supply system) are regulated and enforced by the local county environmental health departments through State-County delegation agreements, with the exception of systems in Cecil, Montgomery, Prince George's, Wicomico, Charles, and Anne Arundel counties, which are directly regulated and enforced by the WSP. Table 1 presents a summary of Maryland's 2016 statistics on public water systems and the populations served by each type of system.

In the Water Supply Program, emphasis is placed on preventative measures instead of reactive enforcement actions in order to avert serious public health incidents. The vast majority of drinking water violations are corrected immediately, or following the initial notices of violation. Preventative measures include source water (ground and surface) protection, monitoring schedules, technical assistance, operator training, and sanitary survey inspections. Source water protection programs, such as wellhead protection and surface water protection, are used to identify sources of potential contamination and activities that can prevent future contamination incidents.

Table 1. Maryland Drinking Water Statistics	
Population of Maryland (July 1, 2016 Census estimate)	6,016,447
Number of individuals served by community water systems	5,107,864
Percent of population served by public water systems	85
Percent of population served by individual wells	15
Number of Public Water Systems	3,295
Number of Community Systems	464
Number of Non-transient Non-community Systems	532
Number of Transient Non-community Systems	2,299
Number of Systems using surface water	65
Number of Systems using only ground water	3,230

Program Activities

Routine oversight of public drinking water systems involves a wide range of activities. These activities focus on helping systems to obtain and protect the best available source of water, ensuring that systems comply with State and federal water quality monitoring requirements, and making certain that systems maintain sufficient treatment processes to address any water quality concerns. Table 2 presents a summary of the major activities conducted by the Program in 2016.

Table 2. Water Supply Program's Major Activities for 2016	
Sanitary Surveys (Class 1) Conducted on CWS and NTNCWS	462
Sanitary Surveys Conducted on TNC Systems*	422*
Technical Reviews of Water Construction Projects	54
Water Appropriation Permits Issued (New and Renewal)	516
Individuals Certified to Sample Drinking Water	1089
New Wells Sited	25
Ground Water Under the Direct Influence of Surface Water Determinations	16
Water Quality Reports Reviewed	44,000
County Water and Sewer Plans Reviewed	39
Laboratory certifications completed	102

** NOTE: Local health department totals for TNC systems do not include the 2016 fourth quarter numbers.*

Appropriation Permits Maryland implements a comprehensive water appropriations permitting program, ensuring that the State is able to effectively manage its water resources to ensure their sustainable use and to minimize the potential for conflicts between users. Permits specify the water source (e.g. the name of the aquifer for groundwater withdrawals), location of withdrawal, the quantity of allowable use, purpose of use, measuring and reporting of use, and other conditions in accordance with the appropriate laws and regulations. Permits are valid for a period of up to twelve years. Details on who should obtain a permit can be found on MDE's website (http://www.mde.maryland.gov/programs/Water/Water_Supply/Documents/www.mde.state.md.us/assets/document/permit/2008PermitGuide/WMA/3.15.pdf). Evaluation of permit requests requires an assessment of the reasonableness of the quantity for the intended use, the reasonableness of the impact on the resource, and the potential impact of the withdrawal on neighboring users. Permitted quantities are not allowed to exceed the sustainability of the resource. The appropriation permitting process is a key component in ensuring an adequate and reliable capacity of Maryland's community water systems.

Compliance Activities Approximately 1,000 community and non-transient non-community water systems in Maryland must test for over 90 regulated contaminants on schedules which vary based on source type, historical data, and population. Data is received throughout the year and reviewed for compliance with the regulations. WSP staff received and reviewed approximately 44,000 water quality reports for samples collected in 2016. The WSP issues Notices of Violations (NOVs) for Maximum Contaminant Level (MCL) and Treatment Technique (TT) violations as they occur. NOVs for monitoring violations are issued monthly. The WSP maintains an inventory of approximately 3,300 public water systems.

Consumer Confidence Reports The Consumer Confidence Report Rule requires all community systems to report water quality data in an understandable format to their consumers. The reports must be submitted annually to the WSP by July 1st for the previous calendar year's data, and certification of their delivery to each resident within the system must be submitted to the WSP by October 1st of each year. MDE places the reports for the water systems on the MDE website every year.

Enforcement Strategy The strategy that has been adopted for managing enforcement is progressive enforcement. This technique has been effective in resolving violations and reserving time consuming formal civil and criminal actions for the most serious cases.

In 2016, MDE continued to implement the federal Drinking Water Enforcement Response Policy. The new strategy prioritizes water systems needing enforcement action. It also establishes a new priority for noncompliance that has the potential to affect children, such as violations at schools and daycare centers. The goal is to be consistent with EPA's new enforcement tracking tool which ranks water systems with violations based on violation type (e.g. MCL) and length of time the violation has occurred. Systems are considered to be "on the Path to Compliance" if they have received a formal notice of violation, entered into a compliance agreement, or returned to compliance. As of May 2017, 22 out of 24 public water systems identified in the targeted list for enforcement under the Enforcement Response Policy (ERP) have returned to compliance or have been addressed by formal enforcement actions.

Sanitary Survey Inspections A sanitary survey is a comprehensive on-site inspection of a water system, including the source, treatment, storage, and distribution systems, as well as a review of the operations and maintenance of the system. These inspections are conducted for the purpose of determining the adequacy and reliability of the water system to provide safe drinking water to

its customers. The sanitary survey can be used to follow up known or suspected problems or on a routine basis to assess the water system's viability and prevent future problems from occurring. The WSP's current goals for inspection frequencies are: once a year for surface water systems; once every two years for community water systems; and once every three years for non-transient non-community water systems and non-delegated transient non-community water systems, when staffing levels are sufficient. Inspectors may require system upgrades if sanitary deficiencies are identified. A total of 462 sanitary surveys were completed for community and non-transient non-community water systems in 2016. In addition, WSP and County staff conducted sanitary survey inspections for over 422 transient non-community water systems during 2016.

School Notifications Schools that have their own water systems tend to have more total coliform bacteria detections at the beginning of the school year. This is mostly because of the school closing during the summer which results in the water being stagnant in the building plumbing for a long period of time, allowing bacteria to grow. As part of the Department's annual compliance assistance to schools, on August 4, 2016, the WSP sent information to the County Boards of Education and private schools recommending that they flush the plumbing in their buildings prior to school starting.

Source Water Protection Source Water Assessments were completed in 2004 for all public water systems that were active in Maryland. To date, 321 (68%) active, community water systems are implementing protection measures for their supplies. These systems serve approximately 3.59 million (68%) residents of Maryland. The WSP continues to provide technical support for the Maryland Rural Water Association (MRWA) to work on source protection issues. In addition, the WSP is an active participant in several source protection partnerships, such as the Potomac River Partnership and the Baltimore Reservoir Technical Group.

Transient Non-community Water System Oversight Transient water systems, such as churches, campgrounds, rest stops, and rural establishments, account for approximately 70 percent of the total number of Maryland's public water systems. In 2016, 17 of Maryland's 23 counties had delegated authority for oversight of transient non-community systems in their jurisdictions, and received funding (approximately \$301,000) from MDE through the Drinking Water State Revolving Fund set-asides. Effective FY2016, the WSP had direct oversight of 714 transient non-community water systems in the six Counties without the delegation.

Counties with delegated authority have overseen the transient system program since 1998. The WSP provides delegated counties with funding, written and verbal guidance regarding implementing drinking water regulations, and provides training opportunities to educate the county programs staff about the federal and State requirements for these systems. In calendar year 2016, the WSP performed two program evaluations of the delegated counties in order to identify training needs for the County programs on implementing the delegation agreements. The program evaluations involve visiting each county for a file review, interviewing county staff regarding program operations, and preparing a written evaluation of each County's delegated program. Guidance and technical assistance are provided to the counties as needed. In 2016, the WSP provided training for the County Health Departments and State-certified laboratories on the Revised Total Coliform Rule and revised the guidance manual for the transient water systems to include the new requirements under the Revised Total Coliform Rule.

Well Siting One important step in protecting a ground water supply is to identify the best possible location for drilling the well. WSP staff conducts joint field investigations with local health department personnel for approval of community and non-transient non-community well sites that are not susceptible to contaminant sources. In 2016, 25 well sites for public water systems were approved by the WSP.

COMPLIANCE INFORMATION

This report covers violation and enforcement data for calendar year 2016. Maximum Contaminant Level (MCL), Treatment Technique (TT), and Monitoring/Reporting (M/R) violations are reported for all community and non-transient non-community water systems.

Summaries of the various violations for all public water systems in 2016 are presented in Tables 3 through 10.

Both MCL and M/R violations occur more frequently in smaller systems, which have fewer resources and less technical expertise for operating the systems. WSP field engineers regularly visit systems where water quality problems occur to advise and assist system owners to meet their regulatory and water quality requirements.

Maximum Contaminant Level (MCL) Compliance

Under the Safe Drinking Water Act (SDWA), the EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs). Contaminants are categorized into four main categories: 1) Inorganic Contaminants, 2) Organic Contaminants, 3) Microbiological Contaminants, and 4) Disinfectants and Disinfection Byproducts. Tables 3 through 8 present summaries of public water system violations that occurred during 2016, or violations that occurred prior to 2016 and were not resolved.

Inorganic contaminant (IOC) violations. In 2016, four water systems exceeded the MCL or had on-going MCL violations for nitrate, two systems exceeded the MCL for arsenic or had on-going MCL violations for arsenic, and one system exceeded the MCL for combined radium. Table 3 summarizes this data.

Volatile organic contaminant (VOC) violations and synthetic organic contaminant (SOC) violations. No systems exceeded the MCL for any organic contaminant in 2016. Tables 4 and 5 summarize the monitoring and reporting violations for these contaminants.

Microbial Contaminants. Generally, the majority of the MCL violations occur in very small transient non-community water systems. Of the 996 community and non-transient non-community water systems and 2,299 transient non-community water systems in Maryland, no systems had acute MCL violations under the Total Coliform Rule, however, 10 systems (one small community water system and nine transient non-community water systems) had acute MCL violations under the Revised Total Coliform Rule, and 19 non-community water systems had non-acute MCL violations under the Total Coliform Rule. Tables 6 and 6A summarize this data.

Monitoring Compliance

If a PWS fails to have its water tested as required or fails to report test results correctly or on time to the primacy state, a monitoring violation occurs.

Water systems are notified annually by MDE of their monitoring requirements. In addition, a reminder notice is sent to the systems approximately one month before the end of the monitoring period if reports are not received. If a system fails to report or complete the required testing, a violation letter is sent to the water system. If there is no response after about one month, a second notice of violation letter is sent by certified mail to the water system; this letter will typically contain a requirement for public notification and potential fines. Telephone calls and visits by the technical staff are also used to provide assistance to water systems.

Monitoring/Reporting Violations For this report, monitoring violations are generally defined as any monitoring violation that occurred during the calendar year of the report or occurred prior to the calendar year of the report and were not resolved. A monitoring/reporting violation, with rare exceptions, occurs when no samples were taken or no results were reported during a compliance period. The tables in this report include monitoring/reporting violations for community water systems and non-transient non-community water systems. During 2016 or prior to 2016 and on-going, no systems had monitoring/reporting violations for IOCs or for organic contaminants (VOCs and SOCs). Seven systems had monitoring/reporting violations for total coliform under the Total Coliform Rule, 239 systems had monitoring/reporting violations for total coliform under the Revised Total Coliform Rule, and no systems had monitoring/reporting violations under the D/DBPR (see Tables 3 through 8). Four systems had monitoring/reporting violations for initial tap sampling for lead and copper, and 100 systems had monitoring/reporting violations for follow-up or routine (reduced) sampling for lead and copper (see Table 9).

Table 3. Inorganic Contaminant Violations (2016)

(CWS, NTNCWS, & TNCWS)

Contaminant			MCL Violations			Monitoring Violations		
Code	Name	MCL (mg/L)	# of Vios	# Vios RTC	# of Systems with Vios	# of Vios	# Vios RTC	# of Systems with Vios
1074	Antimony*	0.006	0	0	0	0	0	0
1005	Arsenic	0.010	3	3	2	21	16	20
1094	Asbestos	7 mil. fibers/L	0	0	0	0	0	0
1010	Barium*	2	0	0	0	0	0	0
1075	Beryllium*	0.004	0	0	0	0	0	0
1015	Cadmium*	0.005	0	0	0	0	0	0
1020	Chromium*	0.1	0	0	0	0	0	0
1024	Cyanide	0.2	0	0	0	0	0	0
1025	Fluoride	4	0	0	0	0	0	0
1035	Mercury*	0.002	0	0	0	0	0	0
1036	Nickel*	N/A	0	0	0	0	0	0
1040	Nitrate-N	10	5	3	4	50	33	47
1041	Nitrite-N	1	0	0	0	0	0	0
1045	Selenium*	0.05	0	0	0	0	0	0
1085	Thallium*	0.002	0	0	0	0	0	0
4000	Gross Alpha Radioactivity	15 pCi/L	0	0	0	0	0	0
4100	Gross Beta Radioactivity	4 mrem	0	0	0	0	0	0
4010	Combined Radium 226 +228	5 pCi/L	1	0	1	0	0	0
	Totals		9	6	6**	71	49	61***

MCL = maximum contaminant level

RTC = returned to compliance

* The nine Phase II/V metals are typically sampled and reported as a group; the “Totals” row in Table 3 does not always reflect the individual contaminants

** Six systems had one or more MCL violations for IOC contaminants

*** 61 systems had one or more monitoring violations for IOC contaminants

Table 4. Violations for Volatile Organic Contaminants (2016)

Contaminant			MCL Violations			Monitoring Violations		
Code	Name	MCL (mg/L)	# of Vios	# Vios RTC	# of Systems with Vios	# of Vios	# Vios RTC	# of Systems with Vios
2977	1,1-Dichloroethylene	0.007	0	0	0	0	0	0
2981	1,1,1-Trichloroethane	0.2	0	0	0	0	0	0
2985	1,1,2-Trichloroethane	0.005	0	0	0	0	0	0
2980	1,2-Dichloroethane	0.005	0	0	0	0	0	0
2983	1,2-Dichloropropane	0.005	0	0	0	0	0	0
2378	1,2,4-Trichlorobenzene	0.07	0	0	0	0	0	0
2990	Benzene	0.005	0	0	0	0	0	0
2982	Carbon Tetrachloride	0.005	0	0	0	0	0	0
2380	cis-1,2-Dichloroethylene	0.07	0	0	0	0	0	0
2964	Dichloromethane (methylene chloride)	0.005	0	0	0	0	0	0
2992	Ethylbenzene	0.7	0	0	0	0	0	0
2989	Monochlorobenzene	0.1	0	0	0	0	0	0
2968	o-Dichlorobenzene	0.6	0	0	0	0	0	0
2969	p-Dichlorobenzene	0.075	0	0	0	0	0	0
2996	Styrene	0.1	0	0	0	0	0	0
2987	Tetrachloroethylene	0.005	0	0	0	0	0	0
2991	Toluene	1	0	0	0	0	0	0
2979	Trans-1,2-Dichloroethylene	0.1	0	0	0	0	0	0
2984	Trichloroethylene	0.005	0	0	0	0	0	0
2976	Vinyl Chloride	0.002	0	0	0	0	0	0
2955	Xylenes (Total)	10	0	0	0	0	0	0
	Totals		0	0	0	0	0	0

MCL = maximum contaminant level

RTC = returned to compliance

* The 21 VOCs are typically sampled and reported as a group

Table 5. Violations for Synthetic Organic Contaminants (2016)

Table 5. Violations for Synthetic Organic Contaminants (2016)								
Contaminant			MCL Violations			Monitoring Violations		
Code	Name	MCL (mg/L)	# Vios	# Vios RTC	# of Systems with Vios	# Vios	# Vios RTC	# of Systems with Vios
2063	2,3,7,8-TCDD(dioxin)	3x10-8	0	0	0	0	0	0
2105	2,4-D (Formula 40, Weedar 64)	0.07	0	0	0	0	0	0
2110	2,4,5-TP (Silvex)	0.05	0	0	0	0	0	0
2051	Alachlor (Lasso)	0.002	0	0	0	0	0	0
2050	Atrazine (Atranax, Crisazina)	0.003	0	0	0	0	0	0
2306	Benzo(a)pyrene	0.0002	0	0	0	0	0	0
2046	Carbofuran (Furdan, 4F)	0.04	0	0	0	0	0	0
2959	Chlordane	0.002	0	0	0	0	0	0
2031	Dalapon	0.2	0	0	0	0	0	0
2035	Di(2-ethylhexyl)adiphate	0.4	0	0	0	0	0	0
2039	Di(2-ethylhexyl)phthalate	0.006	0	0	0	0	0	0
2931	Dibromochloropropane (DBCP, Nemaforme)	0.0002	0	0	0	0	0	0
2041	Dinoseb	0.007	0	0	0	0	0	0
2032	Diquat	0.02	0	0	0	0	0	0
2033	Endothall	0.1	0	0	0	0	0	0
2005	Endrin	0.002	0	0	0	0	0	0
2946	Ethylene Dibromide (EDB, Bromofume)	0.00005	0	0	0	0	0	0
2034	Glyphosate	0.7	0	0	0	0	0	0
2065	Heptachlor (H-34, Heptox)	0.0004	0	0	0	0	0	0
2067	Heptachlor Epoxide	0.0002	0	0	0	0	0	0
2274	Hexachlorobenzene	0.001	0	0	0	0	0	0
2042	Hexachlorocyclopentadiene	0.05	0	0	0	0	0	0
2010	Lindane	0.0002	0	0	0	0	0	0
2015	Methoxychlor (DMDT, Marlato)	0.04	0	0	0	0	0	0
2036	Oxamyl (Vydate)	0.2	0	0	0	0	0	0
2326	Pentachlorophenol	0.001	0	0	0	0	0	0
2040	Picloram	0.5	0	0	0	0	0	0
2384	Polychlorinated biphenyls (PCB, Aroclor)	0.0005	0	0	0	0	0	0
2037	Simazine	0.004	0	0	0	0	0	0
2020	Toxaphene	0.003	0	0	0	0	0	0
	Totals		0	0	0	0	0	0

MCL = maximum contaminant level

RTC = returned to compliance

**Table 6. Total Coliform Rule Violations
(January – March 2016)**
(CWS, NTNCWS, & TNCWS)

Violation Name	MCL	# of Vios	# Vios RTC	# of Systems with Vios**
MCL, Acute (Fecal Coliform) Violation type 21	Absence	0	0	0
MCL, Monthly (Total Coliform) * Violation type 22	Absence	19	19	19
Monitoring, Routine and Repeat Major Violation types 23 – 26	N/A	14	14	7
Totals		33	33	26

MCL = maximum contaminant level

RTC = returned to compliance

* For a system that serves 33,000 people or fewer and collects less than 40 samples per month, two positive samples in one compliance period is a violation. For a system that serves more than 33,000 people, greater than 5% of the samples testing positive in one compliance period is a violation.

**Table 6A. Revised Total Coliform Rule Violations
(April – December 2016)**
(CWS, NTNCWS, & TNCWS)

Violation Name	MCL/TT/ M&R	# of Vios	# Vios RTC	# of Systems with Vios**
MCL, Acute (Fecal Coliform) Violation type 1A	MCL (Absence)	5	4	4
Level 1 Assessment Violation type 2A (Severity = Non Acute)	TT	4	3	3
Level 2 Assessment Violation type 2B	TT	1	1	1
Corrective/Expedited Actions Violation type 2C	TT	1	1	1
Monitoring, Routine Violation type 3A (Severity = Major)	M&R	295	261	201
Report Sample Result/Failure to Monitor Violation type 4B	M&R	39	39	38
Totals		345	309	247*

MCL = maximum contaminant level

TT = treatment technique

M&R = Monitoring and Reporting

RTC = returned to compliance

* One system had multiple monitoring violations under the RTCR

Table 7. Ground Water Rule Violations (2016)

Violation Name	# of Vios	# Vios RTC	# of Systems with Vios
Monitoring of Source Water M/R (violation type 34)	2	2	2
Public Notice (violation type 73, 75, or 76)	0	0	0
Failure to Address Deficiency (violation type 45)	3	3	3
Failure to Address Contamination (violation type 48)	1	1	1
Totals	6	6	6

RTC = returned to compliance

Treatment Technique Compliance

Under the National Primary Drinking Water Regulations, the EPA has established treatment technique requirements in lieu of an MCL for some regulations. Treatment techniques are processes that are intended to reduce the level of a contaminant through water treatment or other requirements by a water system.

In 2016, one system failed to meet the disinfection byproduct precursor removal standard under the Disinfection Byproduct Rule. See Table 8. Nineteen systems had Lead and Copper Rule (LCR) treatment technique violations for Lead Public Education. Two systems had Surface Water Treatment Rule treatment technique violations for exceeding the 1 NTU standard and failure to maintain microbial treatment. See Tables 9 and 10.

Disinfection Byproduct Rule All community and non-transient non-community water systems that add a disinfectant (other than UV light) and transient non-community water systems that treat with chlorine dioxide are required to sample for haloacetic acids (HAA5) and total trihalomethane (TTHM). Water systems that use surface water as their drinking water source are required to provide sedimentation, and filtration to reduce disinfection byproduct precursors that are likely to form disinfection byproducts with the addition of chlorine. In 2016, six community water systems had MCL violations for disinfection byproducts. One water system had a treatment technique (TT) violation for disinfection byproduct precursors.

Table 8. Disinfection Byproduct Rule Violations (2016)								
Contaminant			MCL/TT Violations (violation types 02 and 46)			Monitoring Violations (violation type 27)		
Code	Name	MCL (mg/L)	# of Vios	# Vios RTC	# of Systems with Vios	# of Vios	# Vios RTC	# of Systems with Vios
2950	Total Trihalomethanes	0.08	8	8	3	0	0	0
2456	Haloacetic Acids (5)	0.06	4	4	2	0	0	0
2920	Total Organic Carbon - TT	N/A	3	3	1	1	1	1
0999	Chlorine Residual - MRDL	4	0	0	0	0	0	0
Totals			15	15	6*	1	1	1*

MCL = maximum contaminant level; RTC = returned to compliance

* Some systems had violations in multiple categories and were counted once; there are 6 systems with DBP MCL/TT Violations and one system with DBP Precursor Monitoring Violations

Lead and Copper Rule Community and non-transient non-community water systems are required to treat their water if it is found to be corrosive and/or if the source water contains unacceptable levels of lead or copper. Based on a system’s population, five to 100 samples are collected at homes or sample locations with the highest probability of elevated lead concentrations. This is determined based on a survey of when buildings were constructed and/or when plumbing is installed (i.e. If the service line leading to the building contains lead and/or if the interior plumbing of the building contains lead pipes or lead solder). Lead solder was prohibited from use in water system plumbing beginning in the mid-1980s. A water system’s sample results for the compliance period cannot exceed the Action Level (AL) for lead or copper in more than 10 percent of the samples. Although exceeding the AL is not a violation, follow-up actions, such as lead public education and treatment recommendations, are required. In 2016, 19 systems failed to conduct required lead public education activities (see Table 9).

Table 9. Lead and Copper Violations (2016)

Violation Name	# of Vios	# Vios RTC	# of Systems with Vios
Initial Tap Sampling for Lead and Copper M/R (violation type 51)	4	4	4
Follow-up or Routine Tap Sampling M/R (violation type 52)	102	87	100
Lead Public Education TT (violation type 65)	22	18	19
Treatment Installation TT (violation type 58)	0	0	0
Totals	128	109	123*

RTC = returned to compliance

of Vios = Number of violations that occurred in 2016 plus number of ongoing, unresolved violations

* Some systems had violations in multiple categories and were counted multiple times; there are fewer than 123 systems with LCR violations in these categories

Surface Water Treatment Rule Water systems that use surface water as their drinking water source are required to provide filtration and disinfection. The treatment process is monitored throughout each day, and reported monthly to the State. Table 10 outlines the Surface Water Treatment Rule violations for 2016. One water system exceeded the turbidity standards for treatment technique. Maryland does not have any water systems that are approved to use an unfiltered surface water source.

Maryland continues to evaluate new ground water systems for vulnerability to surface water contamination. Untreated raw water samples are analyzed for *E. coli*, turbidity, temperature, and pH. If a ground water source is determined to be under the direct influence of surface water, the water system has 18 months to install treatment or to replace the wells with an approved water source.

Under the Long Term 2 Surface Water Treatment Rule (LT2SWTR), the Schedule 1, 2, and 3 water systems that serve over 10,000 persons are in the process of sampling and reporting source water test results for *Cryptosporidium* and *E. coli*.

Table 10. Surface Water Treatment Rule Violations (2016)				
Type of System	Violation Name	# of Vios	# Vios RTC	# of Systems with Vios
Filtered Water Systems	Treatment Technique – Failure to Maintain Microbial Treatment (violation type 41)	1	1	1
Filtered Water Systems	Treatment Technique - Exceeds 1 NTU (violation type 43)	1	1	1
Filtered Water Systems	Treatment Technique - Exceeds 0.3 NTU (violation type 44)	0	0	0
Filtered Water Systems	Monitoring, Routine/Repeat (violation type 36)	0	0	0
Filtered Water Systems	Turbidity Monitoring, Filtered (violation type 38)	0	0	0
Filtered Water Systems	Treatment Technique – Failure to Submit Report – LT2SWTR (violation type 33)	0	0	0
Filtered Water Systems	Monitoring, Source Water – Cryptosporidium (violation type 32)	0	0	0
Unfiltered Water Systems	Treatment Technique - Failure to Filter – GWUDI (violation type 42)	0	0	0
Totals		2	2	2

RTC = returned to compliance

Variations

A primacy state can grant a PWS a variance from a primary drinking water regulation if the characteristics of the raw water sources reasonably available to the PWS do not allow the system to meet the MCL. To obtain a variance, the system must agree to install the best available technology, treatment techniques, or other means of limiting drinking water contamination that the Administrator finds are available (taking costs into account), and the state must find that the variance will not result in an unreasonable risk to public health. At the time the variance is granted, the state must prescribe a schedule that the PWS will follow to come into eventual compliance with the MCL. Small systems may also be granted variances if they cannot afford (as determined by application of the Administrator's affordability criteria) to comply with certain MCLs (non-microbial, promulgated after January 1, 1986) by means of treatment, alternative source of water, restructuring, or consolidation. Small systems are allowed three years to install and operate EPA approved small system variance technology. The variance must be reviewed not less than every five years to determine if the system remains eligible for the variance. In 2016, no variances were granted by MDE.

Exemptions

A primacy state can grant an exemption temporarily relieving a PWS of its obligation to comply with an MCL, treatment technique, or both if the system's noncompliance results from compelling factors (which may include economic factors) and the system was in operation on the effective date of the MCL or treatment technique requirement. A new PWS that was not in operation on the effective date of the MCL or treatment technique requirement by that date may be granted an exemption only if no reasonable alternative source of drinking water is available to the new system. Neither an old or a new PWS is eligible for an exemption if management or restructuring changes can reasonably be made that will result in compliance with the SDWA or improvement of water quality, or if the exemption will result in an unreasonable risk to public health. The state will require the PWS to comply with the MCL or treatment technique as expeditiously as practicable, but not later than three years after the otherwise applicable compliance date. In 2016, no exemptions were granted by MDE.

Consumer Confidence Report (CCR) Compliance

Every community water system is required to deliver to its customers a brief annual water quality report. This report is required to include some educational material, and provides information on the source water, the levels of any detected contaminants, and compliance with drinking water regulations. Systems that failed to submit their CCRs by the July 1 compliance deadline were contacted by telephone by the WSP staff. Table 11 presents a summary of the Consumer Confidence Report Reporting Violations.

Violation Name	# of Vios	# Vios RTC	# of Systems with Vios
Failure to Produce or Deliver Report (violation type 71)	2	2	2
Adequacy, Availability, Content or Certification (violation type 72)	7	7	7
Totals	9	9	8*

* One system had violations in multiple categories and was counted once

Conclusion

Maryland public water systems maintain a high level of compliance with all Safe Drinking Water Act requirements. This high rate of compliance could be attributed to the strong oversight of the Water Supply Program's dedicated staff, and support by the Department in meeting the federal and state requirements. In general, compliance is more difficult for smaller systems, which struggle both financially and technically to meet a continually increasing number of complex regulations. MDE's technical assistance approach is aimed at helping all public drinking water systems to achieve the highest possible level of public health protection.

Attachment 1

DEFINITIONS

Filtered Systems Water systems that have installed filtration treatment [40 CFR 141, Subpart H].

Inorganic Contaminants 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 categories:

Initial lead and copper tap monitoring and reporting: SDWIS Violation Code 51 indicates that a system did not meet initial lead and copper testing requirements, or failed to report the results of those tests to the State.

Follow-up or routine lead and copper tap monitoring and reporting: SDWIS Violation Code 52 indicates that a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.

Public education: SDWIS Violation Code 65 shows that 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 (parts 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 and 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 no results are reported during a compliance period. A major monitoring violation for the surface water treatment rule occurs when at least 90% of the required samples are not taken or results are not reported during the compliance period.

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

Public Water System A Public Water System (PWS) is defined as a system that provides water via piping or other constructed conveyances for human consumption to at least 15 service

connections or serves an average of at least 25 people for at least 60 days each year. There are three types of PWSs. PWSs can be community (such as towns), non-transient non-community (such as schools or factories), or transient non-community systems (such as rest stops or parks). For this report when the acronym “PWS” is used, it means systems of all types unless specified in greater detail.

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

Gross alpha: SDWIS Contaminant Code 4000 for alpha radiation above MCL of 15 picoCuries/liter (pCi/L). Gross alpha includes radium-226 but excludes radon and uranium.

Combined radium-226 and radium-228: SDWIS Contaminant Code 4010 for combined radiation from these two isotopes above MCL of 5 pCi/L.

Gross beta: SDWIS Contaminant Code 4100 for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.

Uranium: SDWIS Contaminant Code 4006 for total Uranium above MCL of 30 µg/L.

Reporting Interval The WSP Annual Compliance Report is submitted to EPA by July 1 of each year, and reports violations for the previous calendar year.

SDWIS Code Specific numeric codes from the Safe Drinking Water Information System (SDWIS) have been assigned to each violation type included in this report. The violations to be reported include exceeding contaminant MCLs, failure to comply with treatment requirements, and failure to meet monitoring and reporting requirements. Four-digit SDWIS Contaminant Codes have also been included in the chart for specific MCL contaminants.

Surface Water Treatment Rule The 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 categories:

Monitoring, routine/repeat (for filtered systems): SDWIS Violation Code 38 indicates a system’s failure to carry out required tests, or to report the results of those tests.

Treatment techniques: SDWIS Violation Code 41 shows a system’s failure to properly treat its water. States report Code 41 for filtered and unfiltered systems to EPA.

Failure to filter (for unfiltered systems): SDWIS Violation Code 42 shows a system’s failure to properly treat its water.

Total Coliform Rule (TCR) The Total Coliform Rule 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:

Acute MCL violation: SDWIS Violation Code 21 indicates that the system found fecal coliform or E. coli, potentially harmful bacteria, in its water, thereby violating the rule.

Non-acute MCL violation: SDWIS Violation Code 22 indicates that the system found total coliform in samples of its water at a frequency or at a 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% of the samples positive for total coliform is a violation.

Major routine and follow-up monitoring: SDWIS Violation Codes 23 and 25 show that a system did not perform any monitoring.

Sanitary Survey: SDWIS Violation Code 28 indicates a sanitary survey was not performed.

Treatment Technique A water treatment process that EPA requires instead of an 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].

Violation A failure to meet any State or federal drinking water regulation.