

Pennsylvania Public Water System Compliance Report for 2020

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Pennsylvania Compliance Report for 2020 Public Water System

1.

Introduction to Pennsylvania's Safe Drinking Water Program

Section 1414(C)(3)(A)(i) of the amended federal Safe Drinking Water Act (SDWA) requires States with primacy to prepare and submit to the U.S. Environmental Protection Agency (EPA) an annual report on public water system violations. This report fulfills that requirement by providing a summary of the incidence of Pennsylvania public water system (PWS) maximum contaminant level (MCL), maximum residual disinfectant level (MRDL), significant monitoring/reporting (M/R), treatment technique (TT), consumer confidence report rule (CCR), and public notification (PN) violations for the calendar year 2020. The level of compliance and efforts being undertaken to provide safe drinking water to the residents and travelers of Pennsylvania are also highlighted. The full report is available on the Department of Environmental Protection (DEP) web site and in hard copy. See the last page of this report for details on how to obtain additional information.

Public Water System Definitions

Bottled Water System: A PWS which provides water for bottling in sealed bottles or other sealed containers.

Bulk Water Hauling System: A PWS which provides water piped into a carrier vehicle and withdrawn by a similar means into the user's storage facility or vessel.

BVRB Water System: A Bottled, Vended, Retail or Bulk Public Water System

Community Water System (CWS): A PWS that provides water to the same population year-round. Examples are municipal systems, authorities, and mobile home parks or residential developments with their own water supplies.

- **Large CWS** - Serves greater than 50,000 people.
- **Medium CWS** - Serves 3,301 - 50,000 people.
- **Small CWS** - Serves 3,300 or fewer people.

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

Nontransient Noncommunity Water System (NTNCWS): A PWS that is not a CWS, but that regularly serves at least 25 of the same people at least six months of the year. Examples include schools, factories, and hospitals that have their own water supplies.

Public Water System (PWS): A system that provides piped water 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. PWSs can be community, nontransient noncommunity, or transient noncommunity systems.

Retail Water Facility: A PWS which provides water for bottling without the use of a water vending machine by dispensing unit servings of water in containers whether or not the containers are provided by the customers.

Transient Noncommunity Water System (TNCWS): A system that caters to transitory customers in non-residential areas such as campgrounds, motels, and restaurants having their own water supplies.

Vended Water System: A PWS which provides water for bottling through the use of one or more water vending machines.

Background

Under the authority of the 1974 Safe Drinking Water Act (SDWA), the EPA established the Public Water System Supervision (PWSS) Program. With the 1986 Amendments to the SDWA, EPA set 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). For some regulations, EPA established a treatment technique in lieu of an MCL to control unacceptable levels of contaminants in drinking water. The Agency's regulations also establish how often public water systems 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 requirements. In addition, EPA requires some/certain PWSs to monitor for unregulated contaminants to provide data for future regulatory development. Finally, EPA requires public water systems to notify the public when they have violated these regulations. The 1996 amendments to the SDWA require public notification to include a clear and understandable explanation of the nature of the violation, its potential adverse health effects; steps that the public water system is undertaking to correct the violation and the possibility of alternative water supplies during the violation.

Drinking water first came under regulation in Pennsylvania in 1905 with the passage of the Public Water Supply Law. The 1905 law was passed in response to widespread disease outbreaks that had been attributed to microbiological contamination of public water supplies. Approximately 1,200 systems were regulated under the law for about 20 contaminants for which the U.S. Public Health Service had established drinking water standards. Public water supplies were regulated under the 1905 law for almost 80 years when a new wave of waterborne disease outbreaks necessitated the establishment of better authorities to protect public health.

The SDWA allows states and territories to seek EPA approval (primacy) to administer their own PWSS programs. The Pennsylvania Safe Drinking Water Act was signed into law in 1984 after several communities experienced waterborne disease outbreaks caused by the presence of Giardia in their drinking water. In the following year Pennsylvania was awarded primacy under the SDWA. The DEP's Bureau of Safe Drinking Water administers the PWSS program. Under the 1905 Public Water Supply Law, Pennsylvania led the nation in waterborne disease outbreaks, averaging eight to ten per year. Today, DEP regulates nearly 8,400 public water systems serving over eleven million people. Through improved water quality regulation under the 1984 Act, waterborne disease outbreaks are now a very rare occurrence in Pennsylvania's public water systems.

In addition to this report, DEP prepares a separate semi-annual report on the financial, technical and educational assistance programs for Pennsylvania’s water systems. These reporting requirements are part of DEP’s work plan obligations under the set-aside grant for the drinking water program.

Sources of Drinking Water Contamination

Contaminants may enter drinking water before, during, or after treatment. The majority of PWSs treat their water, as necessary, to ensure that their customers receive water that meets drinking water standards. Some sources of drinking water contaminants are as follows:

Before Treatment

- Bacteria, viruses and protozoa from human or animal sources
- Turbidity in water caused by suspended matter such as clay, silt, and microscopic organisms
- Inadequately treated wastewater, sanitary sewer overflows, and leaking sewer lines, malfunctioning septic systems
- Defective storage tanks
- Leaking hazardous landfills, ponds, and pits
- Pesticides, fertilizers, and other agricultural run-off
- Run-off from oil-slicked or salt-treated highways
- Underground injection of hazardous wastes
- Underground storage tanks
- Naturally-occurring metals such as arsenic and cadmium
- Decay products of naturally-occurring radionuclides such as radon, radium, and uranium
- Industrial chemicals such as solvents

During Treatment

- Treatment malfunction or chemical overfeed
- By-products of disinfectants such as trihalomethanes and haloacetic acids

After Treatment

- Lead, copper, asbestos, and other materials from corroding pipes
- Microbes and sediment entering through leaking pipes, joints and valves, or water line breaks
- Improper connections with other systems or cross-connections with non-potable water that allow contaminants to enter drinking water pipes
- Permeation of contaminants through certain pipe materials
- Microbes and other contaminants entering through or accumulating within inadequately operated or maintained storage tanks
- Disinfection byproducts, depleted disinfectant residuals, microbial re-growth, biofilm growth, or nitrification from inadequate operation or maintenance of distribution systems

Improved Public Health Protection

The reduction in waterborne disease outbreaks in Pennsylvania over the last 31 years is due in part to Pennsylvania’s filtration requirements. On March 25, 1989, when the Commonwealth of Pennsylvania adopted the filtration regulations, 231 public water systems were using unfiltered surface water sources. These systems ultimately filtered or abandoned the sources. Filtration plants have been constructed for nearly

all of the state's unfiltered surface water sources. Currently, only 7 unfiltered surface and groundwater under the direct influence of surface water (GUDI) systems remain, the number of surface and GUDI filtration plants in Pennsylvania is now 340. Pennsylvanians benefit from the improved public health protection provided by these filtration plants. The Surface Water Treatment Rule has been revised several times to increase public health protection. Most recently the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) is being implemented to increase the public's protection from diseases associated with *Cryptosporidium* and other disease-causing microorganisms in drinking water.

To assure that Pennsylvania's filtration plants maximize public health protection for their customers, DEP initiated the Filter Plant Performance Evaluation Program in 1988. DEP is also helping to prevent waterborne diseases through the Partnership for Safe Water Program and the Area Wide Optimization Program. These programs are a cooperative effort between DEP and plant personnel to assure workers optimize the inactivation and removal of disease-causing organisms at their facilities.

In 2018, DEP further strengthened microbial protection by promulgating the Disinfection Requirements Rule (DRR). The DRR protects public health through a multiple barrier approach designed to guard against microbial contamination by ensuring the adequacy of treatment designed to inactivate microbial pathogens and by ensuring the integrity of drinking water distribution systems. The DRR requires CT/log inactivation monitoring and reporting at all filter plants and includes strengthened disinfection requirements within the distribution system by requiring a minimum residual of 0.2 mg/L throughout the distribution system, development of a DRR sampling plan, and development of a nitrification control plan for systems using chloramines.

In addition to these special efforts to improve the microbiological safety of drinking water, DEP currently regulates 97 primary contaminants and 15 secondary contaminants – an increase from about 20 in 1984. Current regulations are set for 16 inorganic contaminants, 5 radionuclides, turbidity, 8 microbial contaminants or indicator organisms, 3 disinfectants, 11 disinfection byproducts and 53 organic contaminants. Primary maximum contaminant levels (MCLs) have been set for 87 contaminants, secondary MCLs have been set for 15 contaminants and 10 contaminants have treatment technique requirements. See Chapter 2 for additional information.

Waterborne Disease Outbreaks

The Pennsylvania DEP has the responsibility of assuring that the drinking water industry delivers a safe and reliable supply of water to consumers through efficiently and effectively operated facilities. Water systems that derive some or all of their drinking water from surface water sources (including GUDIs) serve over 10 million Pennsylvanians as well as millions of visitors to the state. Pennsylvania has a tremendous interest in the potential for waterborne diseases related to public water supplies. Between 1971 and 1980, Pennsylvania reported 20 percent of all waterborne outbreaks in the United States – more than any other state in the nation. These outbreaks had widespread health implications and cost families, businesses, and local/state governments millions of dollars. Decades ago the more significant outbreaks took place among communities that were served unfiltered surface or GUDI source water. Coinciding with the adoption of Pennsylvania's mandatory surface water filtration regulation, the number of reported waterborne disease outbreaks started to trend on a steep decline. See Figure 1. According to the Pennsylvania Department of Health, no waterborne disease outbreaks related to public drinking water supplies were reported in Pennsylvania during the period of 2007 through 2009.

Since 2010 we have noticed a new trend in reported outbreaks. CDC's outbreak reporting system known as NORS (National Outbreak Reporting System) was launched in 2009 as a web-based platform into which health departments enter outbreak information. Through NORS, CDC collects reports of enteric disease outbreaks caused by bacterial, viral, parasitic, chemical, toxin, and unknown agents, as well as waterborne

outbreaks of non-enteric disease. This transition into electronic disease reporting of waterborne outbreaks took place 2009/2010. That is not to say that outbreaks of waterborne illness did not occur prior to this or were not documented, but this has certainly increased recognition and detailed reporting of waterborne outbreaks when they occur in the state. Since 2010, one (1) documented *cryptosporidiosis* outbreak, and twenty-eight (28) documented legionella pneumophila outbreaks have occurred in the Commonwealth. Since the transition to NORS, reports of legionella pneumophila outbreaks have become a regular occurrence nearly every single year.

During 2020 there was 1 outbreak reported that was related to public water supplies. The true number of actual outbreaks may be higher since not all outbreaks are recognized, investigated, and then reported to state or federal agencies. The Pennsylvania Department of Health provides DEP with current information on waterborne disease outbreaks. The sensitivity of the disease surveillance system is affected by the following factors: the size of the outbreak; severity of disease caused by the outbreak; public awareness of the outbreak; routine laboratory testing for organisms; requirements for reporting cases of diseases; and resources available to the local health departments for surveillance and investigation of probable outbreaks. Thus, the surveillance system probably underreports the true number of outbreaks due to these factors. With the help of local public health agencies, DEP and the Pennsylvania Department of Health are continuing to improve the state's disease detection, investigation and reporting system. Additional details regarding the 2020 public water supply outbreaks are shown below:

Outbreak 1

The Pathogen/Organism: Legionella

Number of Cases: 3

Number of Hospitalizations: 3

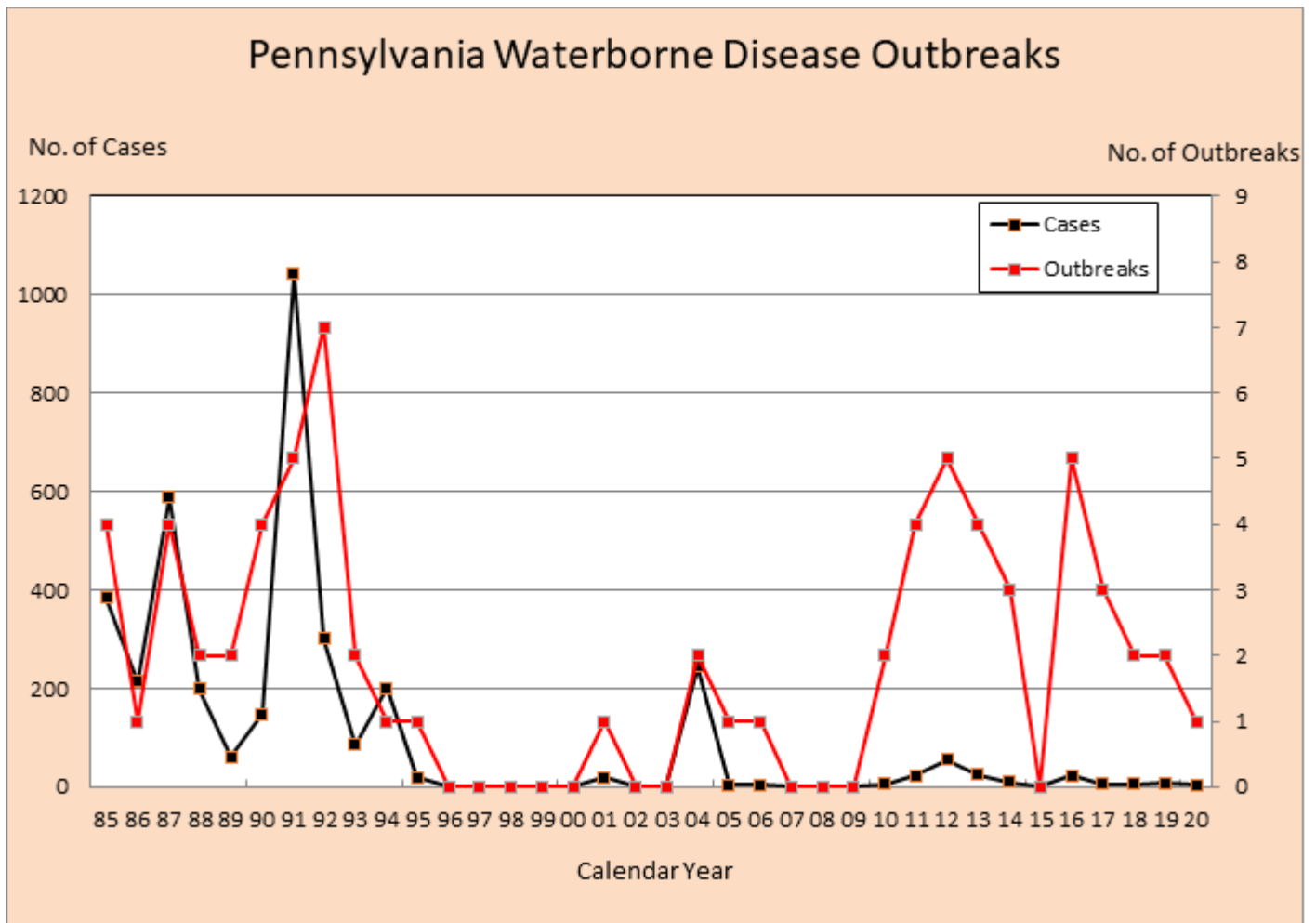
Number of Deaths: 0

Mode of Transmission: waterborne

Underlying Deficiency (untreated ground water, distribution system, etc.): None identified or reported

The following graph in Figure 1. shows the occurrence of waterborne disease outbreaks in Pennsylvania that were caused by viruses, bacteria and protozoa—the three main culprits in disease outbreaks. The graph reveals an increasing trend during recent years which is largely the result of increased reporting of legionella pneumophila outbreaks. Although legionella pneumophila outbreaks likely occurred prior to 2010, public water supplies were not reported as being the probable source. Other factors contributing to the recent increase in cases might include a true increase in disease transmission, greater use of diagnostic testing, and/or increased reporting. Waterborne disease outbreaks related to non-potable sources such as swimming and bathing facilities are not included in this graph.

Figure 1. Pennsylvania Waterborne Disease Outbreaks



Reducing Lead in Drinking Water

Water coolers and home plumbing have long been identified as sources of lead in drinking water. Under the Lead and Copper Rule, DEP is working with water systems to reduce lead levels that may be caused by the distribution system and household plumbing fixtures by requiring treatment to address the corrosiveness of the water.

Additionally, DEP has been implementing a surveillance program under the Pennsylvania Plumbing System Lead Ban and Notification Act (Lead Ban Act) since 1991. Under this legislative initiative, materials not meeting the definition of “lead-free” are banned from sale or use in all plumbing systems in Pennsylvania. Additionally, the Lead Ban Act prohibits the sale or use of 50/50 and 85/15 tin-lead acid core or solid wire solders, any leaded solder that does not have a label which includes the content of lead, and any leaded solder that does not contain a warning statement on the label. The Lead Ban Act also restricts the use of all other leaded solders to non-plumbing uses.

Lead Ban surveillance activities have been done throughout the Commonwealth by summer interns for almost 30 years. The annual surveillance conducted by an intern is the most effective method of educating the business community about the requirements of the Lead Ban Act. These surveillance activities include locating hardware stores, home centers, and other retail facilities in which solder is sold and educating these

facilities (as well as solder wholesalers and manufacturers) of the provisions of the Lead Ban Act. In the mid 2000's, surveillance activities were expanded to also include electronics, craft and auto parts stores that sell solder. There has been a significant reduction of the availability of banned solder (and in the number of facilities out of compliance) as a result of this effort because the majority of stores in violation of the Lead Ban Act are first time offenders.

Due to the pandemic emergency and the stay-at-home orders declared in 2020, lead ban surveillance site visits were not conducted. However, as part of an amended work plan agreement with EPA Region 3, reminder letters were sent to all facilities that had been out of compliance during the past five years (2015-2019). These letters were sent to 99 facilities throughout Pennsylvania. Surveillance activities will begin again in 2021.

Monitoring/Reporting Requirements

All public water systems are required to supply drinking water that complies with the primary and secondary MCLs. However, monitoring and reporting (M/R) requirements are specific to each system type. All public water systems, at a minimum, conduct routine monitoring for total coliform bacteria, nitrate and nitrite, and if using a surface water source, conduct monitoring for other microbiological contaminants. In addition, CWSs and NTNCWSs conduct routine monitoring for other chemicals and radiological contaminants. DEP may require any public water system to conduct additional monitoring if DEP has reason to believe that the public water system is not in compliance with the MCLs, MRDLs, or treatment technique requirements.

In addition to MCL, MRDL, and TT violations, this Annual Compliance Report summarizes the number of *significant* M/R violations that occurred during the report year. For this report, significant M/R violations are generally defined as having taken no samples or no results were submitted during a compliance period for a particular contaminant. For the Surface Water Treatment Rule, a significant M/R violation occurs when fewer than 90% of the required samples are taken or no results are reported during a reporting interval.

Variations and Exemptions

Variations and exemptions to specific requirements under the Safe Drinking Water Act may be granted under certain circumstances. Occasionally, a public water system cannot meet the MCL due to the characteristics of the raw water sources, and no alternate sources are reasonably available. In such cases, a primacy state can grant the public water system a variance from the applicable primary drinking water regulation upon finding that the system has installed and is using the best available technology, treatment techniques, or other means which the EPA Administrator finds are available (cost is not a consideration in Pennsylvania). The state must find that the variance will not result in an unreasonable risk to health, and shall prescribe at the time the variance is granted a schedule in accordance with which the public water system must come into compliance with the MCL. In 2020, DEP received no new applications for a variance or exemption. There were no variations or exemptions in effect for any Pennsylvania public water systems during the 2020 report period.

Consumer Confidence Reports

To ensure that customers are aware of the quality of the drinking water supplied to them, community water systems are required to prepare an annual Consumer Confidence Report (CCR). The CCR covering calendar year 2019 was due by July 1, 2020. Details about CCR violations may be found in Figure 14 of this report. DEP continues to work with water suppliers to improve the timeliness and quality of CCRs.

Public Notification

Public water systems are required to issue public notification (PN) to their consumers in response to a violation of an MCL, MRDL or TT requirement; for monitoring/reporting violations; and for other emergency situations. Public notices must contain minimum elements, including a description of the violation, actions consumers should take, and when the supplier expects to return to compliance. A system can incur a PN violation for failure to issue a complete notice that is delivered on time and in a manner appropriate to the violation/situation. In 2020, there were 3717 violations. Charts and tables in following sections of this report show the PN violation count by the rule violated.

Regulation Development

DEP continues to provide training, outreach and compliance assistance for all existing safe drinking water rules. In 2018, DEP finalized two major regulation revisions to Chapter 109. The Disinfection Requirements Rule (DRR) incorporated requirements needed to obtain or maintain primacy for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2), the Stage 2 Disinfectants/ Disinfection Byproducts Rule (Stage 2 DDBP), and the Lead and Copper Rule Short-Term Revisions (LCRSTR). The DRR also strengthened disinfection requirements within the distribution system by requiring a minimum residual of 0.2 mg/L throughout the distribution system, development of a DRR sampling plan, and development of a nitrification control plan for systems using chloramines. The General Update and Fees Rule strengthened the treatment technique requirements for pathogens, clarified permitting requirements, added the regulatory basis for issuing general permits and added new requirements for alarms, shutdown capabilities, and system service and resiliency. The rule also set new annual fees for all public water systems and increased permit fees to augment state and federal funding.

The fourth Unregulated Contaminant Monitoring Rule (UCMR4) is a direct federal implementation rule that establishes a monitoring program to gather occurrence data on unregulated contaminants. UCMR4 was published in the Federal Register on December 20, 2016 and requires assessment monitoring for a list of 10 cyanotoxins and a list of 20 other contaminants including metals, pesticides, alcohols, semi-volatile chemicals and brominated halo-acetic acids. Public water systems conducted monitoring between 2018 and 2020 using analytical methods developed by EPA and consensus organizations. This monitoring provides a basis for future regulatory actions to protect public health. In Pennsylvania, a total of 221 public water systems participated in UCMR4 monitoring: 125 surface water systems serving more than 10,000 persons monitored for both the list of cyanotoxins and the list of additional contaminants; 41 surface water systems serving less than 10,000 persons monitored for cyanotoxins; 15 surface water systems serving less than 10,000 persons and a total of 40 groundwater systems monitored for the list of 20 additional contaminants.

2.

Public Water System Profile and Compliance Summary

The following pages display some fundamental Pennsylvania public water system statistics, a table of the incidence of MCL, MRDL, TT, and significant monitoring violations, and graphics to illustrate the general picture of public water system compliance in Pennsylvania in 2020.

Data in the federal Safe Drinking Water Information System (SDWIS) may differ from the information in this report. The 2020 report data originates in the Pennsylvania Drinking Water Information System (PADWIS) from a snapshot dated June 10, 2021. DEP transmits the violation data from PADWIS to SDWIS several times a year. As a result, PADWIS and SDWIS may not match if the data extracts occurred on different dates. DEP is confident in the accuracy of the fundamental statistics for the incidence of MCL, MRDL, TT, and significant monitoring violations; and the general picture of public water system compliance in Pennsylvania.

General Statistics

- Total Population of Pennsylvania: 13,002,700
- Percent of Population Served by Individual Wells: 12%
- Percent of Population Served by Community Water Systems: 88%
- Greater than 90% of 104 drainage basins in Pennsylvania are used as sources for public water systems. Major river basins include the Delaware, Susquehanna, Potomac and Ohio.
- 478 ground water basins are located in Pennsylvania.
- 82% of the CWS population is covered by source water protection programs
- 98% of all CWS ground water sources have had a Surface Water Identification Protocol (SWIP) evaluation.*
- 1 confirmed waterborne disease outbreak occurred during 2020.
- 678 inspections (sanitary surveys) were performed.**
- 99.68% of the population served by CWSs with surface-water sources or ground water under the direct influence of surface water receives filtered water.*
- 78% (based on 141 out of 180) of WebOAS users (filter plants) met the annual combined filter effluent optimization goal of <0.10 NTU in 95% of daily maximum turbidity samples.
- 20 filter plants were evaluated during CY 2020.**
- 100% of all PWSs in PA were ranked and scored based on their system capability.
- 94% of the population served by CWSs is protected by optimized corrosion control.*
- 81% of all children at day-care and school facilities that have their own water supply are protected by optimized corrosion control treatment.*
- Over 99.9% of the population served by CWSs is protected from nitrate/nitrite.*
- Over 98.6% of the population of CWSs is protected from carcinogenic contaminants.*

* Statistics compiled in June 2021

** 2020 saw a reduction in the number of inspections and evaluations due to COVID-19 restrictions

Compliance Action Summary

Action	Number
Compliance Notices and NOV's	10,458
Consent & Administrative Orders	597
Consent Assessments	32
Boil Water Advisories (Community Systems)	56
Boil Water Advisories (Noncommunity Systems)	45
Civil Penalties Collected	\$90,639

This year, compliance actions in the table above are counted only once for each contaminant group for a public water system on a given date.

PWS Profile

Figure 2. Number of Pennsylvania Systems and Population Served by Size Category

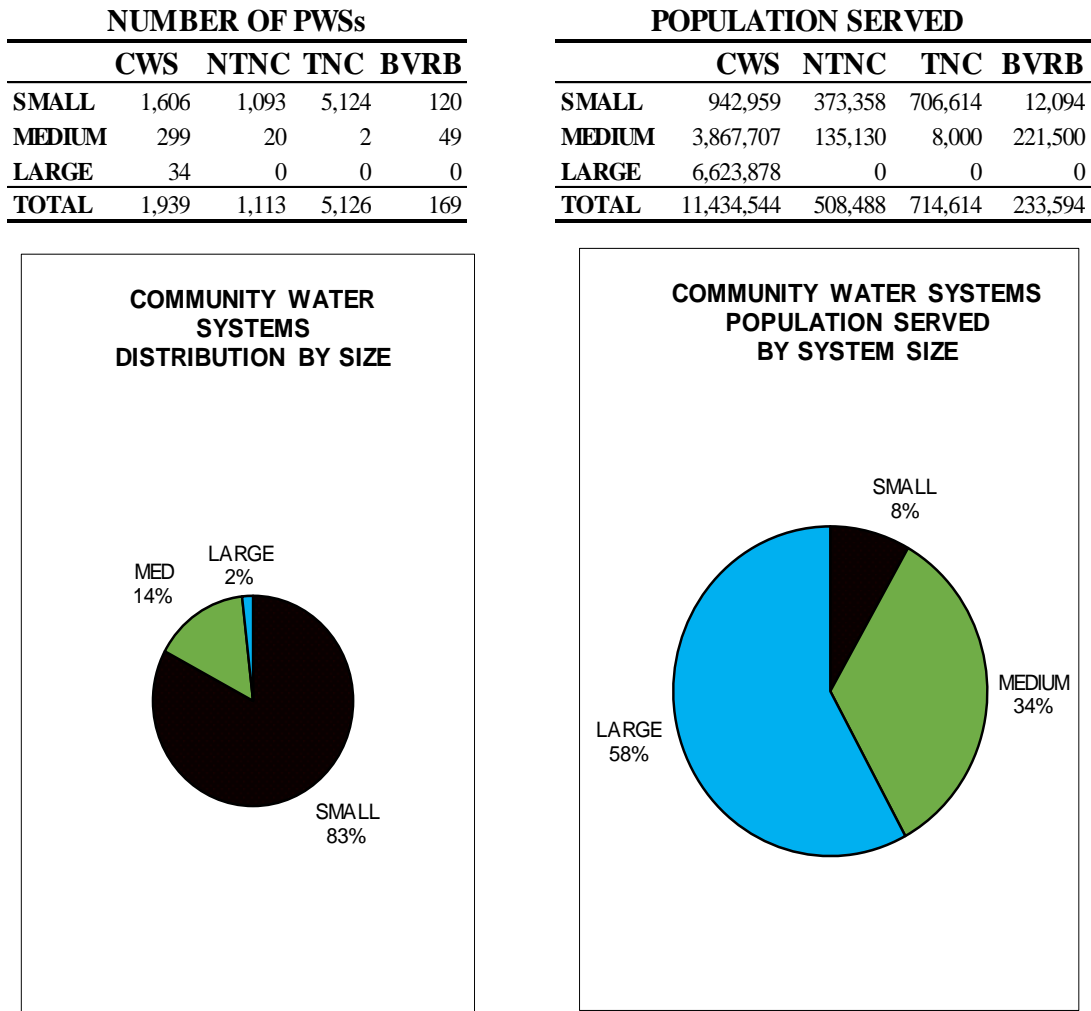


Figure 3. PWSs by Source and System Type

PWSs BY SOURCE AND SYSTEM TYPE										
	CWS		NTNC		TNC		BVRB		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
GROUND	1,469	75.8%	1,075	96.6%	5,104	99.6%	75	44.4%	7,723	92.5%
SURFACE	470	24.2%	38	3.4%	22	0.4%	94	55.6%	624	7.5%
TOTAL	1,939	100.0%	1,113	100.0%	5,126	100.0%	169	100.0%	8,347	100.0%

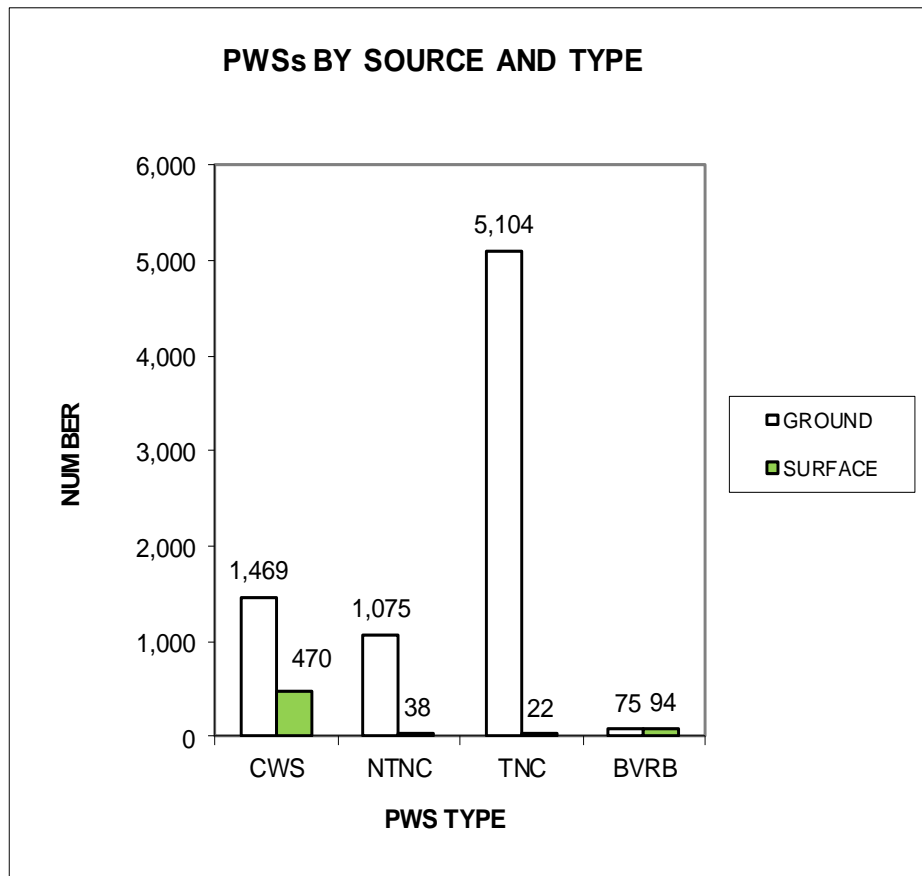
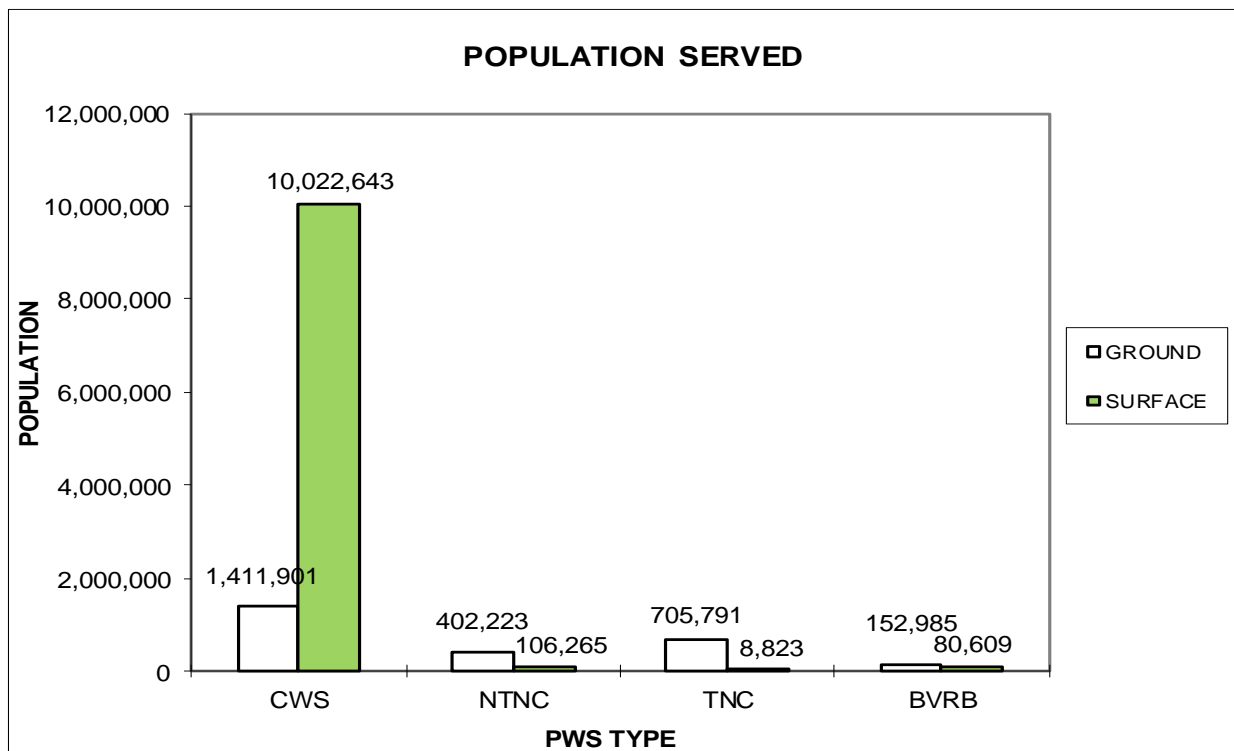


Figure 4. Population Served by Source Type

POPULATION SERVED BY SOURCE AND SYSTEM TYPE										
	CWS		NTNC		TNC		BVRB		TOTAL	
	POPL SERVED	%	POPL SERVED	%	POPL SERVED	%	POPL SERVED	%	POPL SERVED	%
GROUND	1,411,901	12.3%	402,223	79.1%	705,791	98.8%	152,985	65.5%	2,672,900	20.7%
SURFACE	10,022,643	87.7%	106,265	20.9%	8,823	1.2%	80,609	34.5%	10,218,340	79.3%
TOTAL	11,434,544	100.0%	508,488	100.0%	714,614	100.0%	233,594	100.0%	12,891,240	100.0%



Summary of Violations

Definitions The following definitions apply to the Summary of Violations table.

Consumer Confidence Reports (CCR): Community water systems must prepare annual water quality reports (CCRs or drinking water quality reports) for their customers. The first reports were due by October 1999. Subsequent reports are due each year by July 1. The reports tell where drinking water comes from, what has been detected in the water, and how consumers can help protect their source of water. Violations associated with CCRs are for late or missing reports, incomplete reports and missing certification forms. [40 CFR 141.151]

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

Ground Water Rule (GWR): The GWR provides increased protection against microbial pathogens, specifically viral and bacterial pathogens, in public water systems that use ground water sources. The goal of the GWR is to identify and target ground water systems that are susceptible to fecal contamination because such contamination is the likely source of viral and bacterial pathogens in drinking water supplies. [40 CFR 141.400]

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 16 inorganic contaminants [40 CFR 141.62].

Lead and Copper Rule (LCR): 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 corrosion of household pipes and plumbing fixtures. Pennsylvania reports violations of the LCR in the following six categories:

Consumer Tap Notice: A violation for a system's failure to issue a notice about the results to each consumer whose tap is sampled for compliance monitoring.

Initial lead and copper tap M/R: A violation where 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 M/R: A violation where a system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.

Treatment installation: Violations for a failure to install optimal corrosion control treatment system or source water treatment system which would reduce lead and copper levels in water at the tap. [One number is to be reported for the sum of violations in both categories].

Lead service line replacement: A violation for a system's failure to replace lead service lines on the schedule required by the regulation.

Public education: A violation where a system that exceeded the lead action level 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.

Maximum Residual Disinfectant Level (MRDL): The maximum permissible level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs 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 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 10% 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 runoff from cropland or discharge from factories. EPA has set legal limits on 53 organic contaminants that are to be reported [40 CFR 141.61].

Public Notification Rule: The PN Rule establishes criteria under which public water systems must issue notification to all consumers about violations that have occurred. The rule specifies specific content and delivery requirements and deadlines. PN violations occur when the public water system fails to issue a notice, the notice is incomplete or the certification that the notice was delivered is not submitted.

Radionuclides: Radioactive particles which can occur naturally in water or result from human activity. EPA has set legal limits on five radionuclides: gross alpha, radium-226, radium-228, uranium and beta particle/photon radioactivity [40 CFR 141].

Violations for these contaminants are to be reported using the following four categories:

Gross alpha: A running annual average value for alpha radiation above MCL of 15 picocuries/liter. Gross alpha includes radium-226 but excludes radon and uranium.

Combined radium-226 and radium-228: A running annual average value for combined radium from these two isotopes above MCL of 5 pCi/L.

Uranium: A running annual average value for alpha radiation above MCL of 30 ug/L.

Gross beta: A running annual average value for beta particle and photon radioactivity from man-made radionuclides above 4 millirem/year.

Reporting Interval: Annual Compliance Reports are to be submitted to EPA by July 1 for the preceding calendar year.

Stage 1 and Stage 2 Disinfectants/ Disinfection Byproducts Rules (DBPR): The Stage 1 and Stage 2 DBPRs apply to community water systems and non-transient non-community systems that add a chemical disinfectant or oxidant to the drinking water during any part of the treatment process. Violations of the Stage 1 and Stage 2 DBPRs are reported for the following categories: M/R, MCL and MRDL.

Surface Water Treatment Rule (SWTR): The SWTR 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]. The rule was amended in 2001 to include the Interim Enhanced SWTR requirements for surface water and GUDI systems serving at least 10,000 people. The rule was further amended in 2002 to include the Long Term 1 Enhanced SWTR requirements for surface water and GUDI systems serving less than 10,000 people. The rule was further amended in 2006 to include the Long Term 2 Enhanced SWTR requirements to increase the public's protection from diseases associated with *Cryptosporidium* and other disease-causing microorganisms in drinking water. Violations of the SWTR (labeled "Filter Rule" in Figures 10, 15, and 16) are to be reported for the following four categories:

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.

Treatment techniques (for filtered systems): A violation for a system's failure to properly treat its water.

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.

Failure to filter (for unfiltered systems): A violation for a system's failure to properly treat its water. Data for this violation code will be supplied to the States by EPA.

Revised Total Coliform Rule (RTCR): The federal RTCR took effect April 1, 2016 replacing TCR. The RTCR 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.

Acute MCL violation: A violation where the system found *E. coli*, potentially harmful bacteria, in its water, thereby violating the rule.

Major routine and follow-up monitoring: A violation where a system did not perform any monitoring. [One number is to be reported for the sum of violations in these two categories.]

RTCR Treatment Technique: RTCR added treatment technique requirements. Systems that fail to conduct a Level 1 or Level 2 Assessment within 30 days of triggering the assessment or fail to take corrective action for sanitary defects identified during an assessment incur a treatment technique violation. In addition, RTCR added a treatment technique for seasonal systems. Seasonal systems that fail to complete a start-up procedure including coliform monitoring prior to opening for the season incur a violation.

Treatment Techniques (TT): 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 SWTRs and LCR 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]. Pennsylvania requires all water systems with surface water sources to install filtration.

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

Figure 5.

Pennsylvania—SUMMARY OF VIOLATIONS
MCL and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2020 to December 31, 2020

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
ORGANIC CONTAMINANTS					
1,1,1-Trichloroethane	0.2	0	0	129	96
1,1,2-Trichloroethane	0.005	0	0	129	96
1,1-Dichloroethylene	0.007	1	1	129	96
1,2-Dichloroethane	0.005	0	0	129	96
1,2-Dichloropropane	0.005	0	0	129	96
1,2 Dibromo-3-Chloropropane (DBCP)	0.0002	0	0	141	78
1,2,4-Trichlorobenzene	0.07	0	0	129	96
2,3,7,8-TCDD (Dioxin)	3X10 ⁻⁸	0	0	208	104
2,4,5-TP (Silvex)	0.05	0	0	123	72
2,4-D	0.07	0	0	125	73
Alachlor (Lasso)	0.002	0	0	129	74
Atrazine	0.003	0	0	122	71
Benzene	0.005	0	0	130	97
Benzo (A) Pyrene	0.0002	0	0	129	74
BHC-gamma (Lindane)	0.0002	0	0	132	77
Carbofuran	0.04	0	0	119	68
Carbon Tetrachloride	0.005	0	0	129	96
Chlordane	0.002	0	0	127	75
cis-1,2-Dichloroethylene	0.07	0	0	130	97
Dalapon	0.2	0	0	120	70
Di(2-Ethylhexyl) Adipate	0.4	0	0	129	74
Di(2-Ethylhexyl) Phthalate	0.006	6	3	135	80
Dichloromethane (Methylene Chloride)	0.005	0	0	129	96
Dinoseb	0.007	0	0	121	69
Diquat	0.02	0	0	125	71
Endothall	0.1	0	0	121	68
Endrin	0.002	0	0	130	75
Ethylbenzene	0.7	0	0	130	97
Ethylene Dibromide (EDB)	0.00005	0	0	139	77
Glyphosate	0.7	0	0	115	66
Heptachlor	0.0004	0	0	131	76
Heptachlor Epoxide	0.0002	0	0	131	76
Hexachlorobenzene (HCB)	0.001	0	0	130	76

Pennsylvania Public Water System Compliance Report – 2020

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
Hexachlorocyclopentadiene	0.05	0	0	127	73
Methoxychlor	0.04	0	0	130	76
Monochlorobenzene (Chlorobenzene)	0.1	0	0	129	96
o-Dichlorobenzene	0.6	0	0	129	96
Oxamyl (Vydate)	0.2	0	0	119	69
p-Dichlorobenzene	0.075	0	0	129	96
Pentachlorophenol	0.001	0	0	123	70
Picloram	0.5	0	0	124	70
Simazine	0.004	0	0	130	76
Styrene	0.1	0	0	129	96
Tetrachloroethylene	0.005	0	0	130	97
Toluene	1	0	0	129	96
Total Polychlorinated Biphenyls (PCBS)	0.0005	0	0	166	88
Toxaphene	0.003	0	0	128	77
trans-1,2-Dichloroethylene	0.1	0	0	130	97
Trichloroethylene	0.005	0	0	130	97
Vinyl Chloride	0.002	0	0	0	0
Xylenes, Total	10	0	0	131	97
Subtotal		7	94	63619	33685
INORGANIC CONTAMINANTS					
Antimony, Total	0.006	0	0	23	22
Arsenic	0.010	10	7	44	39
Asbestos	7	0	0	30	21
Barium	2	4	2	26	25
Beryllium, Total	0.004	0	0	22	21
Cadmium	0.005	0	0	22	21
Chromium	0.1	0	0	22	21
Cyanide	0.2	0	0	24	22
Fluoride	2	3	1	24	23
Mercury	0.002	0	0	27	24
Nickel	0.1	0	0	22	21
Nitrate	10 (as Nitrogen)	67	36	443	381
Nitrite	1 (as Nitrogen)	0	0	441	378
Selenium	0.05	0	0	23	22
Thallium, Total	0.002	0	0	22	21
Subtotal		84	45	1215	425

	MCL (mg/L)	MCL Violations		Significant Monitoring/Reporting Violations	
		Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
RADIONUCLIDE CONTAMINANTS					
Radium 226	-----	0	0	27	17
Radium 228	-----	0	0	27	17
Combined Radium (-226 & -228)	5 pCi/L	8	4	0	0
Combined Uranium	30 µg/L	0	0	18	13
Gross Alpha, Excl. Radon & U	15 pCi/L	2	1	29	16
Gross Beta & Photo Emitters	4 mrem/yr	0	0	1	1
38-Strontium-90	8 pCi/L	0	0	0	0
Tritium	20,000 pCi/L	0	0	0	0
Subtotal		10	4	102	28
TOTAL CHEMICAL CONTAMINANTS		101	53	7834	624

Figure 6A.

Pennsylvania—SUMMARY OF VIOLATIONS
Revised Total Coliform Rule
MCL, MR and Treatment Techniques (TT) Violations
Annual Compliance Report -- January 1, 2020 to December 31, 2020

Revised Total Coliform Rule	MCL Violations		Monitoring/Reporting Violations		Treatment Technique Violations	
	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
	72	57	2699	1250	386	285

Figure 6B.

Pennsylvania—SUMMARY OF VIOLATIONS
Surface Water Treatment/IESWTR/LT2SWTR and Lead and Copper Rules
Treatment Techniques (TT) and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2020 to December 31, 2020

	Treatment Technique Violations		Significant Monitoring/Reporting Violations	
	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
SURFACE WATER TREATMENT RULE/IESWTR/LT2SWTR				
Filtered systems				
Monitoring, routine/repeat			321	78
Treatment techniques	40	16		
Unfiltered systems				
Monitoring, routine/repeat			13	5
Treatment techniques	0	0		
Subtotal	40	16	334	83
LEAD AND COPPER RULE				
Initial lead and copper tap M/R			11	11
Follow-up or routine lead and copper tap M/R			132	126
Treatment installation/technique	23	23		
Subtotal	23	23	143	137

Figure 6C.

Pennsylvania—SUMMARY OF VIOLATIONS
Ground Water Rule
Treatment Techniques (TT) and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2020 to December 31, 2020

	Treatment Technique Violations		Significant Monitoring/Reporting Violations	
	Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
GROUNDWATER RULE	172	82	523	266

Figure 6D.

**Pennsylvania—SUMMARY OF VIOLATIONS
Disinfectants and Disinfection Byproducts
MCL, MRDL, TT and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2020 to December 31, 2020**

	MCL (mg/L)	Type	MCL, MRDL and TT Violations		Significant Monitoring/Reporting Violations	
			Number of Violations	Number of Systems With Violations	Number of Violations	Number of Systems With Violations
DISINFECTANTS/ DISINFECTION BYPRODUCTS CONTAMINANTS						
Bromate	0.01	MCL	3	1	45	20
Chloramine	4.0	TT	0	0	0	0
Chlorine	4.0	TT	0	0	244	144
Chlorine Dioxide	0.8	MCL	0	0	3	3
Chlorite	1.0	MCL	0	0	6	4
Total Alkalinity		TT	0	0	49	26
Total Organic Carbon		TT	4	4	42	24
Haloacetic Acids (Five)	0.06	MCL	78	23	117	109
Trihalomethanes	0.08	MCL	25	10	126	118
Subtotal		MCL	106	38	632	301
		TT	4	4		

Figure 7.

**Pennsylvania—SUMMARY OF VIOLATIONS
MCL, MRDL, Treatment Technique, PN, and Significant Monitoring/Reporting
Annual Compliance Report -- January 1, 2020 to December 31, 2020**

Number of Violations	Number of Systems
19046	2920

NOTE: Includes 341 consumer confidence reporting violations involving 246 community water systems and 3,717 Public Notification violations.

Violations Summary by Violation Type and PWS Type and Size

Figure 8.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
REVISED TOTAL COLIFORM**

	M/R	MCL	PN
SMALL	158	3	95
MEDIUM	33	1	7
LARGE		0	0
TOTAL	191	4	102

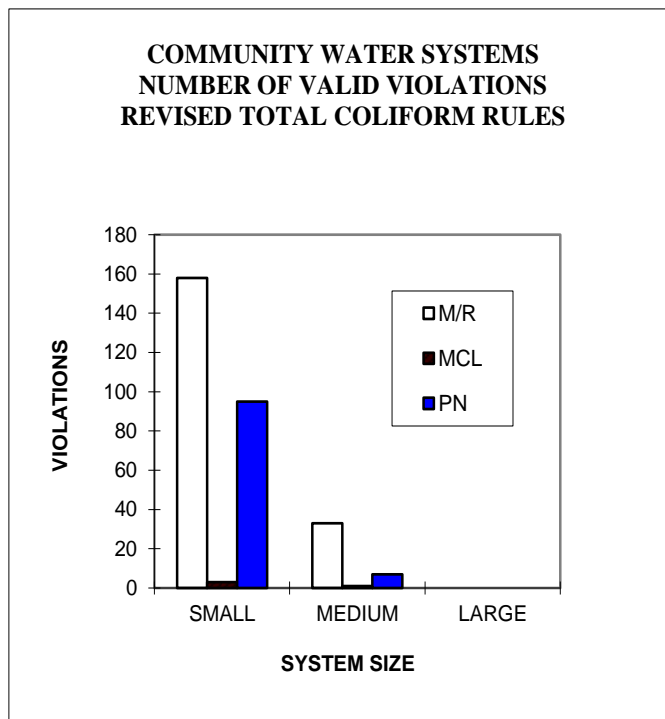


Figure 9.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
CHEMICALS - RADIONUCLIDES**

	M/R	MCL	PN
SMALL	3,109	20	864
MEDIUM	1,314	1	26
LARGE	56	0	0
TOTAL	4,479	21	890

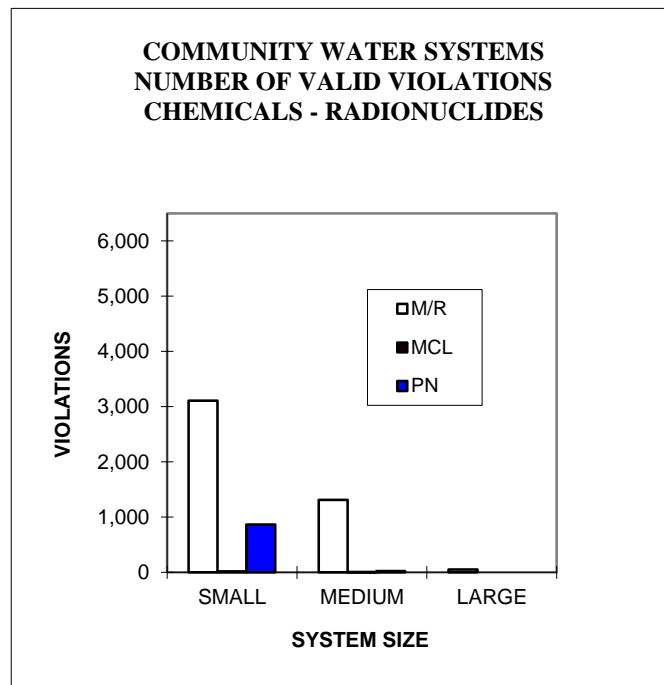


Figure 10.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
FILTER RULE**

	M/R	TT	PN
SMALL	196	23	10
MEDIUM	80	3	10
LARGE	1	0	0
TOTAL	277	26	20

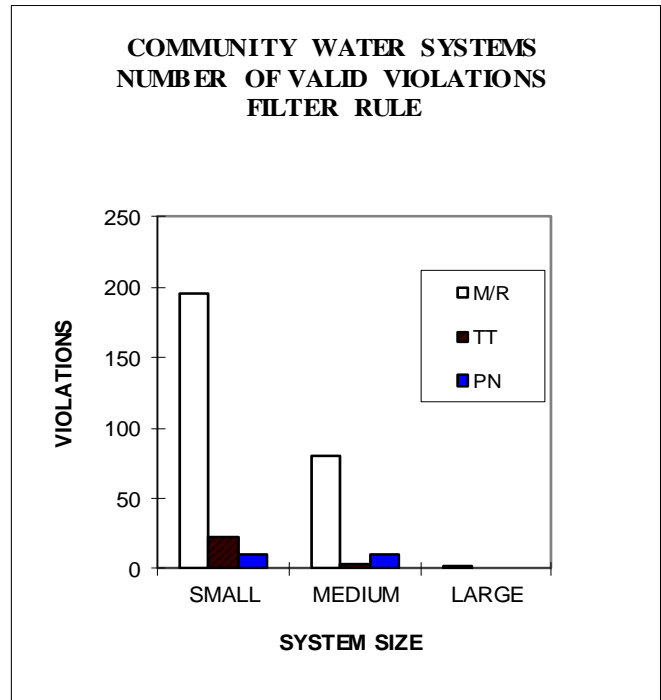


Figure 11.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
LEAD AND COPPER RULE**

	M/R	TT	PN
SMALL	74	5	6
MEDIUM	2	0	0
LARGE	0	0	0
TOTAL	76	5	6

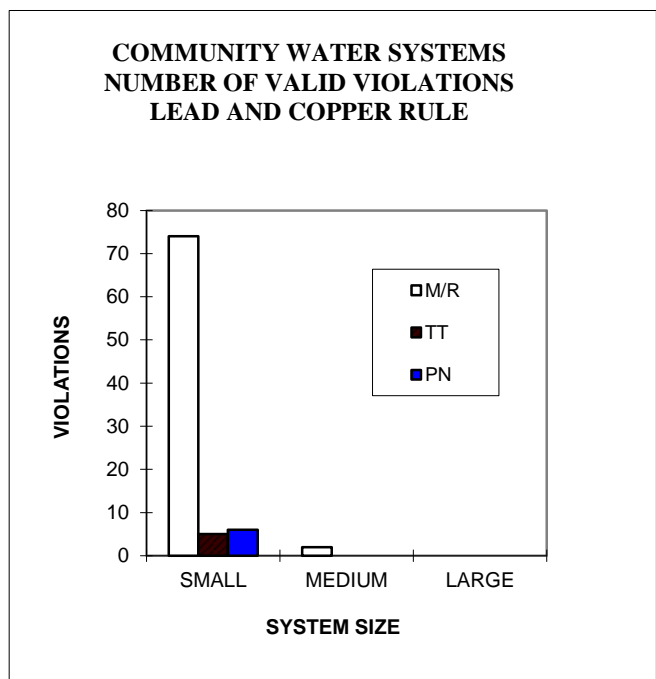


Figure 12.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
GROUND WATER RULE**

	M/R	TT	PN
SMALL	379	153	183
MEDIUM	26	3	3
LARGE	0	0	0
TOTAL	405	156	186

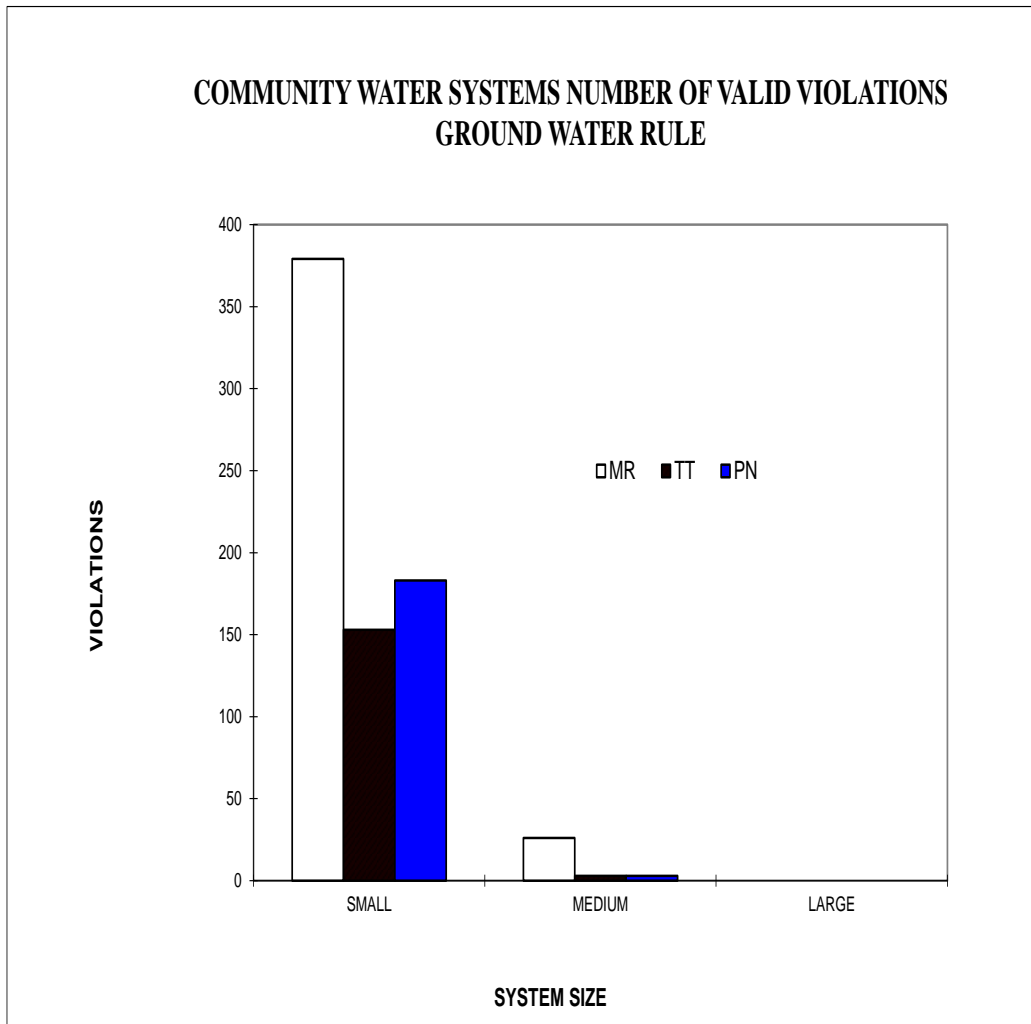


Figure 13.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
DISINFECTANTS/BYPRODUCTS**

	M/R	MCL	MRDL	T/T	PN
SMALL	355	63	0	1	567
MEDIUM	112	18	0	1	34
LARGE	0	0	0	1	0
TOTAL	467	81	0	3	601

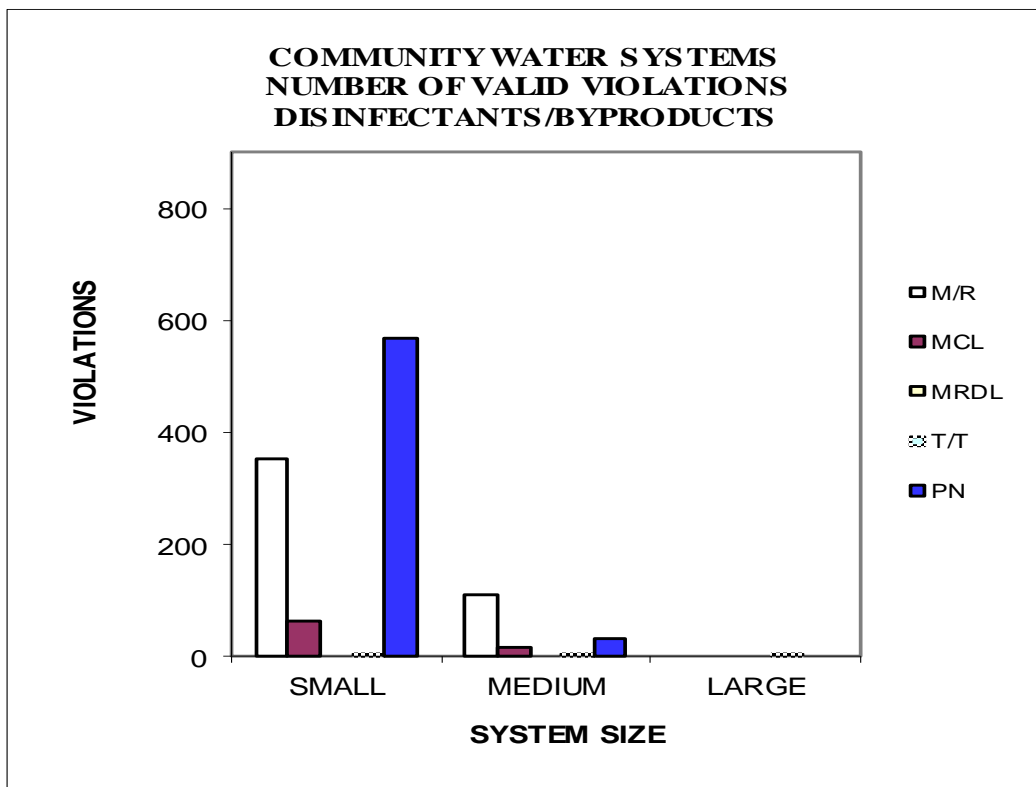


Figure 14.

**COMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS
CONSUMER CONFIDENCE REPORTS**

	M/R
SMALL	275
MEDIUM	25
LARGE	0
TOTAL	300

Violations for missing reports.

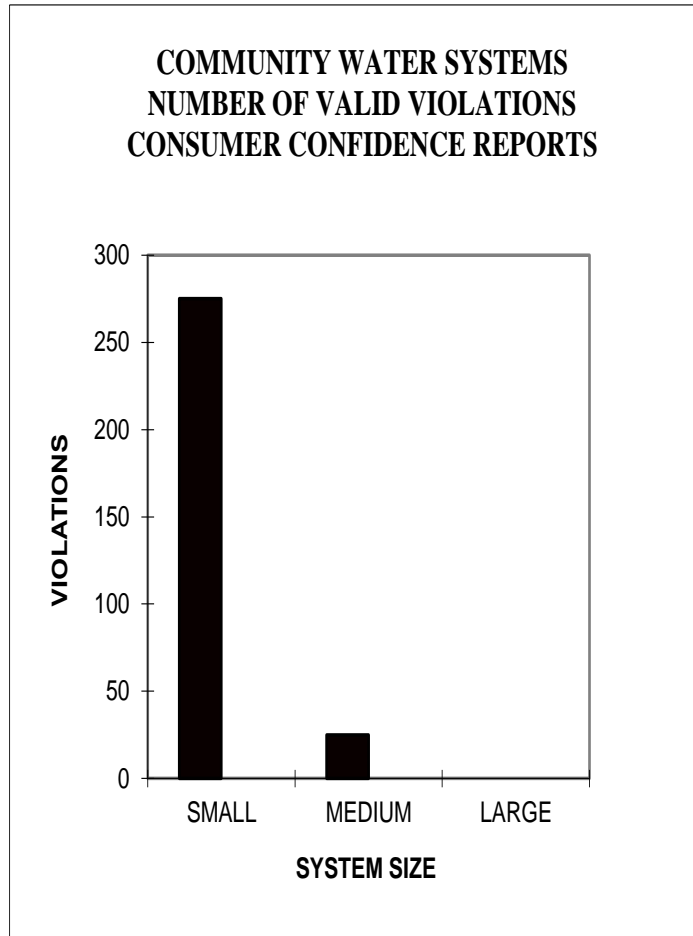


Figure 15.

**NONTRANSIENT NONCOMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS**

	M/R	MCL	MRDL	TT	PN
RTCR	174	3	0	29	83
CHEM/RAD	1,489	33	0	0	787
GWR	13	0	0	0	9
FILTER	23	0	0	1	1
LCR	67	0	0	18	13
DBPR	120	22	0	1	272
TOTAL	1,886	58	0	49	1,165

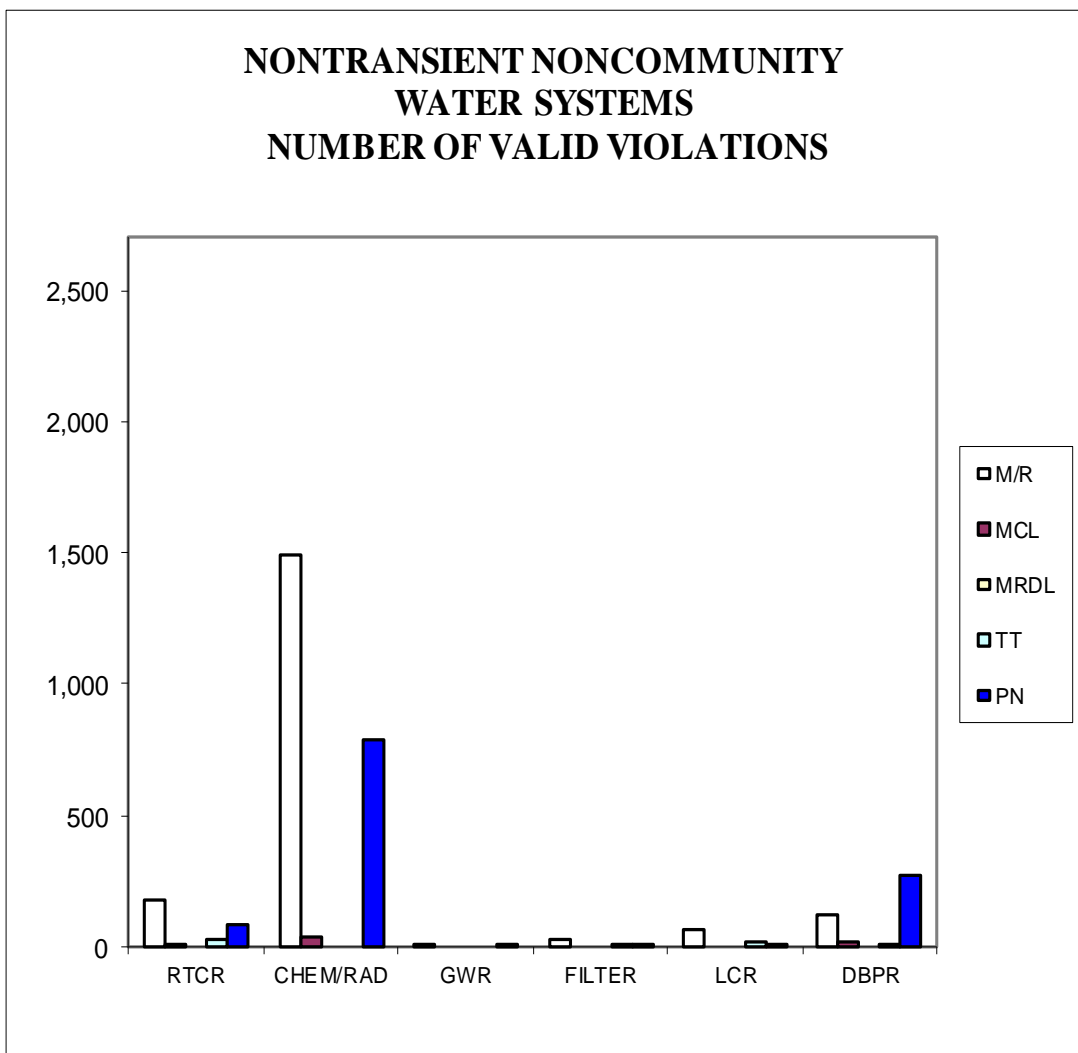


Figure 16.

**TRANSIENT NONCOMMUNITY WATER SYSTEMS
NUMBER OF VALID VIOLATIONS**

	M/R	MCL	MRDL	TT	PN
RTCR	1,761	60	0	324	1,127
CHEM/RAD	654	47	0	0	201
GWR	105	0	0	16	115
FILTER	34	0	0	13	4
LCR	0	0	0	0	0
DBPR	0	2	0	0	69
TOTAL	2,554	109	0	353	1,516

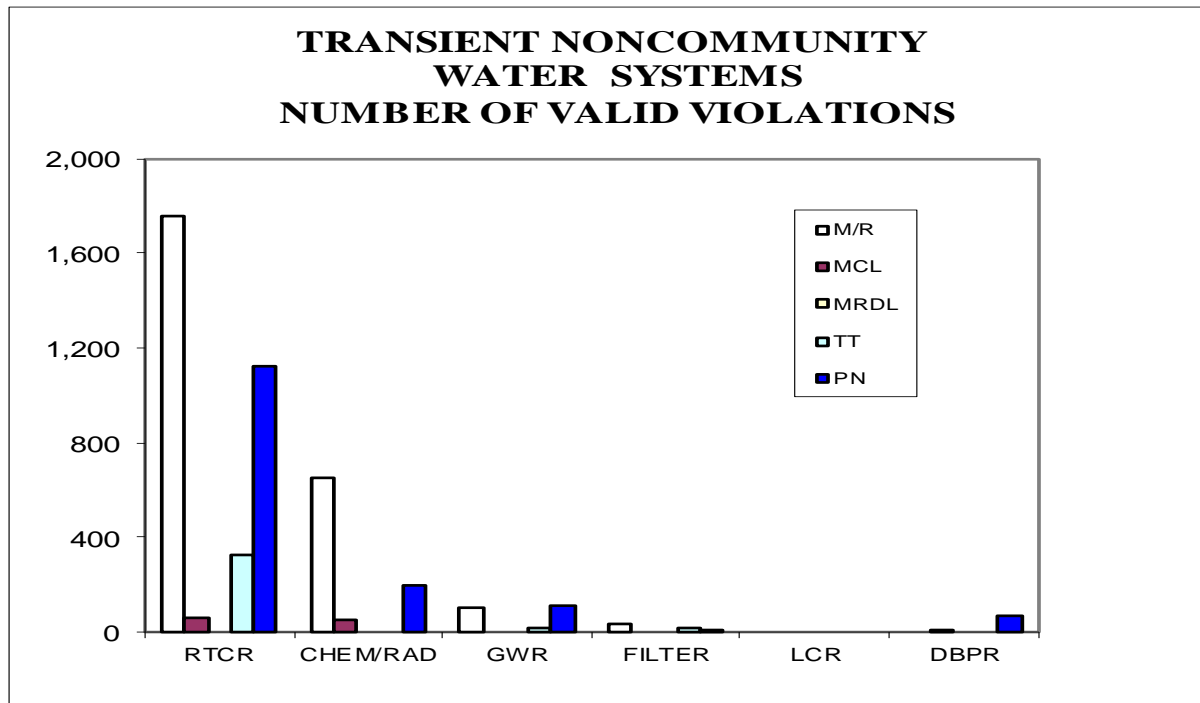
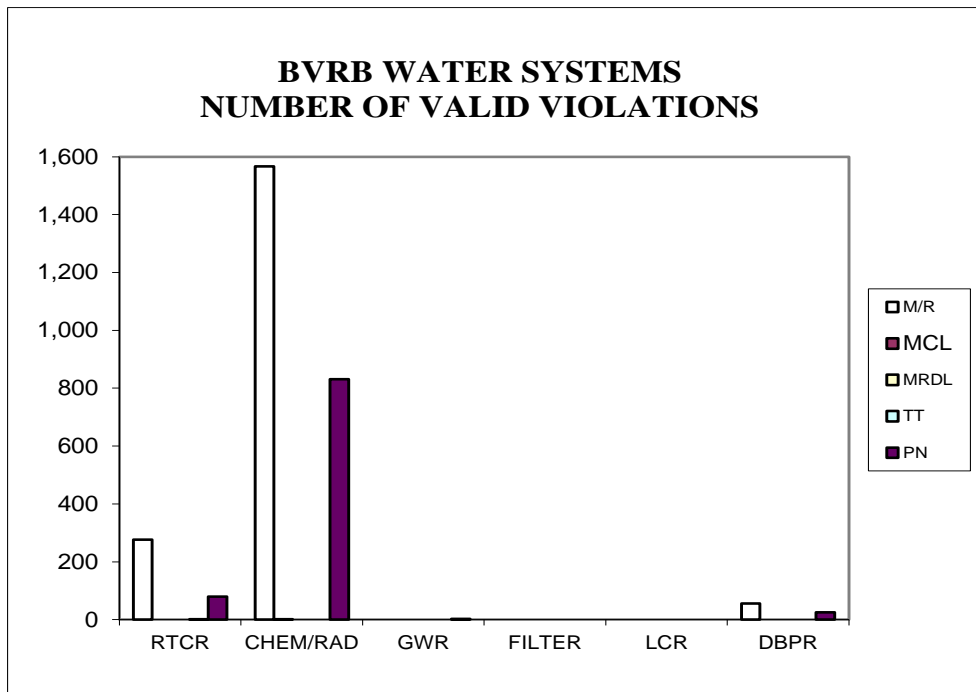


Figure 17.

**BOTTLED, VENDED, RETAIL, & BULK (BVRB) WATER SYSTEMS
NUMBER OF VALID VIOLATIONS**

	M/R	MCL	MRDL	TT	PN
RTCR	276	0	0	1	80
CHEM/RAD	1,567	1	0	0	831
GWR	0	0	0	0	3
FILTER	0	0	0	0	0
LCR	0	0	0	0	0
DBPR	56	0	0	0	25
TOTAL	1,899	1	0	1	939



Compliance Rates

A public water system is counted as being in compliance if there were no violations during the year. A public water system is counted as out of compliance if there was any time period within the year when there was an outstanding violation. Being counted as out of compliance does not imply that the violation spanned the entire year.

Figure 18.

	SYSTEMS	POPULATION
SMALL	61.9%	59.9%
MEDIUM	56.9%	59.0%
LARGE	85.3%	79.5%

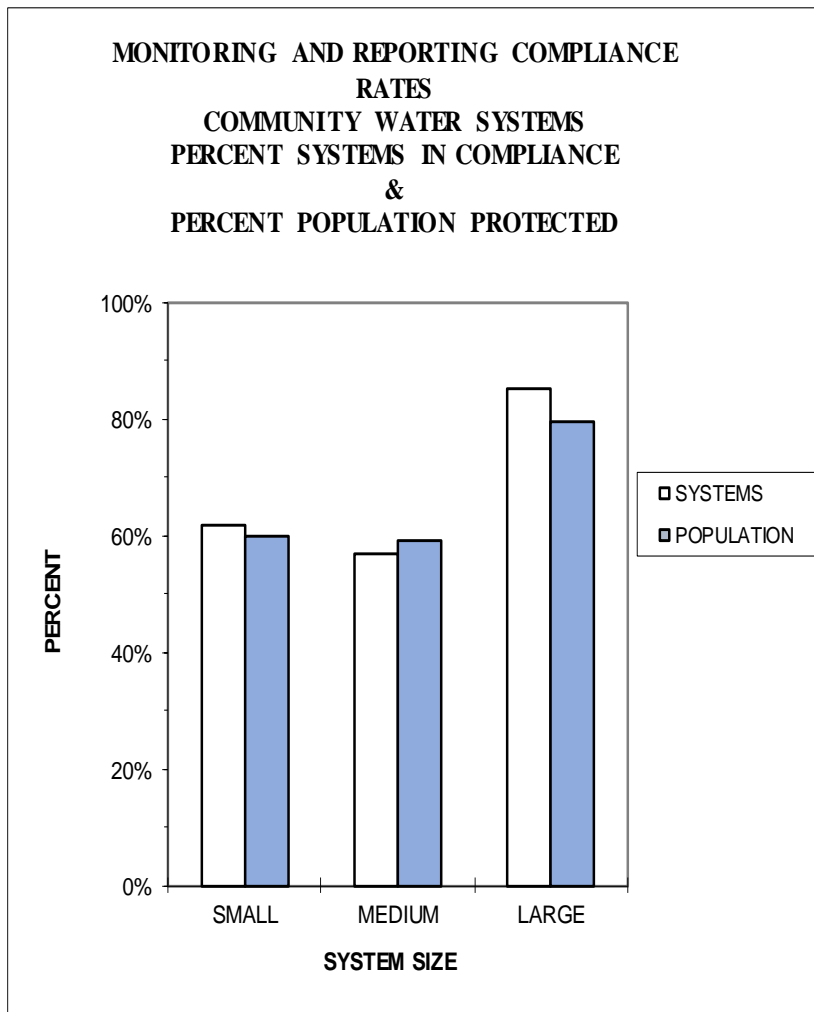


Figure 19.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE
FOR MAXIMUM CONTAMINANT LEVELS**

	SYSTEMS	POPULATION
SMALL	98.0%	97.2%
MEDIUM	96.3%	96.5%
LARGE	100.0%	100.0%

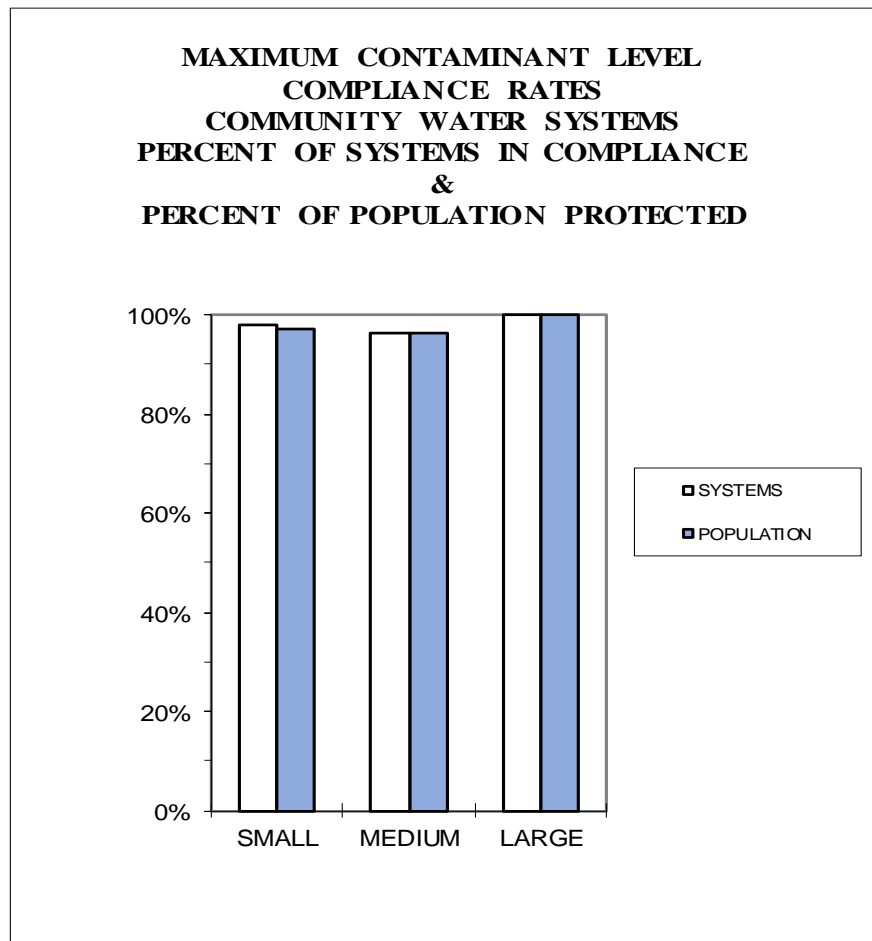


Figure 20.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE
TREATMENT TECHNIQUES**

	SYSTEMS	POPULATION
SMALL	94.0%	94.4%
MEDIUM	96.7%	96.5%
LARGE	97.1%	99.0%

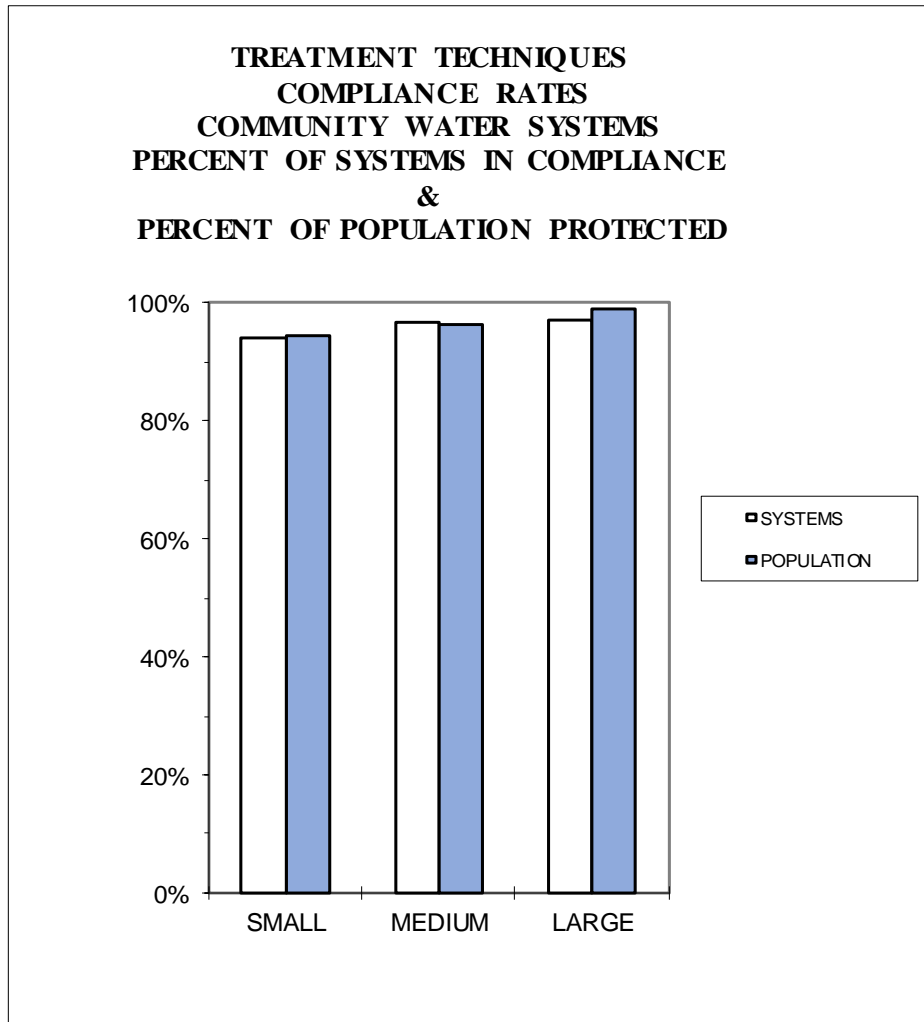


Figure 21.

**COMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE
MAXIMUM RESIDUAL DISINFECTANT LEVELS**

	SYSTEMS	POPULATION
SMALL	100.0%	100.0%
MEDIUM	100.0%	100.0%
LARGE	100.0%	100.0%

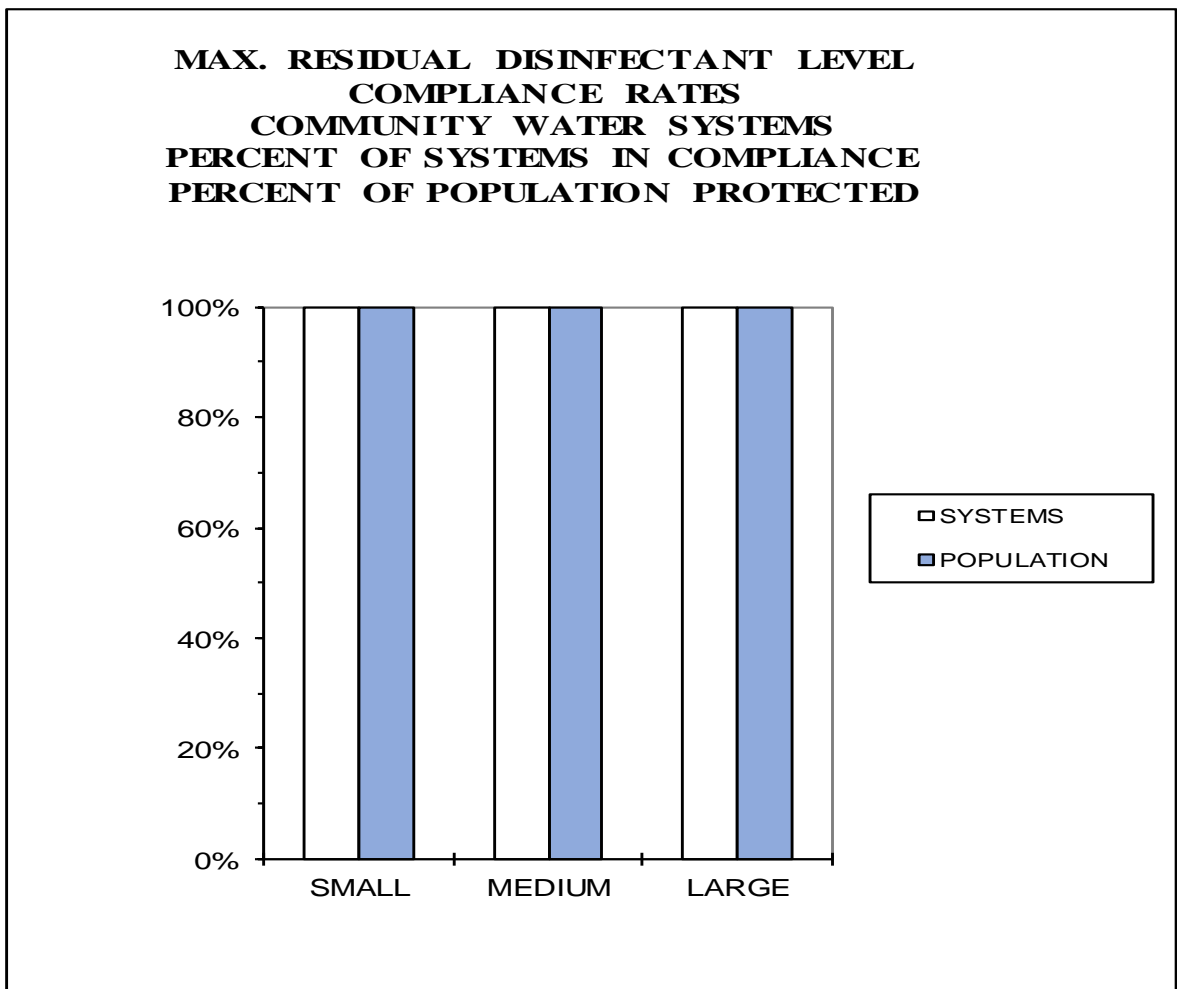


Figure 22.

**NONTRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	73.9%	67.6%
MCL	98.3%	99.0%
MRDL	100.0%	100.0%
TT	96.7%	97.2%
PN	86.3%	87.8%

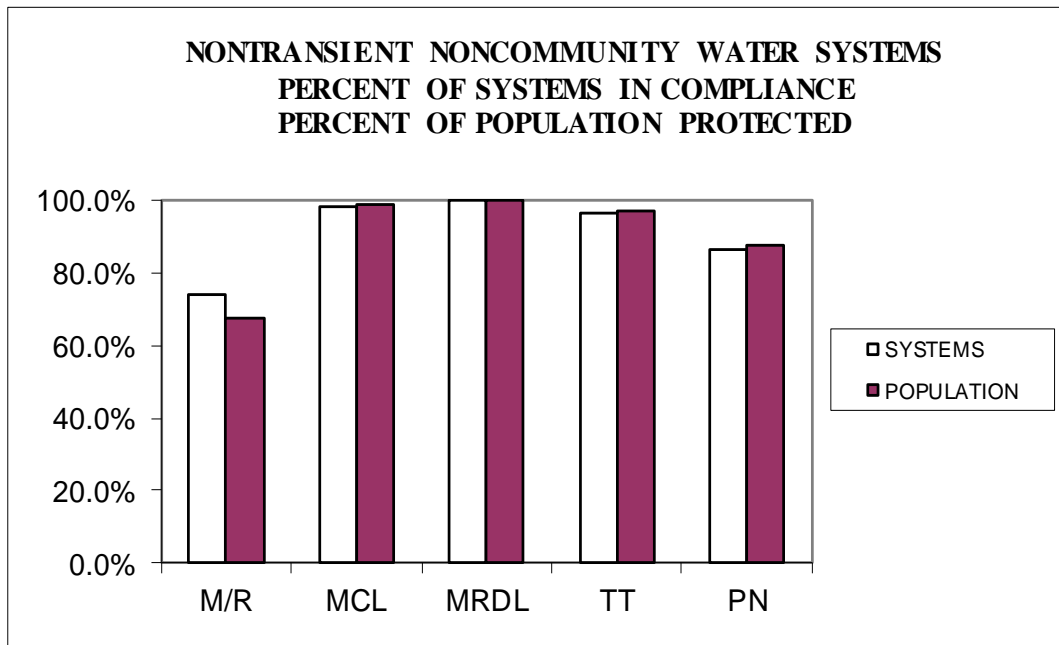


Figure 23.

**TRANSIENT NONCOMMUNITY WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	78.2%	78.4%
MCL	98.5%	98.8%
MRDL	100.0%	100.0%
TT	95.1%	94.2%
PN	85.9%	85.5%

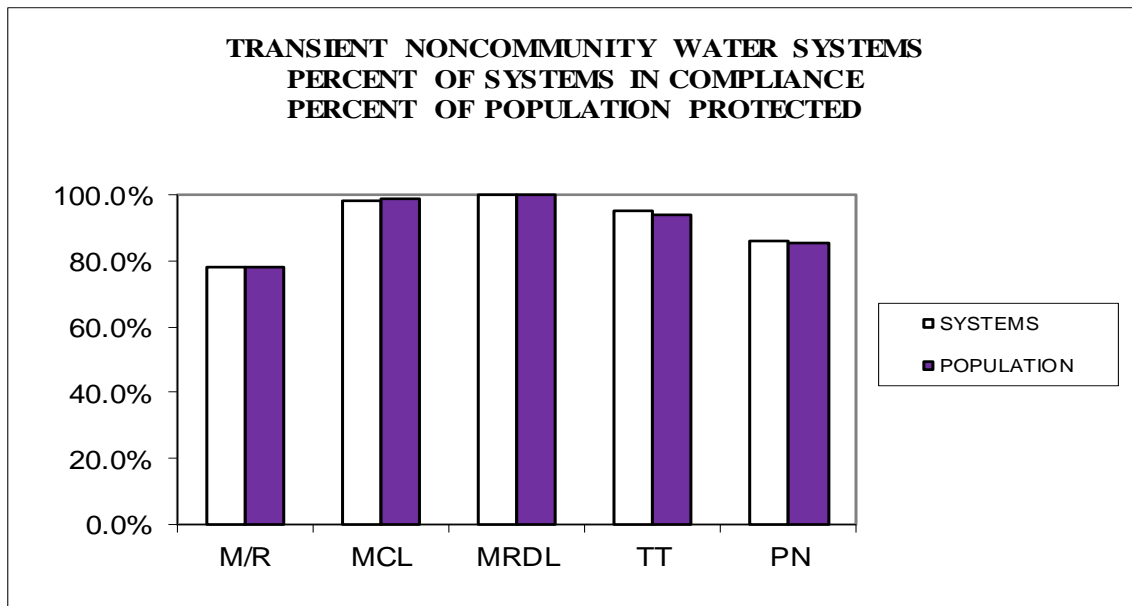


Figure 24.

**BVRB WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	47.9%	23.9%
MCL	99.4%	98.5%
MRDL	100.0%	100.0%
TT	94.5%	96.8%
PN	89.6%	98.3%

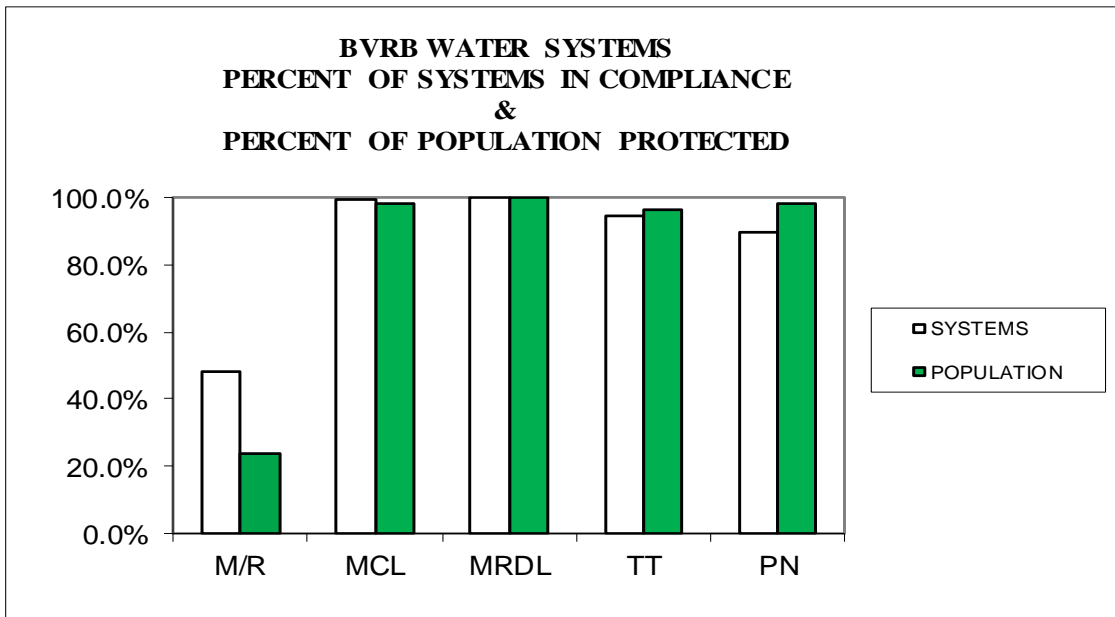
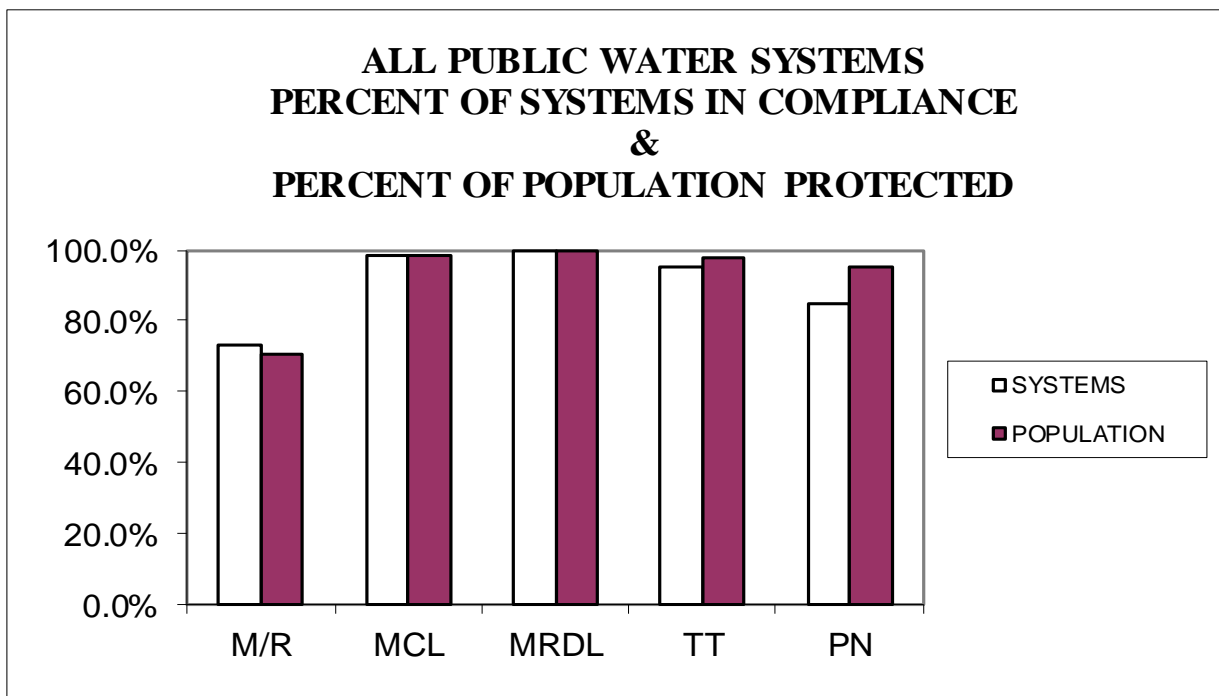


Figure 25.

**ALL PUBLIC WATER SYSTEMS
PERCENT IN COMPLIANCE**

	SYSTEMS	POPULATION
M/R	73.1%	70.4%
MCL	98.3%	98.6%
MRDL	100.0%	100.0%
TT	95.2%	97.6%
PN	85.0%	94.9%



3. Discussion and Conclusions

Since the Safe Drinking Water Act was reauthorized in 1996, federal and state regulations have undergone a rapid evolution, with 20 new regulations being promulgated. As a result, public health standards have become more protective. However, the cumulative effect of the new regulations has led to a steep learning curve and a severe shortfall in resources, and many water suppliers and state agencies are struggling to keep pace. Pennsylvania was able to address the shortfall in staffing levels with promulgation of the General Update and Fees Rule in 2018. As a result of new annual fees and increased permit fees, the Department was able to hire 33 additional staff.

In 2020, a large majority of Pennsylvanians received water from public water systems that reported no violations of health-based standards. The trend in compliance rates over the last thirteen years indicates a consistently high compliance rate for health-based standards. The compliance rate for meeting all monitoring and reporting requirements was on the rise, following a low of 70% in 2004. However, in 2016, the compliance rate fell again due in part to the new RTCR. In 2020, 73.1% of all public water systems were in compliance with monitoring and reporting requirements, and 98% of all public water systems were in compliance with the health-based standards. Refer to Figure 26 and 27 for more details about compliance trends.

Figure 26. Compliance Trends – Percent of All Public Water Systems in Compliance

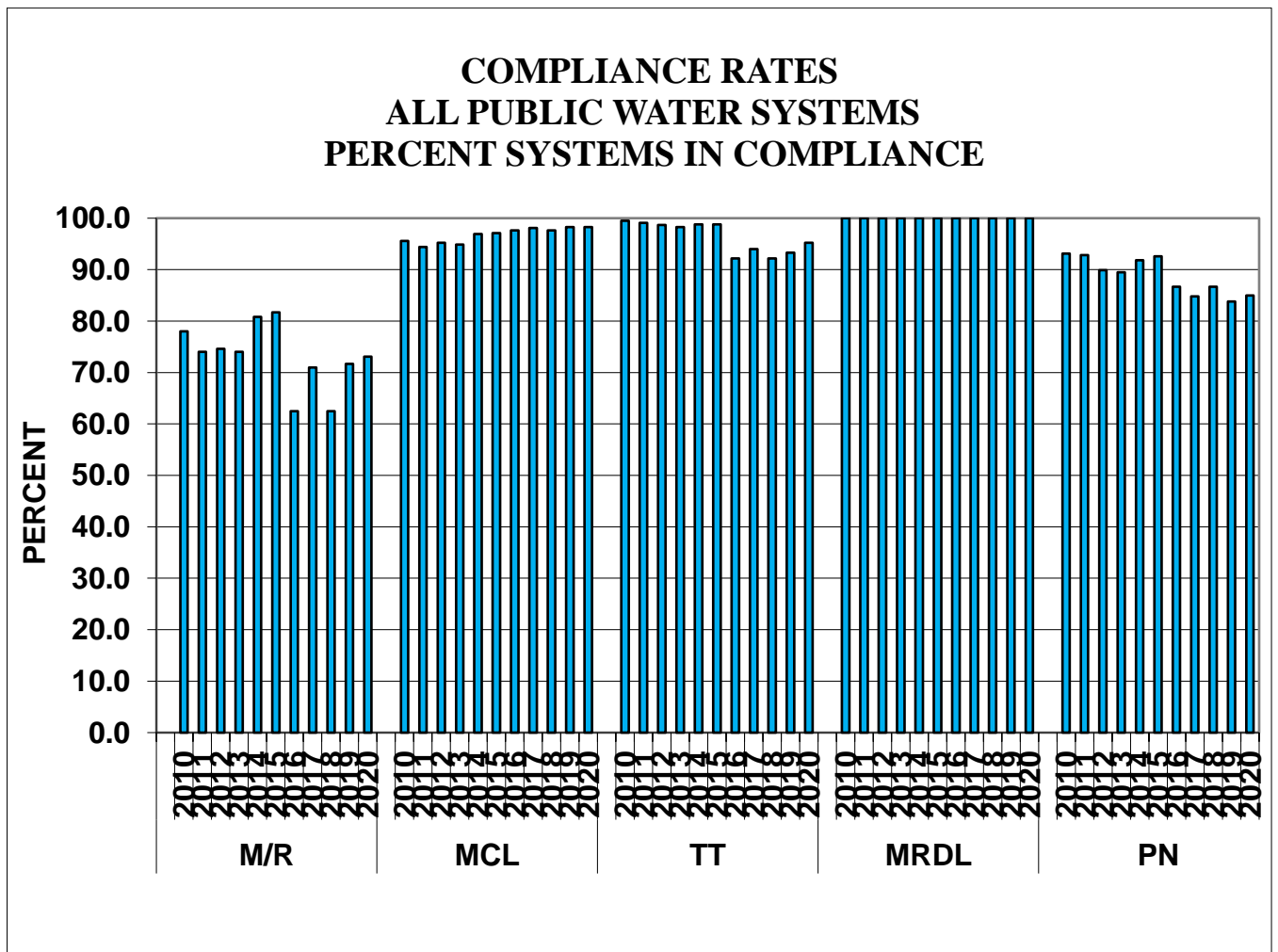
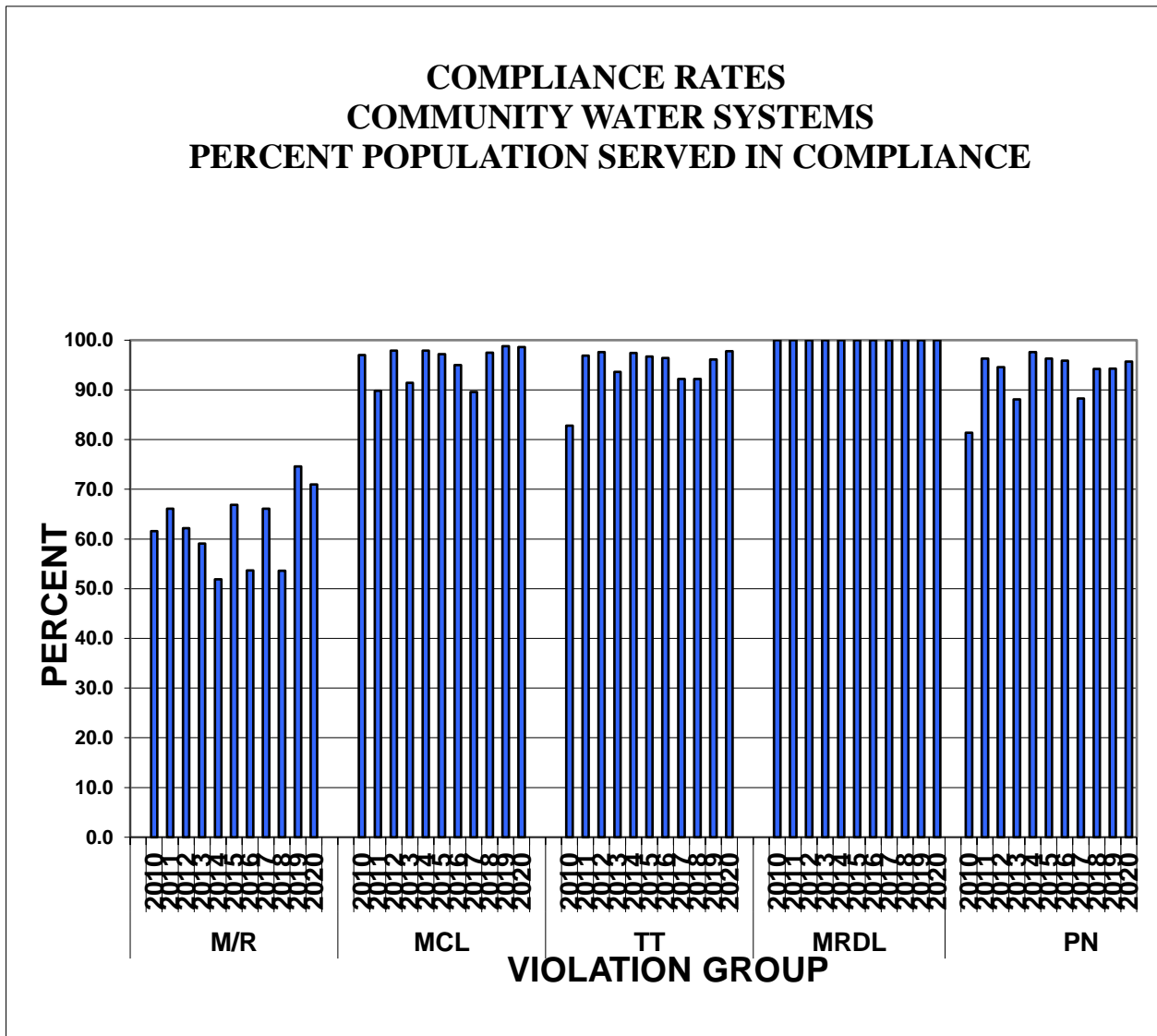


Figure 27. Compliance Trends – Percent of Population Served by Community Water Systems in Compliance



In 2020, public water systems continued to meet the challenges from existing regulations, while also complying with newer requirements for the Disinfection Requirements Rule (DRR) and the General Update and Fees Rule.

Water systems continued efforts to assess the potential threats to and protect their infrastructure from acts of terrorism in 2020. DEP implemented several outreach and training events to help water suppliers prevent attacks against their systems. Additionally, DEP maintains a rapid notification system in the event of planned or actual attacks against water systems.

In 2020, DEP staff were required to follow statewide stay-at-home orders and health and safety restrictions that impacted on-site field and in-office activity in response to the COVID 19 Pandemic. While working remotely, staff remained in contact with public water systems and conducted oversight through the use of remote and administrative inspections. Remote inspections were made possible through the use of mobile inspection equipment (i.e., DEP iPADS and video conferencing capability) in addition to their desktop

computers. Under approved health and safety plans, DEP staff were also able to conduct on-site inspections, evaluations and permitting field work when necessary to address imminent threat and high priority situations.

As compliance is a long-term effort, DEP staff members continue to work with each and every violator to address violations as they occur. In most instances, these efforts result in a voluntary return to compliance. However, when those efforts fail, progressive levels of compliance and enforcement are used.

DEP will continue to develop programs to assist water suppliers in protecting and managing their sources of supply; building technical, managerial, and financial capability; and training and certifying personnel responsible for the day-to-day operations of their drinking water systems. Congress enacted sweeping amendments to the federal Safe Drinking Water Act that will lend considerable support to DEP's efforts. In addition to establishing a state revolving loan fund for water system improvements, Congress established technical and financial assistance programs to states and suppliers for source water protection, capacity development, and training and outreach activities. These tools will enable DEP to assist Pennsylvania's public water systems in delivering a safe and adequate supply of drinking water to their consumers.

Where To Go For Additional Information

Copies of this report, an Appendix listing the public water systems having MCL, MRDL or treatment technique violations during 2020, and additional information about the Pennsylvania Safe Drinking Water Program are available. Please contact DEP at:

Department of Environmental Protection

Bureau of Safe Drinking Water

P.O. Box 8467, 10th Floor RCSOB

Harrisburg, PA 17105-8467

Phone: 717-772-4018

Web site: <https://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/default.aspx>