North Carolina's Annual Public Water Systems Compliance Report For the Calendar Year 2012

The Drinking Water Program: An Overview

The 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 the 1986 Amendments, 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) and the Maximum Residual Disinfectant Levels (MRDLs). For some regulations, the EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in water. The EPA also regulates how often public water systems (PWSs) monitor their water for contaminants and report the monitoring results to the states or the EPA. Generally, the larger the population served by a water system, the more frequent the monitoring and reporting (M/R) requirements. In addition, the EPA requires PWSs to monitor for unregulated contaminants to provide data for future regulatory development. Finally, the EPA requires PWSs to notify consumers when they have violated these regulations. The 1996 Amendments to the SDWA require consumer notification to 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, and the Commonwealth of the Northern Mariana Islands.

The SDWA allows states, tribes 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 federal 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. Of the 56 states and territories, all but Wyoming and the District of Columbia have primacy. The EPA regional offices administer the PWSS Programs within these two jurisdictions.

The 1986 SDWA Amendments gave Indian tribes the right to apply for and receive primacy. EPA currently administers PWSS Programs on all Indian lands except the Navajo Nation, which was granted primacy in late 2000.

Annual State PWSs Compliance Report [Annual Compliance Report (ACR)]

Each quarter, primacy states submit data to the 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, the incidence of Maximum Contaminant Level, Maximum Residual Disinfectant Level, monitoring, and treatment technique violations; and information on enforcement activity related to these violations. Section 1414(c)(3) of the Safe Drinking Water Act requires states to provide EPA with an annual report of violations of the primary drinking water standards. This report provides the numbers of violations in each of six categories: MCLs, MRDLs, treatment techniques, variances and exemptions, significant monitoring violations, and significant consumer notification violations. The EPA regional offices report the information for Wyoming, the District of Columbia, and all Indian lands but the Navajo Nation. EPA regional offices also report federal enforcement actions taken. Data retrieved from SDWIS/FED form the basis of this report.

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: community (such as towns), non-transient non-community (such as schools or factories), or transient non-community systems (such as churches, rest stops or parks). For this report, when the acronym "PWS" is used, it means systems of all types, unless specified in greater detail.

Maximum Contaminant Level

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).

Maximum Residual Disinfectant Level

The EPA sets national limits on residual disinfectant levels in drinking water to reduce the risk of exposure to disinfectant byproducts formed when public water systems add chemical disinfectants for either primary or residual treatment. These limits are known as Maximum Residual Disinfectant Levels (MRDLs).

Treatment Techniques

For some regulations, the EPA establishes treatment techniques (TTs) in lieu of an MCL to control unacceptable levels of certain contaminants. For example, treatment techniques have been established for viruses, some bacteria, and turbidity.

Variances and Exemptions

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. The variance shall be reviewed not less than every 5 years to determine if the system remains eligible for the variance.

A primacy state can grant an exemption temporarily relieving a PWS of its obligation to comply with an MCL or 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. The state will require the PWS to comply with the MCL or treatment technique as expeditiously as practicable, but not later than 3 years after the otherwise applicable compliance date.

Monitoring

A PWS is required to monitor and verify that the levels of contaminants present in the water do not exceed the MCL or MRDL. If a PWS fails to have its water tested as required or fails to report test results correctly to the primacy agency, a monitoring violation occurs.

Significant Monitoring Violations

For this report, significant monitoring violations are generally defined as any significant monitoring violation that occurred during the calendar year of the report. A significant monitoring violation, with rare exceptions, occurs when no samples were taken or no results were reported during a compliance period.

Consumer Notification

Every community water system is required to deliver to its customers a brief annual water quality report. This report is to include some educational material, and will provide information on the source water, the levels of any detected contaminants, and compliance with drinking water regulations.

Significant Consumer Notification Violations

For this report, a significant consumer notification violation occurred if a community water system completely failed to provide its customers the required annual water quality report.

OBTAINING A COPY OF THE 2012 PUBLIC WATER SYSTEMS COMPLIANCE REPORT (ACR)

As required by the Safe Drinking Water Act, the State of North Carolina has made the 2012 Public Water Systems Compliance Report available to the public. Interested individuals can obtain a copy of the 2012 ACR for North Carolina from our website at http://www.deh.enr.state.nc.us/pws/reportspubs.htm or they can contact Hornlean Chen by phone at 919-707-9068, by email at Hornlean.Chen@ncdenr.gov, or by mail at NCDENR, Public Water Supply Section, 1634 Mail Service Center, Raleigh, NC 27699-1634

Table of Violation Summaries for 2012

Code	Synthetic Organic Contaminants (SOCs)	MCL (mg/L)	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
2931	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0	0	0	6	2	4
	2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver
2110	2,4,5-TP (Silvex)	0.05	0	0	0	6	2	4
2105	2,4-D	0.07	0	0	0	7	2	5
2051	Alachlor (LASSO)	0.002	0	0	0	6	2	4
2050	Atrazine	0.003	0	0	0	7	2	5
2306	Benzo(a)pyrene	0.0002	0	0	0	6	2	4

Code	Synthetic Organic Contaminants (SOCs)	MCL (mg/L)	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
2046	Carbofuran	0.04	0	0	0	6	2	4
2959	Chlordane	0.002	0	0	0	10	2	5
2031	Dalapon	0.2	0	0	0	6	2	4
2035	Di(2-ethylhexyl)adipate	0.4	0	0	0	9	2	6
2039	Di(2-ethylhexyl)phthalate	0.006	0	0	0	8	3	6
2041	Dinoseb	0.007	0	0	0	6	2	4
	Diquat	0.02	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver
	Endothall	0.1	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver
2005	Endrin	0.002	0	0	0	6	2	4
2946	Ethylene dibromide (EDB)	0.00005	0	0	0	6	2	4
	Glyphosate	0.7	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver	State-wide waiver
2065	Heptachlor	0.0004	0	0	0	6	2	4
2067	Heptachlor epoxide	0.0002	0	0	0	12	2	7
2274	Hexachlorobenzene	0.001	0	0	0	6	2	4
2042	Hexachlorocyclopentadiene	0.05	0	0	0	6	3	4
2010	Lindane (BHC-Gamma)	0.0002	0	0	0	7	2	5
2015	Methoxychlor	0.04	0	0	0	6	2	4
2383	Total polychlorinated biphenyls (PCBs)	0.0005	0	0	0	7	2	5
2326	Pentachlorophenol	0.001	0	0	0	6	2	4
2020	Toxaphene	0.003	0	0	0	6	2	4
2036	Oxamyl (Vydate)	0.2	0	0	0	6	2	4
2040	Pichloram	0.5	0	0	0	6	2	4
2037	Simazine	0.004	0	0	0	8	2	6
	SUBTOTAL		0	0	0	177	54	118

Code	Volatile Organic Contaminants (VOCs)	MCL (mg/L)	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
2981	1,1,1-Tricholorethane	0.2	0	0	0	15	13	14
2977	1,1-Dichloroethylene	0.007	4	0	1	15	13	14
2985	1,1,2-Trichloroethane	.005	0	0	0	15	13	14
2378	1,2,4-Trichlorobenzene	.07	0	0	0	15	13	14
2980	1,2-Dichloroethane	0.005	0	0	0	15	13	14
2983	1,2-Dichloropropane	0.005	0	0	0	15	13	14
2990	Benzene	0.005	0	0	0	15	13	14
2982	Carbon tetrachloride	0.005	0	0	0	15	13	14
2380	Cis-1,2-Dichloroethylene	0.07	0	0	0	15	13	14
2964	Dichloromethane	0.005	3	0	1	15	13	14
2992	Ethylbenzene	0.7	0	0	0	15	13	14
2989	Monochlorobenzene	0.1	0	0	0	15	13	14
2968	o-Dichlorobenzene	0.6	0	0	0	15	13	14
2969	para-Dichlorobenzene	0.075	0	0	0	15	13	14
2987	Tetrachloroethylene	0.005	0	0	0	15	13	14
2984	Trichloroethylene	0.005	0	2	0	15	13	14
2996	Styrene	0.1	0	0	0	15	13	14
2991	Toluene	1	0	0	0	15	13	14
2979	Trans-1,2-Dichloroethylene	0.1	0	0	0	15	13	14
2955	Xylenes (total)	10	0	0	0	15	13	14
2976	Vinyl chloride	0.002	0	0	0	15	13	14
	SUBTOTAL		7	2	2	315	273	294

Code	Inorganic Contaminants	MCL (mg/L)	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
1074	Antimony	0.006	0	0	0	0	0	0
1005	Arsenic	0.010*	0	0	0	0	0	0
1094	Asbestos	7 million fibers/L >10 µm	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	Chrominum	0.1	0	0	0	0	0	0
1024	Cyanide (as free cyanide)	0.2	0	0	0	0	0	0
1025	Fluoride	4.0	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	10 (as Nitrogen)	5	0	5	258	7	242
1041	Nitrite	1 (as Nitrogen)	0	0	0	41	0	41
1045	Selenium	0.05	0	0	0	0	0	0
1085	Thallium	0.002	0	0	0	0	0	0
	SUBTOTAL		5	0	5	299	7	283

*NC lowered the Arsenic Maximum Contaminant Level (MCL) to 0.010 mg/L in the year 2002.

Code	Radionuclides	MCL	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
4000	Gross alpha	15 pCi/L	3	0	1	31	0	11
4006	Uranium	20.1 pCi/L	8	0	3	30	0	10
4010	Radium-226 and radium-228	5 pCi/L	14	0	6	31	0	12
4100	Gross beta	50 pCi/L (screening level)	0	0	0	0	0	0

Code	Radionuclides	MCL	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
	SUBTOTAL		25	0	10	92	0	33

Violation Type	Total Coliform Rule	MCL	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
21	Acute MCL Violation	Presence	0	11	0			
22	Non-acute MCL violation	Presence	45	208	39			
23	Major routine monitoring					621	470	319
25	Major repeat monitoring					17	15	16
	SUBTOTAL		45	219	39	638	485	335

Violation Type	Groundwater Rule	MCL	Treatment Techniques			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
34/3014	Source monitoring GWR					43	0	42
41/0700	Failure maintain microbial treatment GWR		0	0	0			
73/0700	Failure to notify other system					1	0	1
	SUBTOTAL		0	0	0	44	0	43

Violation Type	Surface Water Treatment Rule (SWTR)	MCL	Treatment Techniques			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
38/0300	Routine major monitoring					0	0	0
43/0300	Single combined filter effluent		0	1	0			
44/0300	Monthly combined filter effluent		0	1	0			
	SUBTOTAL		0	2	0	0	0	0

Violation Type	Lead and Copper Rule	MCL (mg/L)	Treatment Techniques			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
51	Initial lead and copper tap M/R					8	0	7
52	Follow-up or routine lead and copper tap M/R					27	6	25
53	Water quality parameter M/R					11	1	11
56	Source water treatment (SOWT) M/R					11	1	11
57	OCCT/SOWT recommendation/study		11	1	11			
58	OCCT/SOWT install demonstration		0	0	0			
65	Public Education		7	0	7			
	SUBTOTAL		18	1	18	57	8	54

Violation Type	Consumer Confidence Report (CCR) and Public Notices (PN)	MCL	MCLs			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
71	Complete Failure to Report					205	1	205
75	Complete Failure to Report					83	35	62
	SUBTOTAL					288	36	267

Violation Type	Disinfectants and Disinfection Byproducts Rule	MCL (mg/L)	MCLs and MRDLs			Treatment Techniques			Monitoring/Reporting		
			Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation	Number of Violations	Number of RTC Violations	Number of Systems in Violation
02	MCL, average		100	0	37						
11	MRDL, non-acute		0	0	0						
13	MRDL acute		0	0	0						
12	Qualified operator failure					0	0	0			
46	Inadequate DBP precursor removal					4	0	2			
27	Major monitoring DBP								161	107	68
30	Major monitoring DBP2								0	0	0
35	Failure submit IDSE plan								0	0	0
	SUBTOTAL		100	0	37	4	0	2	161	107	68

Definitions for Violation Table

Disinfectants and Disinfection Byproducts Rule: This rule focuses on public health protection by limiting exposure to disinfection byproducts, specifically total trihalomethanes (TTHM) and five haloacetic acids (HAA5), which can form in water through disinfectants used to control microbial pathogens [40 CFR 141 Subparts L, U and V].

Ground Water Rule: The purpose of the rule is to reduce disease incidence associated with disease-causing microorganisms in drinking water. The rule establishes a risk-based approach to target ground water systems that are vulnerable to fecal contamination. Ground water systems that are identified as being at risk of fecal contamination must take corrective action to reduce potential illness from exposure to microbial pathogens. The rule applies to all systems that use ground water as a source of drinking water. [40 CFR 141, Subpart S]

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 action limits for lead and copper in drinking water [40 CFR 141.80-91]. Lead and copper corrosion can pose various health risks when ingested, 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/reporting (M/R):* SDWIS Violation Code 51 - The 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:* SDWIS Violation Code 52 - The system did not meet follow-up or routine lead and copper tap testing requirements, or failed to report the results.
- *Water Quality Parameter M/R:* SDWIS Violation Code 53 - Failure to monitor for Water Quality Parameters. Water Quality Parameters include pH, alkalinity, orthophosphate, silica, calcium, conductivity and water temperature.
- *Source Water Treatment M/R:* SDWIS Violation Code 56 - Failure to monitor the source water for lead and copper when the system fails to meet the lead or copper action level based on their tap water monitoring results.
- *Optimal Corrosion Control Treatment/Source Water Treatment (OCCT/SOWT) Recommendation/Study:* SDWIS Violation Code 57 - Failure to perform a study and submit a recommendation for corrosion control treatment that minimizes the lead and copper concentrations at user's taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.
- *OCCT/SOWT install demonstration (treatment installation)*: SDWIS Violation Code 58 - Failure to install corrosion control treatment.
- *Public education*: SDWIS Violation Code 65 - The system did not provide required public education about lead in drinking water.

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. MCLs are usually denoted in milligrams per liter (parts per million).

Maximum Residual Disinfectant Level (MRDL): A 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.

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

Number of RTC Violations: Represents a count of the number of violations that have Returned to Compliance (RTC) during the calendar year. The violation has been linked to the enforcement action SOX.

Number of Systems in Violation: Represents a count of the number of systems that have violations for the specific contaminant/rule occurring during the calendar year of the report that have not returned to compliance (RTC). The violation has not been linked to the enforcement action SOX.

Number of Violations: Represents a count of the number of violations for the specific contaminant/rule occurring during the calendar year of the report that have not returned to compliance (RTC). The violation has not been linked to the enforcement action SOX.

Organic Contaminants: Carbon-based compounds, such as industrial solvents and pesticides. These contaminants, classified as either Synthetic Organic Contaminants (SOCs) or Volatile Organic Contaminants (VOCs), generally get into water through runoff from cropland or discharge from factories.

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

- *Gross alpha:* SDWIS Contaminant Code 4000 for alpha radiation. Gross alpha includes radium-226, but excludes radon and uranium.
- *Uranium:* SDWIS Contaminant Code 4006 for uranium radiation.
- *Combined radium-226 and radium-228:* SDWIS Contaminant Code 4010 for combined radiation from these two isotopes.
- *Gross beta:* SDWIS Contaminant Code 4100 for gross beta particle activity from man-made radionuclides.

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 (SWTR): 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, Subparts H, P, T and W].

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- 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 - 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, if more than 5% of the samples are positive for total coliform, it is a violation.
- *Major routine and major repeat monitoring:* SDWIS Violation Codes 23 AND 25, respectively, indicate that a system did not perform proper monitoring.

Treatment Techniques: Treatment requirements that EPA established in lieu of an MCL to control unacceptable levels of certain contaminants. Failure to meet operational and system requirements under the Surface Water Treatment Rule, Groundwater Rule, and the Lead and Copper Rule have been included in this category of violations in this report.

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

INVENTORY INFORMATION

The information in the tables above is based on data retrieved from the state's computer system/databases—the state uses EPA's Safe Drinking Water Information System (SDWIS/State). The SDWIS/Fed (EPA) computer system/databases were used for comparative purposes only.

The Violation Table above does not contain all violation possibilities. Only certain violation types, per EPA's Annual Public Water Systems Compliance Report Instructions, are included in this report. In addition, only the violations from community, non-transient non-community (NTNC), and transient non-community systems are included in this report. At the time of this report, North Carolina had 2,064 active 'community' systems, 3,510 active 'transient non-community' systems, 385 active 'non-transient non-community' systems.