North Carolina's
Capacity Development Report
For
Public Water Systems

Calendar Year 2012

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Public Water Supply Section
N.C. Division of Water Resources
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STATE OF NORTH CAROLINA

Pat McCrory, Governor

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

John E. Skvarla, III, Secretary

N.C. DIVISION OF WATER RESOURCES

Thomas A. Reeder, Director

PUBLIC WATER SUPPLY SECTION

Jessica C. Godreau, Section Chief

Location:

512 N. Salisbury Street
Raleigh, NC
(919) 707-9100

Mailing Address:

Public Water Supply Section
N.C. Division of Water Resources
1634 Mail Service Center
Raleigh, NC 27699-1634

Submit questions or comments to James Coats, Capacity Development engineer, at (919) 707-9071. This report is available to the public on the N.C. Division of Water Resources' website at: www.ncwater.org/?page=80.

Contents

LIST OF COMMON TERMS

Capacity	Technical, managerial and financial capability to meet Safe Drinking Water Act requirements
DWP	Drinking Water Protection
DWSRF	Drinking Water State Revolving Fund
EPA	U.S. Environmental Protection Agency
NTNC	Non-transient Non-community water system
PWS Section	N.C. Public Water Supply Section
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System (database)
TNC	Transient Non-community water system
UNC	University of North Carolina at Chapel Hill

1.0 Introduction

The primary objective of the North Carolina Public Water Supply (PWS) Section is to ensure that water delivered by public water systems is safe for consumption and does not pose a danger to public health. This is accomplished through compliance oversight of the *North Carolina Drinking Water Act* and the federal *Safe Drinking Water Act*, which are represented in the *Rules Governing Public Water Systems* (*Rules*) and available online at www.ncwater.org/?page=192. A public water system is a water provider that delivers water for human consumption to at least 15 service connections or regularly serves an average of at least 25 individuals daily for at least 60 days of the year.

The PWS Section serves the public and assists public water systems through a multi-faceted approach that includes:

- Enforcement of compliance water sample monitoring activities and evaluation of analytical results
- Review and approval of engineering infrastructure plans and specifications
- Comprehensive site visits performed by regional office staff
- Award of low-interest rate loans and principal forgiveness loans for infrastructure projects
- Development of programs to encourage and support voluntary participation in local drinking water protection activities
- Examination and professional certification of water system operators
- Other initiatives designed to facilitate compliance with the *Rules*.

1.1 Definition of Capacity

The 1996 *Safe Drinking Water Act Amendments* obligated states to ensure that all new community water systems and new non-transient non-community (NTNC) water systems beginning operation after Oct. 1, 1999, demonstrate technical, managerial and financial capacity. In response, the PWS Section developed a Capacity Development Program to meet the state's specific needs. The goal of the Capacity Development Program is to require technical, managerial and financial planning of new and existing community and non-transient non-community water systems that will improve systems' service and sustainability. Therefore, "capacity" as used in this report refers to the technical, managerial and financial capabilities of a water system to comply with the provisions of the *Safe Drinking Water Act*.

The U.S. Environmental Protection Agency (EPA) required the PWS Section to develop milestones as part of its Capacity Development Program. The milestones are published by the PWS Section in the *Public Water System Capacity Development Guidance Document* (March 2000) and they are available online at www.ncwater.org/?page=81. The milestones primarily include tracking the number of projects that have completed the engineering infrastructure approval and certification requirements. Chapter 3 of this report discusses these milestones.

The milestones, while valuable and reflective of the increase in capacity of water systems in North Carolina, do not provide a comprehensive view of overall capacity gains across the state, nor do they reflect the combined efforts of PWS Section employees in the central and regional offices. A more comprehensive view of the PWS Section's dedication to water system capacity is realized when the milestones are considered in conjunction with improvements in compliance trends (Chapter 2), assistance provided to water systems by regional office staff (Chapter 4), low-cost water infrastructure loans and financial assistance (Chapter 5), statewide drinking water protection programs (Chapter 6) and the examination and certification of competent water system operators by the N.C. Water Treatment Facility Operators Certification Board (Chapter 7).

2.0 Assessing Water System Capacity through Compliance with Drinking Water Rules

Systems are required to monitor water samples for regulated contaminants identified by the EPA as being harmful to human health if ingested. Water samples are collected according to EPA-mandated monitoring schedules, and sample results are compared to contaminant-specific maximum contaminant levels. The locations and frequency of required samples are based on the population served, water system type, and source water type. In accordance with EPA requirements, the PWS Section issues a notice of violation (NOV) for each missed or incorrectly collected sample. Such violations are referred to as "monitoring violations." The EPA also requires that systems with contaminants detected above the maximum contaminant level (MCL) receive an NOV for each exceeding contaminant. These violations are referred to as "MCL violations."

The PWS Section uses monitoring and MCL compliance rates as indicators of water system capacity. The percentage of noncompliant systems, population served by compliant systems, performance of new public water systems and performance of systems that have been active since the beginning of the Capacity Development Program are evaluated to determine if overall compliance rates and capacity are increasing.

2.1 New Drinking Water Rule

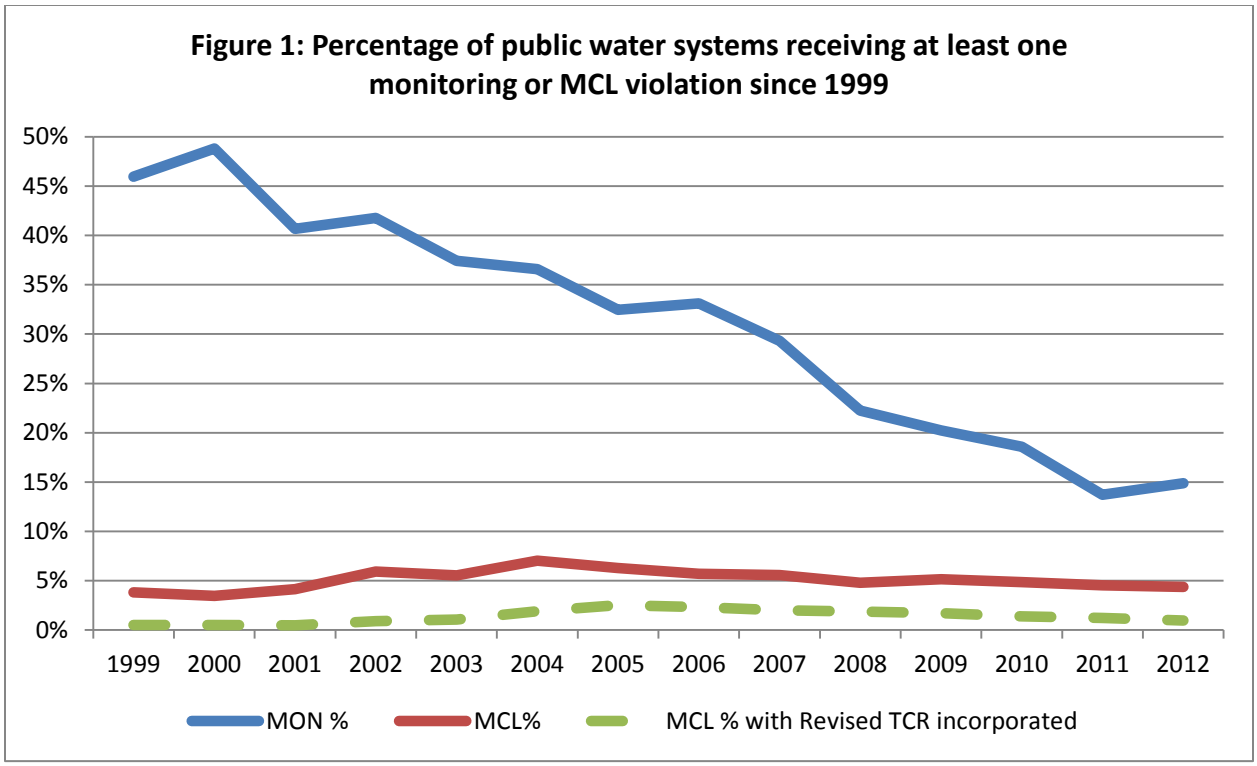
Public water systems will be required to comply with a new federal drinking water rule beginning in 2016. The new rule, titled the "Revised Total Coliform Rule" (Revised TCR), will replace the existing Total Coliform Rule. The Revised TCR reduces the total number of samples that water systems must collect and eliminates most of the MCL violations generated under the current Total Coliform Rule.

The PWS Section incorporated the parameters of the Revised TCR and back-calculated existing compliance data to determine if the upcoming rule would influence compliance rates in North Carolina. The back-calculated results indicate that MCL violations will decrease by approximately 60 percent and required samples will decrease by approximately 3 percent when the Revised TCR takes effect in 2016.

The impact of the Revised TCR can be observed graphically in Figures 1, 2 and 3 on pages 3, 5 and 8, respectively. Figure 1 shows the percentage of water systems that received at least one monitoring or MCL violation and the resultant percentage of systems that would have received an MCL violation with the Revised TCR incorporated. Figure 2 shows the percentage of the population served by systems with no monitoring or MCL violations and the resultant percentage of the population that would not have received an MCL violation with the Revised TCR incorporated. Figure 3 shows the decrease in the number of MCL violations and required samples due to the Revised TCR.

2.2 Overall Compliance Rates of Water Systems

Table 1 (shown on page four) provides compliance information for public water systems in North Carolina regarding federal and state drinking water regulations. Data from 1999 are included for comparison since the Capacity Development Program was not initiated until 2000. The systems are categorized by type and size of population served. The table shows the total number of systems in each category and the number of systems receiving at least one monitoring, or MCL NOV. Table 1 also shows the percentage of systems that received an NOV as compared to the total number of active water systems within each system category. Figure 1 provides a graphical representation of the data in Table 1. The percentage of systems receiving monitoring NOVs has decreased significantly since 1999, while the percentage of systems receiving MCL NOVs has remained stable. These results are significant considering federal requirements have become more stringent during the same time period and that increasing numbers of systems are completing all their monitoring requirements.



2.3 Population Served by Compliant Community Water Systems

Another method of evaluating capacity and compliance is by examining the number of people served by compliant public water systems. Figure 2 (page 5) shows that community water system compliance rates based on population served increased during the last five years despite federally mandated rule changes that increased compliance requirements. This method of evaluating compliance is influenced by the size of each water system that receives a violation. Large water systems contain greater percentages of the population than smaller systems. Violations received by large systems disproportionately decrease overall population compliance percentages. In 2012, approximately 98 percent of the population was served by systems with no MCL violations and 96 percent was served by systems with no monitoring violations. Approximately 1 percent of the population was served by water systems that received more than one MCL violation. No community systems received MCL violations for acute contaminants. Acute contaminants differ from chronic contaminants because they can cause an immediate health risk.

Table 1: The Number of Public Water Systems with Contaminant and Monitoring Violations

Calendar Year	Community						Non-transient non-community					Transient non-community					TOTALS				
	Population	Systems	MCL	%	MR	%	Systems	MCL	%	MR	%	Systems	MCL	%	MR	%	Systems	MCL	%	MR	%
1999 (baseline)	< 500	1,710	45	3%	487	28%	552	25	5%	180	33%	6,016	267	4%	3,315	55%	8,278	337	4%	3,982	48%
	500-9,999	557	10	2%	154	28%	132	1	1%	28	21%	85	0	0%	34	40%	774	11	1%	216	28%
	10,000-49,999	92	4	4%	15	16%	0					0					92	4	4%	15	16%
	≥ 50,000	24	1	4%	2	8%	0					0					24	1	4%	2	8%
	Totals	**2,383**	**60**	**3%**	**658**	**28%**	**684**	**26**	**4%**	**208**	**30%**	**6,101**	**267**	**4%**	**3,349**	**55%**	**9,168**	**353**	**4%**	**4,215**	**46%**
2009	< 500	1,523	53	3%	193	13%	377	9	2%	61	16%	3,820	193	5%	938	25%	5,720	255	4%	1,192	21%
	500-9,999	488	56	11%	61	12%	80	2	3%	4	5%	53	5	9%	5	9%	621	63	10%	70	11%
	10,000-49,999	98	10	10%	7	7%	0					0					98	10	10%	7	7%
	≥ 50,000	28	2	7%	4	14%	0					0					28	2	7%	4	14%
	Total	**2,137**	**121**	**6%**	**265**	**12%**	**457**	**11**	**2%**	**65**	**18%**	**3,873**	**198**	**5%**	**943**	**24%**	**6,467**	**330**	**5%**	**1,273**	**20%**
2010	< 500	1,526	38	2%	209	14%	371	8	2%	71	19%	3,747	203	5%	814	22%	5,644	249	4%	1,094	19%
	500-9,999	492	44	9%	62	13%	73	3	4%	11	15%	54	4	7%	14	26%	619	51	8%	87	14%
	10,000-49,999	101	8	8%	10	10%	0					0					101	8	8%	10	10%
	≥ 50,000	29	1	3%	3	10%	0					0					29	1	3%	3	10%
	Total	**2,148**	**91**	**4%**	**284**	**13%**	**444**	**11**	**2%**	**82**	**18%**	**3,801**	**207**	**5%**	**828**	**22%**	**6,393**	**309**	**5%**	**1,194**	**19%**
2011	< 500	1,503	41	3%	152	10%	350	7	2%	52	15%	3,694	183	5%	597	16%	5,547	228	4%	801	14%
	500-9,999	491	45	9%	51	10%	70	2	3%	8	11%	53	1	2%	6	11%	614	50	8%	65	11%
	10,000-49,999	103	8	8%	6	6%	0					0					103	8	8%	6	6%
	≥ 50,000	29	1	3%	3	10%	0					0					29	1	3%	3	10%
	Total	**2,126**	**95**	**4%**	**212**	**10%**	**420**	**9**	**2%**	**60**	**14%**	**3,747**	**184**	**5%**	**603**	**16%**	**6,293**	**287**	**5%**	**875**	**14%**
2012	< 500	1,473	28	2%	157	11%	343	8	2%	46	13%	3,635	191	5%	638	18%	5,451	227	4%	841	15%
	500-9,999	485	34	7%	51	11%	63	0	0%	10	16%	55	4	7%	9	16%	603	38	6%	70	12%
	10,000-49,999	103	6	6%	7	7%	0					0					103	6	6%	7	7%
	≥ 50,000	29	0	0%	2	7%	0					0					29	0	0%	2	7%
	Total	**2,090**	**68**	**3%**	**217**	**10%**	**406**	**8**	**2%**	**56**	**14%**	**3,690**	**195**	**5%**	**647**	**18%**	**6,186**	**271**	**4%**	**920**	**15%**

* Data were generated from the SDWIS database. Data in previous reports were generated from the legacy database and data for all years have been recalculated based on the SDWIS database. The classification of some water systems has been adjusted to match EPA water system type codes; a number of water systems included in previous reports are considered by EPA to be nonpublic systems and are not subject to federal regulation. Information is believed to be reliable and has been verified and revised as part of the data migration process.

† *"Population"* indicates the grouping of systems by the number of people served. 1999 population data is based on last available record prior to Oct. 1, 2005.

‡ *"Systems"* means the number of public water systems serving the population size indicated.

(Footnotes continued on page 5.)

(Footnotes continued from page 4.)

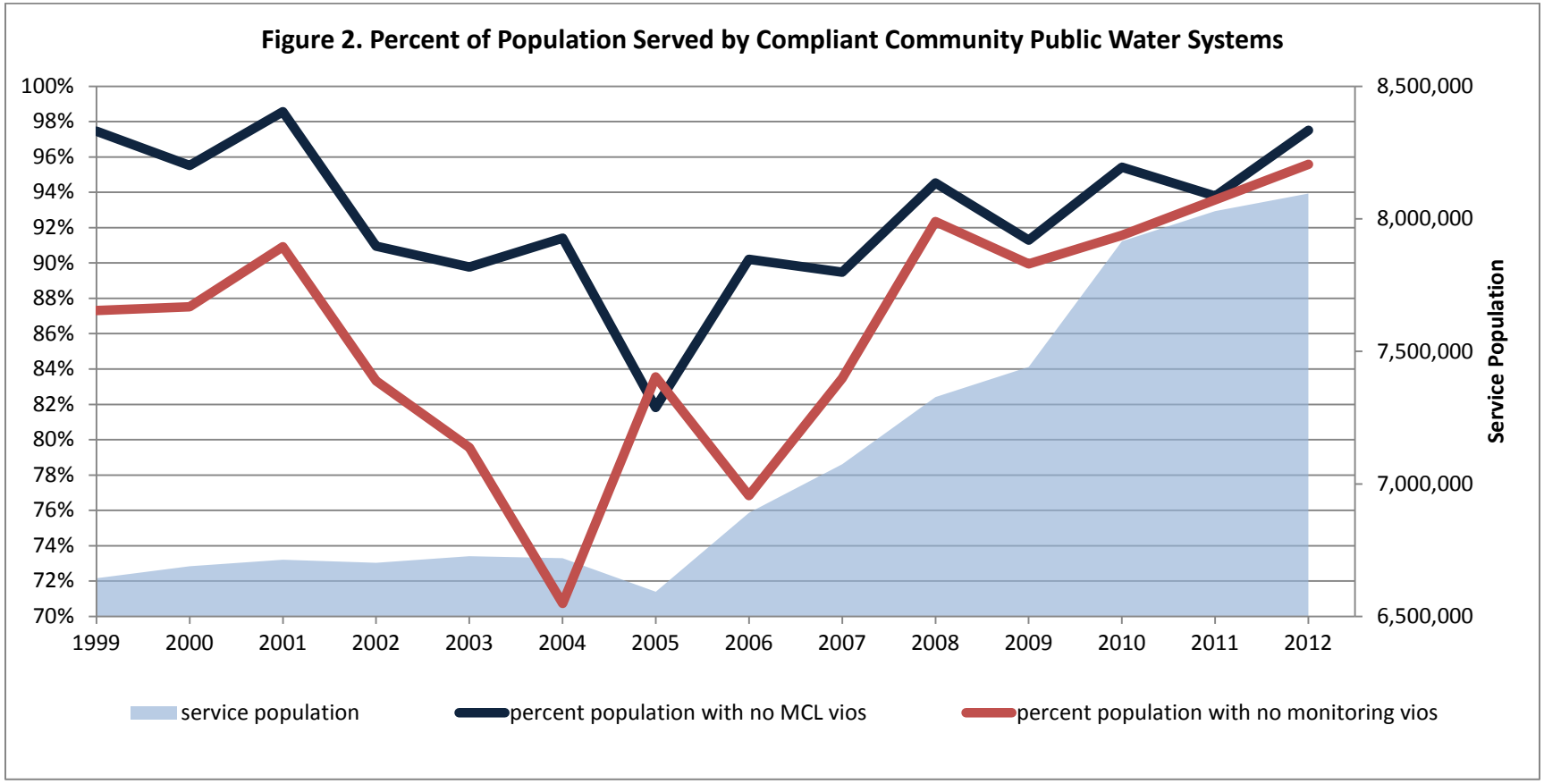
§ *"MCL"* means a violation concerning the maximum permissible level of a contaminant in water delivered by a public water system.

¶ *"MR"* means a failure to monitor for required water quality tests as defined by federal and state regulations.

Table 1 is a summary of the number of systems receiving one or more contaminant exceedance or monitoring violations in the given time period. The compliance rates do not account for the ever-increasing number of contaminants required for testing. New complex testing requirements have resulted in more monitoring violations. This will cause a lower compliance rate unless compensating improvements are made in other contaminant testing areas.

Systems with MR violations (Table 1) had such violations largely because water systems have numerous opportunities to collect and report on water quality. A typical system monitors at least monthly and has a large number of required tests. A system missing a single test during the course of a year will be shown as a violator.

The MCL violations (Table 1) indicate the number of systems with at least one contaminant exceeding permissible levels during the given year. A typical system has many opportunities to test during the course of one year. Most systems receiving bacteriological MCL violations return to compliance by the next compliance period. However, a public water system receiving at least one violation will appear on this table.



2.4 New System Performance

The PWS Section evaluates performance of new public water systems by tracking compliance rates following their initial date of operation. Table 3 compares new and "found" system performance to the performance of all systems during the period from 2010 through 2012. Found systems started operations without the knowledge or approval of the PWS Section and are discovered by regional office staff while conducting fieldwork. Found systems did not complete the plan review process and thus have not completed the capacity development milestones. These systems are often improperly constructed and have little or no understanding of compliance requirements. Staff work with these systems to prepare them for compliance oversight. The data show similar noncompliance rates between new and found systems, though monitoring compliance for found systems is better than for new systems. Similarly, monitoring compliance for existing systems is better than for new and found systems.

Table 4 (page 7) shows the beginning year of new systems and the historic compliance trends of those systems that have remained active. In general, these systems exhibit improving compliance rates as time increases, meaning that the longer a system is in operation, the better able it is to comply. This implies that improved operation and compliance can be learned. It also shows that additional work with new systems to improve initial compliance is needed.

Table 3: Comparison of Public Water Systems Beginning Operation Between 2010 to 2012 and All Active Public Water Systems During the Last Three Years With Contaminant and Monitoring Violations

System Begins (Years)	Compliance Period (Years)	Community						Non-transient non-community						Transient non-community						TOTALS					
		Systems	SS*	MCL	%	MR	%	Systems	SS	MCL	%	MR	%	Systems	SS	MCL	%	MR	%	Systems	SS	MCL	%	MR	%
All Systems 2010-2012	2010-2012	2,103	71%	180	9%	518	25%	434	85%	23	5%	143	33%	3,747	98%	502	13%	1,410	38%	6,284	88%	705	11%	2,071	33%
New Systems that completed the Capacity Development requirements 2010-2012	2010-2012	10	60%	0	0%	1	10%	9	89%	0	0%	2	22%	118	98%	13	11%	61	52%	137	95%	13	9%	64	47%
Found Systems [β] 2010-2012	2010-2012	50	90%	1	2%	14	28%	24	88%	1	4%	11	46%	99	100%	14	14%	43	43%	173	95%	16	9%	68	39%

* *Small Systems (SS)* indicates percent of systems that serve less than 500 persons and operated during the indicated state fiscal year.

[β] *Found Systems* indicates the number of public water systems identified during this three-year period that were not previously on the PWS Section inventory list. It is anticipated that the number of found systems will increase as PWS Section staff perform more inspections.

Table 4: The Number of Public Water Systems Beginning Operation Between 2005 to 2012 with Contaminant and Monitoring Violations

System Begins (Year)	Compliance Period (Year) ‡	Community						Non-transient non-community						Transient non-community						TOTALS					
		Systems	SS*	MCL	%	MR†	%	Systems	SS	MCL	%	MR	%	Systems	SS	MCL	%	MR	%	Systems	SS	MCL	%	MR	%
2005	2005	64	84%	2	3%	22	34%	11	55%	0	0%	5	45%	83	99%	8	10%	45	54%	158	90%	10	6%	72	46%
	2006	57	95%	3	5%	20	35%	11	55%	0	0%	7	64%	80	99%	11	14%	46	58%	148	94%	14	9%	73	49%
	2007	55	95%	1	2%	21	38%	11	55%	1	9%	7	64%	78	99%	8	10%	32	41%	144	94%	10	7%	60	42%
	2008	51	94%	1	2%	16	31%	9	44%	0	0%	1	11%	75	99%	4	5%	19	25%	135	93%	5	4%	36	27%
	2009	47	91%	3	6%	13	28%	8	50%	0	0%	1	13%	72	97%	7	10%	17	24%	127	92%	10	8%	31	24%
	2010	45	91%	5	11%	11	24%	8	50%	0	0%	1	13%	69	97%	7	10%	13	19%	122	92%	12	10%	25	20%
	2011	39	92%	2	5%	3	8%	7	57%	0	0%	0	0%	65	97%	3	5%	3	5%	111	93%	5	5%	6	5%
	2012	35	94%	1	3%	2	6%	5	60%	0	0%	0	0%	65	97%	4	6%	7	11%	105	94%	5	5%	9	9%
2006	2006	39	95%	2	5%	21	54%	13	85%	1	8%	10	77%	77	100%	2	3%	46	60%	129	97%	5	4%	77	60%
	2007	39	95%	3	8%	15	38%	11	82%	1	9%	7	64%	77	100%	6	8%	38	49%	127	97%	10	8%	60	47%
	2008	35	94%	1	3%	7	20%	9	89%	2	22%	2	22%	73	100%	3	4%	14	19%	117	97%	6	5%	23	20%
	2009	34	94%	1	3%	2	6%	7	86%	1	14%	0	0%	66	100%	4	6%	12	18%	107	97%	6	6%	14	13%
	2010	34	94%	1	3%	2	6%	5	80%	1	20%	0	0%	65	100%	1	2%	8	12%	104	97%	3	3%	10	10%
	2011	33	94%	2	6%	2	6%	4	75%	1	25%	1	25%	66	100%	4	6%	10	15%	103	97%	7	7%	13	13%
	2012	31	94%	2	6%	2	6%	3	100%	0	0%	0	0%	63	98%	3	5%	8	13%	97	97%	5	5%	10	10%
2007	2007	27	93%	2	7%	7	26%	10	70%	1	10%	3	30%	54	100%	2	4%	27	50%	91	95%	5	5%	37	41%
	2008	27	93%	6	22%	4	15%	10	70%	0	0%	5	50%	52	100%	1	2%	20	38%	89	94%	7	8%	29	33%
	2009	27	93%	7	26%	3	11%	9	67%	0	0%	2	22%	50	100%	3	6%	17	34%	86	94%	10	12%	22	26%
	2010	27	93%	5	19%	3	11%	7	57%	0	0%	2	29%	47	100%	1	2%	12	26%	81	94%	6	7%	17	21%
	2011	26	88%	3	12%	3	12%	8	63%	0	0%	0	0%	45	100%	1	2%	9	75%	79	92%	4	5%	12	15%
	2012	22	91%	2	9%	1	5%	8	63%	0	0%	1	13%	43	95%	2	5%	9	21%	73	93%	4	5%	11	15%
2008	2008	20	90%	0	0%	3	15%	4	100%	0	0%	0	0%	50	100%	2	4%	22	44%	74	97%	2	3%	25	34%
	2009	19	89%	1	5%	1	5%	4	100%	0	0%	0	0%	48	100%	4	8%	18	38%	71	97%	5	7%	19	27%
	2010	19	84%	1	5%	1	5%	4	100%	0	0%	2	50%	45	100%	0	0%	7	16%	68	96%	1	1%	10	15%
	2011	19	84%	1	5%	1	5%	4	100%	0	0%	2	50%	42	100%	3	7%	8	19%	65	95%	4	6%	11	17%
	2012	19	84%	2	11%	1	5%	4	100%	0	0%	0	0%	41	100%	3	7%	8	20%	64	95%	5	8%	9	14%
2009	2009	7	100%	0	0%	2	29%	5	100%	0	0%	2	40%	50	100%	2	4%	27	54%	62	100%	2	3%	31	50%
	2010	7	100%	0	0%	0	0%	4	100%	0	0%	1	25%	50	100%	3	6%	17	34%	61	100%	3	5%	18	30%
	2011	7	86%	1	14%	0	0%	4	100%	0	0%	2	50%	48	100%	2	4%	11	23%	59	98%	3	5%	13	22%
	2012	7	86%	0	0%	0	0%	3	100%	0	0%	1	33%	47	100%	3	6%	11	23%	57	98%	3	5%	12	21%
2010	2010	26	85%	1	4%	7	27%	10	70%	1	10%	2	20%	66	100%	1	2%	29	44%	102	93%	3	3%	38	37%
	2011	26	85%	0	0%	3	12%	11	73%	0	0%	3	27%	64	100%	3	5%	14	22%	101	93%	3	3%	20	20%
	2012	25	84%	0	0%	1	4%	9	67%	0	0%	1	11%	57	100%	0	0%	8	14%	91	92%	0	0%	10	11%
2011	2011	12	92%	0	0%	3	25%	6	100%	1	17%	1	17%	57	98%	6	11%	22	39%	75	97%	7	9%	26	35%
	2012	11	91%	0	0%	2	18%	6	100%	0	0%	1	17%	55	98%	6	11%	13	24%	72	97%	6	8%	16	22%
2012	2012	15	73%	0	0%	4	27%	10	90%	0	0%	4	40%	44	98%	4	9%	22	50%	69	63%	4	6%	30	43%

* *Small Systems (SS)* indicates percent of systems that serve less than 500 persons and operated during the indicated year.

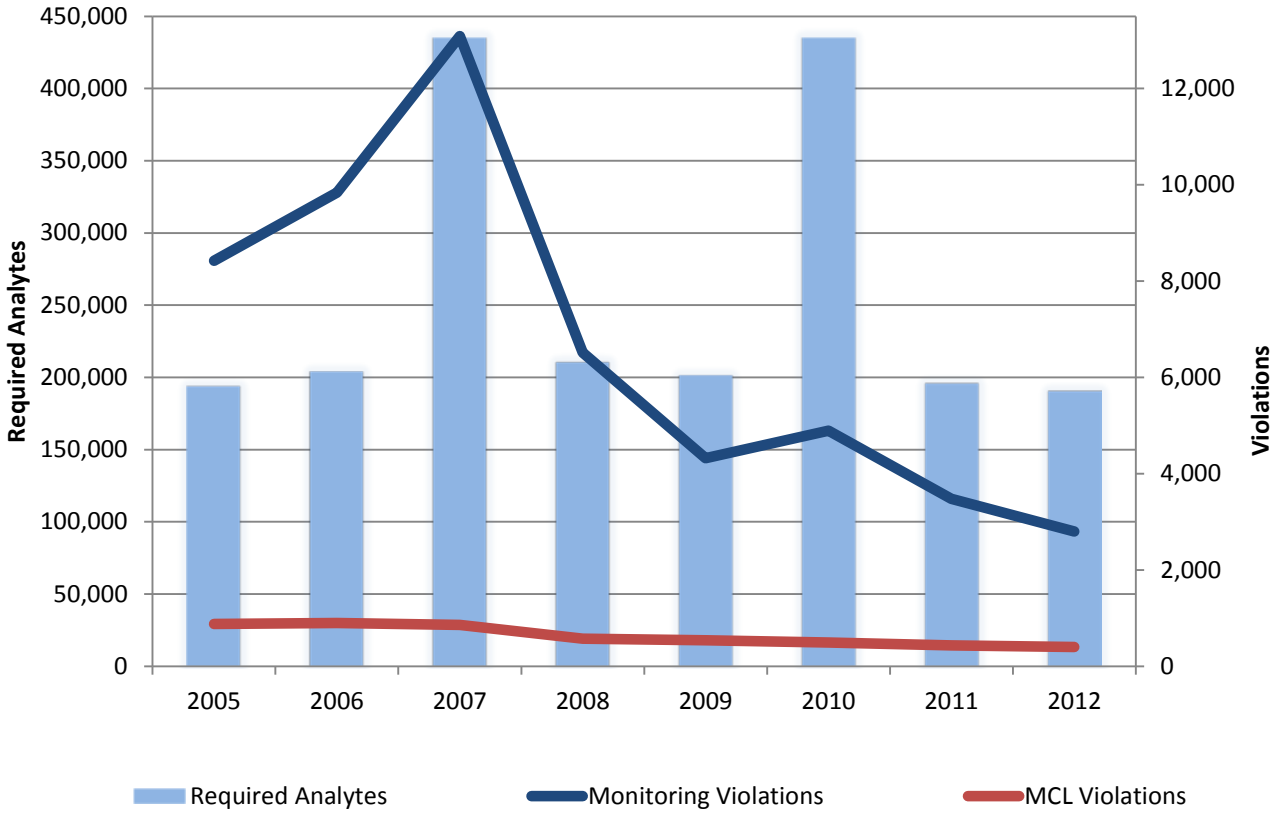
‡ *Compliance Period (Year)* summarizes the number of new systems that remain active and their compliance for each subsequent compliance period. For example, in 2012, only 35 of the 64 community systems that began operation in 2005 were still active.

2.5 Trend of Compliance Violations versus Required Contaminant Sampling Events

Contaminant monitoring schedules from 2005 through 2012 were analyzed with respect to total number of analytes, since many contaminant schedules include multiple analytes. Each analyte is a chemical compound, element or specific biological group required for analysis under federal rules, and omission of a single analyte results in a violation. The number of analytes required for analysis was compared to the number of monitoring and MCL violations issued for each calendar year during 2005 through 2012.

Figure 3 shows the total number of required analytes as bars (referenced by the scale on the left axis) versus the number of monitoring and MCL violations as lines (referenced by the scale on the right axis) issued to water systems during each calendar year. This figure shows that despite the substantial number of analytes required for analysis, the number of violations has decreased markedly since 2005. Many federal drinking water rules require three-year cyclical sampling to be performed and reported by the end of the three-year compliance periods ending in 2007, 2010, 2013, etc. The large increases of required analytes in 2007 and 2010 are due to these three-year compliance periods. The large spike in monitoring violations in 2007 is due to triennial samples that were not collected. The 2010 data do not show a similar spike, which implies that onsite activities performed by regional office staff, outreach efforts by central office staff, PWS Section-hosted trainings and other programs had a positive effect on monitoring compliance. Note that MCL violations dropped from 882 to 403 during the 8-year period.

Figure 3. Monitoring and MCL violations versus required analytes per calendar year for all public water systems



3.0 Assessing Capacity through Capacity Development Program Objectives

The August 2000 report, "North Carolina's Capacity Development Strategy for Existing Public Water Systems," identified indicators to evaluate the progress of the Capacity Development Program. An excerpt from this report is provided below.

> The primary component of North Carolina's Capacity Development Program is an evaluation of technical, managerial and financial capacity during the planning stages of new construction, expansion or system alteration. Therefore, a key indicator of water system capacity is compliance with the requirements specified in Section .0300 of the *Rules Governing Public Water Systems*. Specifically, the PWS Section uses existing databases to track the following information:
>
> - Number of public water systems with approved plans and specifications,
> - Number of public water systems with a completed water system management plan (WSMP),
> - Number of public water system projects with a submitted engineer's certification that documents the system is constructed in accordance with approved plans and specifications,
> - Number of public water system projects with an applicant certification that documents the system has an operation and maintenance plan and an emergency management plan
> - Number of public water systems that have an appropriate certified operator in responsible charge.
>
> The above information, in addition to compliance information, is used to measure improvements in capacity.
>
> In addition, the PWS Section tracks the number of water supply intakes with state-approved source water protection plans and/or source water assessments as a measure of improved capacity.

Supporting activities for capacity development include compliance and enforcement, source water protection planning and related activities that encourage local participation in drinking water protection activities. The PWS Section continues to explore ways in which information from these activities can to enhance the capacity of regulated water systems.

3.1 Increases in Systems Completing Capacity Development Measures

Table 5 is a summary of the numbers of systems that have completed the specific Capacity Development Program activities identified in Section 3.0. This table provides the percent completed compared to the total community and non-transient non-community systems.

By definition, systems that complete the measures depicted in Table 5 increase their capacity. The systems represented in Table 5 with plans approved have water infrastructure designed in accordance with applicable rules that help to ensure the water is treated and distributed safely. Systems covered by valid WSMPs have acknowledged their water system policies and have verified that their anticipated budget allows the system to remain viable over time. Systems with applicant certifications for projects have operation and maintenance protocols and emergency management plans, which are used for upkeep of the water system and can be applied during water-related emergencies. Systems with final approval have completed all the capacity development measures for at least one project.

Table 5: Capacity Development Measures

10/1/99 through:	Total Number of Community and Non-transient non-community Systems	Systems with Plans Submitted		Systems with Plans Approved		Systems Covered by Complete Water System Management Plans‡		Systems with Engineer's Certification		Systems with O&M and EM Plans*		Systems with Final Approval**	
		#	%	#	%	#	%	#	%	#	%	#	%
Dec. 31, 2002	3,104	916	29.5	779	25.1	1,055	34.0	479	15.4	188	6.1	189	6.1
Dec. 31, 2003	3,087	1,075	34.8	901	29.2	1,340	43.4	606	19.6	309	10.0	298	9.7
Dec. 31, 2004	3,045	1,212	39.8	1,012	33.2	1,405	46.1	718	23.6	439	14.4	428	14.1
Dec. 31, 2005	2,776	1,310	47.2	1,118	40.3	1,453	52.3	839	30.2	538	19.4	549	19.8
Dec. 31, 2006	2,749	1,399	50.9	1,210	44.0	1,500	54.6	939	34.2	711	25.9	727	26.4
Dec. 31, 2007	2,705	1,477	54.6	1,291	47.7	1,521	56.2	1,076	39.8	995	36.8	954	35.3
Dec. 31, 2008	2,649	1,564	58.9	1,366	51.5	1,591	59.9	1,173	44.2	1,104	41.6	1,077	40.6
Dec. 31, 2009	2,549	1,644	63.2	1,445	55.6	1,577	60.6	1,310	50.4	1,255	48.3	1,247	47.9
Dec. 31, 2010	2,592	1,701	65.6	1,503	57.9	1,606	61.9	1,385	53.4	1,336	51.5	1,328	51.2
Dec. 31, 2011	2,546	1,744	68.5	1,554	61.0	1,614	63.4	1,450	57.0	1,406	55.2	1,398	54.9
Dec. 31, 2012	2,496	1,788	71.6	1,600	64.1	1,624	65.1	1,503	60.2	1,453	58.2	1,452	58.2

*Tank rehabilitation projects do not require an Applicant Certification or a WSMP. A water system may receive final approval for a tank rehabilitation project based on a valid engineer's certification only.

**It is important to note that not all projects are built during the same year that plans are approved and that an authorization to construct is issued. An authorization to construct is valid for a period of two years. Some projects that receive this authorization are not constructed.

‡ The number of systems covered by complete WSMPs has been updated to include multiple systems under single ownership with a master WSMP.

"*Systems with Plans Submitted*" means the number of systems with at least one set of engineering plans and specifications submitted for review during the indicated period.

"*Systems with Plans Approved*" means the number of systems with at least one set of engineering plans and specifications reviewed and approved during the indicated period.

"*Systems with Water System Management Plan Complete*" means the number of systems with at least one WSMP completed during the indicated period.

"*Systems with Engineer's Certification*" means the number of systems having at least one engineer's certification during the indicated period that a project was constructed according to approved plans and specifications.

"*Systems with O&M and EM Plans"* means the number of systems having at least one applicant certification during the indicated period that a project had an operation and maintenance plan and an emergency management plan.

"*Systems with Final Approval"* means the number of systems meeting all our capacity development requirements during the indicated period and for which a permit to operate was issued.

The Capacity Development Program has assured that an increasing number of public water systems have evaluated their capacity in accordance with the program's objectives as discussed in Section 3.0. From Oct. 1, 1999 through the end of 2012, approximately 1,790 systems submitted 27,052 projects for review. A total of 1,452 systems achieved final approval status. The PWS Section sends written correspondence on a monthly basis to systems that have projects approaching their "authorization to construct" deadline and for which no engineer's certification or applicant certification have been received. This correspondence informs the system to submit the required documentation, request an extension of the authorization to construct, or withdraw the application if the project will not be constructed. As of Dec. 31, 2012, approximately 1,624 systems submitted a WSMP self-assessment deemed satisfactory by the PWS Section. Note that one WSMP may include multiple systems under single ownership.

The PWS Section has received an average of approximately 1,930 plans a year since the inception of the Capacity Development Program. The PWS Section either approves the plans or issues comments for plans that do not meet minimum rule requirements. It is important to note that not all plans submitted to the PWS Section are approved. Roughly 9 percent of plans submitted are withdrawn by the applicant or recycled by the PWS Section due to the applicant's lack of response to comments after an extended period. The PWS Section sends reminder letters to applicants and provides an opportunity to respond to comments prior to recycling the project.

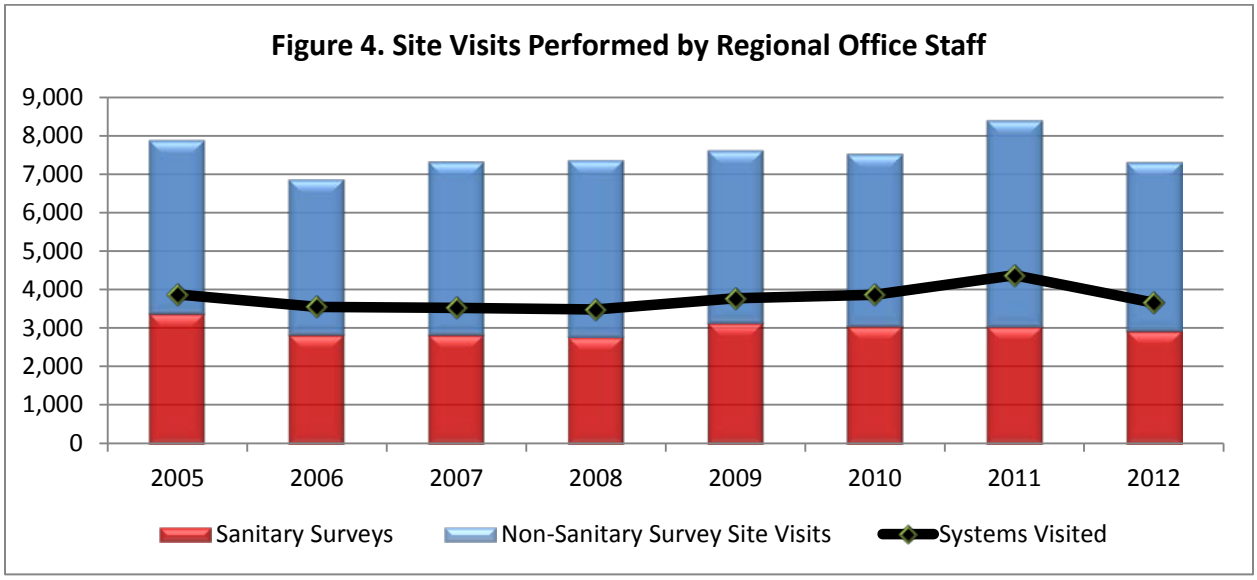
Completion of the Capacity Development Program requirements indicates that a public water system has completed operation and maintenance plans and emergency management plans. These plans are valuable tools for the proper maintenance of the system and provide incentive for the system to prepare for emergency and disaster events. With this requirement, the PWS Section has built a strong foundation regarding recent security concerns and federal requirements for vulnerability assessments and disaster preparedness for public water systems.

4.0 The PWS Section Regional Offices

The PWS Section regional offices play a vital role in supporting and maintaining water system capacity throughout the state. Regional office staff provide services that are crucial to increasing water system capacity through better compliance with sampling and engineering infrastructure requirements. Regional office staff also provide input to improve system management, operations and operator compliance.

4.1 Site Visits

The seven regional offices provide support primarily through visits to water systems. The most common reasons for visits are to perform sanitary surveys, provide technical assistance, perform informal and construction inspections, perform investigations regarding violations or complaints and to provide compliance assistance. As seen in Figure 4, the PWS Section regional office staff performed approximately 7,300 visits to water systems in 2012, of which 2,929 were sanitary surveys. The numbers in Figure 4 depict only distinct site visits performed regardless of the number of staff that participated in the visit. Previous reports summed the number of site visits performed by each staff member. Previous visit totals are higher than the totals in this report because some site visits require several staff members to complete in a timely manner.



Many site visits focus on customer service and provide assistance regarding technical and regulatory concerns. The solid line depicts the number of systems visited annually and the stacked columns depict the number and type of visits performed per year. PWS Section regional staff often make several visits to a given system during the course of the year to help solve site-specific problems. A total of 1,493 of the 3,652 water systems visited in 2012 were community systems, which serve nearly 7.7 million consumers.

4.1.1 Sanitary Surveys

The sanitary survey is the most comprehensive site visit the regional offices perform. Sanitary surveys are EPA-mandated site visits performed by field staff to identify deficiencies in technical and managerial capacity. The following aspects of a water system are evaluated during the sanitary survey:

- Source water
- Water treatment
- Distribution system
- Finished water storage
- System pumps
- Monitoring and reporting data verification
- Management and operations
- Operator compliance.

The PWS Section staff member performing the sanitary survey inspects the water system for approximately 190 potential deficiencies that can exist within the aspects listed above. These deficiencies are classified as significant deficiencies, minor deficiencies and recommendations. All significant and minor deficiencies are rule-based, whereas recommendations represent preferred practice. The regional staff assists water systems by providing technical assistance to correct any deficiencies that exist. As a result of these sanitary surveys, technical and managerial capacity issues are identified and corrected. Additionally, the PWS Section regional staff is able to recommend improvements that have the potential to benefit the water system and improve capacity.

Sanitary surveys are performed at surface systems once a year, community well systems every three years, and non-community systems every five years.

4.1.2 Non-Sanitary Survey Site Visits

In addition to sanitary surveys, regional office staff perform other types of visits to water systems. The most common types of non-sanitary survey visits are described below.

- *Technical Assistance* – Staff provide assistance with technical issues that require industry knowledge and expertise. Examples of technical assistance visits include evaluating leaks, well water pump and storage issues, treatment adjustments, cross connection control, etc.
- *Informal System Inspection* – These inspections vary in scope and can include updating ownership information, testing residual disinfectant concentration, collecting new well information, reviewing rules with the owner or operator to facilitate compliance and other tasks.
- *Construction Inspection* – Staff periodically inspect projects under construction to confirm they are constructed in accordance with the approved plans and specifications. Any non-approvable variations noted during construction can be corrected prior to completion of the project, which helps ensure that approved projects can be placed into service as quickly as possible.
- *Investigation* – An investigation may be performed when a water system receives a violation or if a customer has issued a complaint regarding water service or quality. In the event of a coliform violation, regional staff may help collect samples to determine if the coliform contamination has been abated, and staff has provided instruction if the water remains positive for coliform. Regional staff provide training to water system representatives for response to other violations. If there are customer complaints, regional staff communicate with the complainant and collect and analyze water samples if warranted.
- *Compliance Assistance* – Regional staff provide education and materials to water system representatives to facilitate a return to compliance.

Visits performed by regional office staff help systems increase their capacity through better compliance with sampling and engineering infrastructure requirements, as well as with management, operations and operator compliance concerns.

5.0 Water System Infrastructure Funding

The PWS Section, through the Drinking Water State Revolving Fund (DWSRF), is able to increase the capacity of water systems by providing funding mechanisms for capital improvement projects. DWSRF funding is made available through low-interest and principal forgiveness loans. The loan program has been permanently moved to the new N.C. Division of Water Infrastructure effective July 1, 2013, but was part of the PWS Section during this reporting period.

5.1 Drinking Water State Revolving Fund

Water systems must apply to the DWSRF Program for funding consideration. The PWS Section prioritizes the applications and selects the highest priority projects for funding. The PWS Section uses the DWSRF Program to address the following short-term objectives associated with water systems:

- Provide loans to reduce acute health risks
- Provide loans to enable water systems with the adequate capacity to consolidate non-viable water systems
- Provide funding for preventative and efficiency measures, such as proactive source water protection and replacement of aging infrastructure
- Provide technical assistance for small systems.

Through its ongoing funding activities, the DWSRF Program increases capacity for water systems throughout North Carolina by promoting the following long-term objectives:

- Increase the percent of population served by safe public water systems
- Increase the safety of public water systems
- Promote safe and affordable drinking water by reducing costs associated with capital improvements
- Assist water systems to remain compliant with increasingly complex rules under the *Safe Drinking Water Act*
- Ensure technical integrity of the proposed water system improvements, advocate self-sufficiency, protect water resources from new pollution sources and promote sustainability.

As of the end of fiscal 2013, approximately $450 million of DWSRF Program funds were committed to systems in the form of low-interest and principal forgiveness loans. The DWSRF Program continually increases its ability to provide low-interest loans to water systems through federal capitalization grants, the required 20 percent state match and the repayment-funding stream of revolving loans.

5.1.1 Disadvantaged Community Program

Many systems, especially small systems, lack the resources needed to provide consistent safe drinking water to the public as required by the EPA. This situation may result in long-term noncompliance. Through the North Carolina Disadvantaged Community Program, the PWS Section has developed a strategy to consolidate problem systems with reliable, compliant water suppliers. A community served by a public water system that lacks capacity as defined in the SDWA, Sections 1420 and 1452 (a)(3), is defined as a Disadvantaged Community.

Principal forgiveness loans are available to water systems having adequate capacity to take over the failing system. In most cases, this process includes installing supply lines and replacing the distribution system in failing system. Currently, the PWS Section is working to consolidate eight non-viable public water systems. These systems serve about 98,000 residents. Completion of these consolidation projects will give these residents access to water systems with greater capacity. In addition to these efforts, the PWS Section has consolidated 23 non-viable systems since the program's inception in 2004.

5.1.2 Fast-Track Loans

The DWSRF Program implemented a fast-track loan option to decrease the time required to provide funding for infrastructure projects. The fast-track loan option allowed faster funding for applicants that were ready to proceed and willing to waive the opportunity to compete for principal forgiveness loans. In contrast to the traditional DWSRF application process, applicants seeking a fast-track loan were not required to submit prioritization information or wait for the annual review cycle. The fast-track loan option provided access to available funds on a first-come first-serve basis to increase the speed of awarding funds significantly. This option allowed applicants to

begin construction of water system infrastructure projects sooner than those funded through traditional DWSRF loans. The DWSRF Program committed about $13 million to eight fast-track loan projects during fiscal 2013.

6.0 Drinking Water Protection

The PWS Section, through the N.C. Drinking Water Protection Program, offers services to assist in the protection of local drinking water sources. This program is non-regulatory. Water systems may voluntarily participate to improve their current and long-term capacity by implementing proactive steps to reduce potential contamination. The program offers technical assessments of the state's more than 9,000 drinking water sources, and it maintains financial incentives through a network of collaborating state agencies.

6.1 N.C. Drinking Water Protection Program

The PWS Section continued to improve and implement North Carolina's Drinking Water Protection (DWP) Program in 2012. The DWP Program evaluates the susceptibility to contamination and initiates protective strategies for the state's public drinking water resources. It is the only statewide program with an exclusive concentration on proactive drinking water source protection. Activities include delineation and assessment of drinking water sources, wellhead and surface water protection, coordination with other state agencies, and initiation of new programs designed to encourage local DWP Program efforts. These activities allow public water systems to protect their water sources, supporting a multi-barrier approach to drinking water protection. Systems that maintain drinking water sources that are less susceptible to contamination may achieve greater financial and technical capacity because fewer resources are expended for water treatment.

North Carolina's DWP Program is recognized as a national leader and is considered by the EPA as a model for other states. As such, program staff are often invited to share successful strategies and to provide perspective at national meetings and conferences.

Partnership arrangements with other agencies and programs are a major component of the PWS Section's drinking water protection strategy. Specifically, other agencies integrate DWP Program data into their agendas and funding priorities. For example, in 2012 North Carolina's Clean Water Management Trust Fund granted awards totaling $145,000 for projects focused on local source water protection planning. The DWP Program maintains relationships with agencies that fund agricultural best management practices (BMPs), stormwater BMPs, land conservation, and stream restoration projects. Additionally, the N.C. DWP Program continued to facilitate a statewide DWP Collaborative (formed in December 2011) that includes representatives from university programs, government agencies, non-profit organizations, professional associations, and regional councils of government. This diverse and semi-autonomous group has agreed to provide expertise and resources to implement strategies that encourage DWP activities.

The DWP Program continued to improve the functionality of its geographic information system mapping applications, which exist to assist local governments, water system owners, volunteer organizations and other agencies with information vital to drinking water protection. Susceptibility ratings and associated assessment results are critical components of this data and are summarized in reports made available via the PWS Section's geographic information application, and can be found by going to: www.ncwater.org/?page=63. Agencies enlisting drinking water protection as a priority item within their own environmental programs use the PWS Section's geographic information system locator to help locate and prioritize environmental projects. The GIS locator can be found by going to: www.ncwater.org/?page=102.

The N.C. DWP Program promotes and provides technical expertise to assist communities with local source water protection planning. A seven-step process has been used successfully across the state to protect both ground and surface water sources. To date, the PWS Section has approved five local surface water protection (SWP) plans, which serve to protect drinking water for approximately 220,000 people. The source water protection planning process empowers local stakeholders to define and achieve long-term, proactive drinking water protection goals.

6.2 N.C. Wellhead Protection Program

The SDWA Amendments of 1986 established requirements for states to develop Wellhead Protection (WHP) programs. These programs were intended by Congress to be a key part of a national groundwater protection strategy to prevent contamination of groundwater that is used as a public drinking water supply. North Carolina's EPA-approved WHP Program is part of this national strategy. The WHP Program is a pollution prevention and

management program designed to protect groundwater sources of public drinking water supply. Public water systems that choose to participate in the program develop and submit a local WHP plan to the PWS Section for review and approval.

In North Carolina, development of a local WHP plan is voluntary and is viewed as a valuable supplement to existing state groundwater protection programs. The PWS Section's WHP Program is intended for city and county governments and water supply operators that decide to provide added protection to their local groundwater supplies. Upon implementation, the local WHP plan reduces the susceptibility of wells to contaminants. The reduction of susceptibility to contamination increases the capacity for water systems to provide compliant drinking water by eliminating the need to install costly treatment options to remove contaminants.

Ten WHP plans were approved during the current reporting period. The WHP plans approved during the current reporting period increases the number of public water systems with an approved local WHP plan to 135. These 135 public water systems comprise 861 public water supply wells serving approximately 920,000 people. It is expected that these plans will assist in reducing the susceptibility of these sources of public drinking water to contamination.

In addition to the review of completed WHP plan submittals, the WHP Program reviewed draft wellhead protection area (WHPA) delineations submitted by public water systems in the early stages of plan development. This allows the systems to receive tentative approval of their WHPAs prior to proceeding with development of the remaining plan components (i.e., potential contamination source inventory, management plan, etc.), which could be impacted by changes to the WHPAs.

The WHP Program continued to provide support to the state's Source Water Assessment Program (SWAP) and the Drinking Water Protection Program. Program support included review of work products and analysis relevant to delineation and assessment activities participation in the Source Water Collaborative, as well as assisting in the generation of SWAP reports.

7.0 N.C. Water Treatment Facility Operators Certification Board

The N.C. Water Treatment Facility Operators Certification Board, which is supported by the PWS Section, is responsible for examination of water system operators and certification of their competency to supervise the operation of water system facilities. North Carolina has approximately 5,100 certified water system operators with about 7,100 active operator certifications. In order to facilitate the education of operators, the certification board also approves schools in North Carolina that offer operator training courses. In an effort to increase the number of opportunities to take operator exams, the certification board has started using electronic testing methods in addition to traditional paper and pencil exams. Additionally, the certification board has promoted the use of scanning technology for operator identification at continuing education courses, which helps ensure that the certification board's records accurately reflect the status of operators' continuing education requirements. The PWS Section together with the N.C. Waterworks Operators Association, the N.C. Rural Water Association, and the N.C. American Water Works Association coordinate schools, seminars, workshops and conferences. PWS Section staff provide technical training and assistance at these events. This program has increased the capacity of public water systems by directly influencing the training and increasing the competency of public water system operators.

8.0 Partnerships

The PWS Section engages in voluntary and contractual partnerships to enhance capacity development efforts in North Carolina. Participation with U.S. EPA's Area-Wide Optimization Program and contracts with the N.C. Rural Water Association and the UNC School of Government Environmental Finance Center serve to augment the already substantial efforts put forth by the PWS Section.

8.1 Area-Wide Optimization Program

The Area-Wide Optimization Program, or AWOP, is a joint program between the EPA and states that was developed to help water systems meet increasingly stringent regulations and achieve higher levels of water quality. The PWS Section has participated in AWOP since 2000 and works cooperatively with water systems to use existing equipment and treatment processes to improve or optimize water quality.

A typical scenario under AWOP is for PWS Section employees, AWOP participants from other states, and representatives from the EPA to optimize the water treatment processes of a water system that has volunteered to host the AWOP activities. These activities enhance capacity by optimizing the capabilities of the volunteering water system while allowing all AWOP participants to share and increase their knowledge of water treatment.

In August 2012, AWOP team members presented an extended terminal subfluidization wash (ETSW) filter study in the city of Wilson. The ETSW procedure involves extending the normal backwash duration at a subfluidization flow rate for an amount of time sufficient to move one theoretical filter volume of water through the filter box. Implementation of ETSW has been shown to reduce filter ripening periods and reduce or eliminate filtering to waste.

The PWS Section awarded 49 systems the 2012 AWOP Award for optimized treatment at their drinking water treatment facilities. These awards are presented by PWS Section regional staff in the presence of the governing body of the water system. These awards are given to water systems each year that demonstrate outstanding turbidity and microbial removal and for meeting performance goals that are more stringent than the state and federal drinking water standards. These goals are met by increased surveillance, by reducing treatment fluctuations and by maintaining excellent coagulation and filter performance. By reaching this level of optimized performance, employees of these water systems have demonstrated their dedication to provide their customers with the best possible drinking water quality. Providing public recognition of these awards builds elected officials' support with the utility staff activities and may help expand the number of participating systems.

8.2 UNC School of Government Environmental Finance Center

The PWS Section, through partnership with the UNC School of Government's Environmental Finance Center, has assisted in the establishment and strengthening of partnerships and collaboration between water systems, maintaining sustainable finances and rate setting. The Environmental Finance Center updated deliverables from previous contracts and executed new projects. Key projects are identified below.

The Environmental Finance Center is currently working with the PWS Section on the following projects:

- Assessing the managerial capacity of water systems in North Carolina and ranking systems in terms of their managerial capacity needs
- Training to assist water systems with managerial capacity needs
- Assessing the feasibility of water system management partnerships.

The projects under development will assist water systems with financial planning and enable the PWS Section to increase financial capacity of water systems in North Carolina.

8.3 N.C. Rural Water Association

The PWS Section has a contractual agreement with the N.C. Rural Water Association for circuit riders to provide technical assistance to water systems that serve fewer than 10,000 people. This circuit rider receives system referrals from the PWS Section as well as requests for assistance from other sources. During the reporting period, the circuit rider completed 871 contacts to systems with issues such as compliance and treatment, operation and maintenance, water loss and leak detection, management techniques and emergency response. The circuit rider conducts initial visits to referred water systems to explain monitoring requirements and to enhance the systems' ability to meet all regulatory requirements.

9.0 Conclusion

Overall water system compliance has increased significantly since the PWS Section started implementing the capacity development strategies discussed in this report. The PWS Section continues to add new initiatives to improve compliance. Compliance with sample collection and monitoring requirements has increased from 55 percent of systems in 1999 to 85 percent of systems in 2012. Compliance with MCLs has remained roughly constant during the time period. Since 1999, several federal drinking water rules were implemented which introduced additional sampling requirements and new MCLs, resulting in a more complex regulatory environment for water systems.

The PWS Section focuses the intent of all activities on increasing water system compliance and protection of public health, such as:

- Regional office site visits
- Central office-sponsored trainings and outreach activities
- Review and approval of water system infrastructure plans
- Certification and training of water system operators
- Partnerships with other institutions to increase system outreach activities and develop tools to aid in achieving and maintaining compliance.

The PWS Section believes these activities improve overall water system compliance throughout the state and that these activities will continue to be crucial to achieving and maintaining water system compliance with federal drinking water rules.

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Appendix A

Table A.1: Schedule of New Rule Implementation by EPA

Calendar Year	Rule	New Monitoring Requirements	New Level (MCL or Treatment Technique) Requirements	System Description
2002	Arsenic		MCL lowered from 0.05 mg/l to 0.01 mg/l	CWS, NTNC
2002	Disinfectants and Disinfection Byproducts Rule (DDBP)	THM and HAA quarterly sampling	THM MCL lowered from 0.10 mg/L to 0.080 mg/L as a running annual average (RAA). HAA MCL established at 0.060 mg/L as RAA.	CWS, NTNC Subpart H, population >= 10,000
2002	DDBP	Disinfectant residual monthly sampling (with total coliform rule schedule)	Chlorine and chloramines maximum residual disinfectant level established at 4.0 mg/L as RAA.	CWS, NTNC Subpart H, population >= 10,000
2002	DDBP	Total organic carbon (TOC) monthly monitoring	Treatment technique for TOC removal; ratio of actual to required removal >= 1.00 as RAA.	CWS, NTNC Subpart H, population >= 10,000
2002	DDBP	Bromate monthly monitoring	Bromate < 0.010 as RAA.	CWS, NTNC Subpart H using ozone, population >= 10,000
2002	Interim Enhanced Surface Water Treatment Rule (IESWTR)	Profiling and benchmarking		All system types Subpart H, population >= 10,000
2002	IESWTR	Turbidity	Maximum turbidity level lowered from 5 NTU to 1 NTU. 95% turbidity level lowered from 1 NTU to 0.3 NTU.	All system types Subpart H, population >= 10,000
2004	DDBP	THM and HAA quarterly or annual sampling	THM MCL lowered from 0.10 mg/L to 0.080 mg/L as RAA. HAA MCL established at 0.060 mg/L as RAA.	CWS, NTNC Subpart H including populations < 10,000; Groundwater
2004	DDBP	Disinfectant residual monthly sampling (with TCR schedule)	Chlorine and chloramine maximum residual disinfectant levels established at 4.0 mg/L as RAA.	CWS, NTNC Subpart H including populations < 10,000; Groundwater
2004	DDBP	TOC monthly monitoring	Treatment technique for TOC removal; ratio of actual to required removal >= 1.00 as RAA.	CWS, NTNC Subpart H including populations < 10000
2004	DDBP	Bromate monthly monitoring	Bromate < 0.010 as RAA.	CWS, NTNC Subpart H including populations < 10,000; Groundwater

Cont'd on page A-3

Table A.1 cont'd: Schedule of New Rule Implementation by EPA

Calendar Year	Rule	New Monitoring Requirements	New Level (MCL or Treatment Technique) Requirements	System Description
2005	Long Term 1 Surface Water Treatment Rule (LT1SWTR)	Profiling and benchmarking		All system types Subpart H, populations <10,000
2005	LT1SWTR	Turbidity	Maximum turbidity level lowered from 5 NTU to 1 NTU. 95% turbidity level lowered from 1 NTU to 0.3 NTU.	All system types Subpart H, populations <10,000
2008	Radionuclides	Radium 228, monitored at each entry point	Although new radionuclides monitoring requirements do not take effect until 2008, a number of systems began monitoring early in order to grandfather data. Early monitoring led to additional MCL violations.	CWS
2009	Ground Water Rule	Microbial source water monitoring	Introduces source water monitoring requirements and treatment technique requirements for groundwater systems.	All system types Not Subpart H
2012	Stage 2 Disinfectant / Disinfection Byproducts Rule	Location-specific sampling points in the distribution system	MCLs and regulated contaminants do not change but compliance is calculated by locational running annual average. Every sampling site must be compliant with MCL.	CWS, NTNC