North Carolina's Capacity Development Report for Public Water Systems

Fiscal Year 2007

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Public Water Supply Section
Division of Environmental Health
Department of Environment and Natural Resources

STATE OF NORTH CAROLINA

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http://www.deh.enr.state.nc.us/pws/

Contents

LIST OF ACRONYMS

Capacity	Technical, Managerial and Financial Capacity
PWS Section	North Carolina Public Water Supply Section
SDWA	Safe Drinking Water Act
EPA	United States Environmental Protection Agency

I. EXECUTIVE SUMMARY

The Public Water Supply Section (PWS Section) of the North Carolina Department of Environment and Natural Resources is the primary agency responsible for assuring that the people of North Carolina are provided safe drinking water from public systems. Public water systems range from large municipalities to country stores that serve a minimum of 25 individuals for 60 days per year. The complexity of the federal Safe Drinking Water Act (SDWA) can make compliance difficult to achieve for many small systems. Of the approximately 6,800 regulated public water systems, about 5,900 serve a population of less than 500.

The PWS Section has a long history of responding to needs of public water suppliers through:

- surveillance of all public water supplies;
- enforcement of public water supply rules;
- consultation and assistance in planning and designing water supply systems;
- assistance with source water protection;
- review of technical plans and specifications for water supply construction;
- providing training programs for water works operators;
- investigation of hazards that may affect public water supplies; and
- administration of loans, grants, and bonds available for system improvements.

The 1996 Safe Drinking Water Act Amendments require withholding 20 percent of a state's Drinking Water State Revolving Fund Capitalization Grant unless the state obtains the means to ensure that all new community water systems and new non-transient non-community water systems beginning operation after October 1, 1999 demonstrate technical, managerial, and financial capacity with respect to each national primary drinking water regulation in effect, or likely to be in effect, on the date operations start. The PWS Section responded to this requirement by creating the Capacity Development Program. The goal of this program is to require technical, managerial, and financial planning of new community and non-transient non-community water systems to improve the service and sustainability of the systems. The Capacity Development Program also involves the State's ability to enforce requirements of the North Carolina Drinking Water Act. The Capacity of the PWS Section is enhanced by the coordination of these efforts.

In October 1999, the PWS Section adopted revised rules requiring community and non-transient non-community public water systems that are expanding or altering their system to conduct a self-assessment with documentation describing their technical, managerial, and financial viability and submit it to the State. It includes requirements for describing routine operation as well as emergency response. The new documentation is used to assess whether or not the public water suppliers have the capacity to operate the new expanded or altered water systems. This has placed the PWS Section and the public water suppliers in an excellent position to better determine areas of strengths, weaknesses, challenges and opportunities. This information helps systems and the PWS Section to be more effective in meeting the challenge of providing safe and reliable public drinking water.

In 2007, the PWS Section continues to maintain success in the Capacity Development Program. In the last eight years we have:

- reduced the number of public water suppliers operating in non-compliance;
- reduced the risk of system expansion without adequate capacity;
- reduced errors in system monitoring and reporting violations;
- increased coordination within the PWS Section; and
- increased the number of systems with complete Operations & Maintenance and Emergency Management Plans.

The PWS Section hopes to continue growing and changing to help public water suppliers meet the need of providing safe drinking water in the State of North Carolina.

II. PROGRAM SETTING: *CAPACITY REQUIREMENTS*

II.A Background

The 1996 federal Safe Drinking Water Act (SDWA) Amendments require withholding 20 percent of a state's Drinking Water State Revolving Fund unless the state created a Capacity Development Program. States needed to obtain the means to ensure that all new community water systems and new non-transient non-community water systems beginning operation after October 1, 1999 demonstrate technical, managerial, and financial capacity with respect to each national primary drinking water regulation in effect, or likely to be in effect, on the date operations start. Each state could develop a unique program to meet its specific needs. The goal of the Capacity Development Program is to require technical, managerial, and financial planning of new community and non-transient non-community water systems to improve the service and sustainability of the systems. 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.

Even before the 1996 SDWA Amendments, North Carolina recognized the importance of public water system Capacity. Historically, the PWS Section found that larger municipal systems were generally well managed, but smaller systems were often lacking essential skills or resources to operate properly. Of the approximately 6,800 regulated public water systems, about 5,900 (88 percent) serve a population of less than 500. The PWS Section saw these systems as having huge needs that were not being adequately addressed.

Table 1 provides figures that show the ability of public water systems in North Carolina to comply with federal and state drinking water regulations. These systems are categorized by type and size of population served. The table shows the total number of systems in each category and the number receiving at least one violation with regard to the maximum permissible level of a contaminant in water delivered by a public water system. FY 2000 is shown for comparison since the Capacity Development Program began in this year. Table 1 also shows the number of systems receiving at least one violation for failure to monitor for required water quality tests for each year over a four-year period. It gives the percentage that these systems represent from the total number of systems in each category. These figures indicate that at least 29 percent of public water systems have had at least one monitoring failure in FY 2007. (This failure could include missing one monthly sample that year. Since a typical system monitors at least monthly and has many required tests, missing a single test over the course of a year is shown as a violation.) These numbers confirm that the vast majority of systems with deficiencies are ones that serve less than 500 people. The data included in Table 1 are also shown in graphical format in Appendix A.

It is important to note that having a monitoring violation does not necessarily equate to unsafe water. Another way of looking at compliance is by determining the number of people served by compliant public water systems. As shown in Table 2, compliance rates based on population served have increased over the last four years, excluding monitoring in FY 2005. The overall increase in compliance levels from FY 2003 through FY 2007 can be attributed to: (1) successful Capacity Development efforts and subsequent system compliance; and (2) the change of data management programs by the PWS Section.

On-going Capacity Development efforts have enabled compliance levels to increase since FY 2003. Activities such as effective compliance and enforcement, onsite visits, technical assistance and consolidation of "problem" systems with more reliable ones have gradually improved compliance for the last several years. Exceptions to this change were monitoring compliance rates in FY 2005, when systems were strongly impacted by the cyclic occurrence of asbestos monitoring compliance and new drinking water rules such as Stage 1 Disinfectants and Disinfection By-Products Rule, Radionuclide Rule, Interim Enhanced and Long-Term 1 Surface Water Treatment Rules. A history of recent rule implementation is included in Appendix B.

Compliance measures were also affected by the PWS Sections's change from its traditional database management system (FOCUS) to EPA's Safe Drinking Water Information System (SDWIS). For reporting purposes, compliance levels are calculated based on the end of the compliance period for a given contaminant. Compliance levels for the past eight years have been recalculated based on federal violation definitions and federally-defined water system types. Some water systems that were included in previous capacity development reports are "nonpublic" systems (not subject to federal regulation) and are not included in the current report.

Another challenge presented to the PWS Section is maintaining compliance of systems that began operation within the last three years (new systems). As shown in Table 3 and Figures 1 through 6, compliance levels of new systems vary widely. The data gathered suggests that these systems experienced difficulty performing the required monitoring necessary to remain compliant. One study performed by the PWS Section of new system compliance activities indicated that: (1) many owners/operators are confused about monitoring requirements; and (2) the proper number of lead and copper samples are not collected due to rule misinterpretation or misunderstanding. In contrast, Table 4 indicates that new systems as a whole show similar compliance levels with all systems in North Carolina if compared collectively over the last three years. Further investigation is needed to determine why systems that began operation within the last three years have these compliance issues. The PWS Section will continue to explore strategies that will assist new systems to achieve fully compliant operations.

A comparison of Tables 1, 2, and 3 highlights the dilemma the PWS Section faces in working with public water systems in North Carolina. Even though a great majority of the citizens of North Carolina are served by compliant community public water systems, the number of small systems needing improvements in Capacity is also large. This has created a resources challenge for the PWS Section in balancing priorities on efforts that would provide the greatest public benefit as well as assisting the greatest number of systems. As we continue to automate and streamline our compliance processes, our limited resources can be shifted somewhat to better assist small systems.

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

State Fiscal Year*	Population	Community					Non-transient non-community					Transient non-community					TOTALS				
		Systems	MCL	%	MR	%	Systems	MCL	%	MR	%	Systems	MCL	%	MR	%	Systems	MCL	%	MR	%
2000 (baseline)	<500	1780	66	4%	549	31%	549	27	5%	192	35%	4829	276	6%	3129	65%	7158	369	5%	3870	54%
	500-9,999	667	9	1%	198	30%	119	1	1%	33	28%	75	2	3%	29	39%	861	12	1%	260	30%
	10,000-49,999	94	4	4%	25	27%											94	4	4%	25	27%
	>50,000	26	1	4%	3	12%											26	1	4%	3	12%
	Totals	**2567**	**80**	**3%**	**775**	**30%**	**668**	**28**	**4%**	**225**	**34%**	**4904**	**278**	**6%**	**3158**	**64%**	**8139**	**386**	**5%**	**4158**	**51%**
2004	<500	1672	96	6%	523	31%	463	26	6%	219	47%	4263	274	6%	1813	43%	6398	396	6%	2555	40%
	500-9,999	659	40	6%	175	27%	98	2	2%	45	46%	65	2	3%	23	35%	822	44	5%	243	30%
	10,000-49,999	91	15	16%	19	21%											91	15	16%	19	21%
	>50,000	26	2	8%	5	19%											26	2	8%	5	19%
	Totals	**2448**	**153**	**6%**	**722**	**29%**	**561**	**28**	**5%**	**264**	**47%**	**4328**	**276**	**6%**	**1836**	**42%**	**7337**	**457**	**6%**	**2822**	**38%**
2005	<500	1555	111	7%	526	34%	454	26	6%	174	38%	4112	303	7%	1574	38%	6121	440	7%	2274	37%
	500-9,999	509	85	17%	165	32%	93	2	2%	33	35%	66	7	11%	20	30%	668	94	14%	218	33%
	10,000-49,999	91	11	12%	19	21%											91	11	12%	19	21%
	>50,000	26	3	12%	6	23%											26	3	12%	6	23%
	Totals	**2181**	**210**	**10%**	**716**	**33%**	**547**	**28**	**5%**	**207**	**38%**	**4178**	**310**	**7%**	**1594**	**38%**	**6906**	**548**	**8%**	**2517**	**36%**
2006	<500	1553	77	5%	382	25%	430	18	4%	140	33%	3990	211	5%	1409	35%	5973	306	5%	1931	32%
	500-9,999	506	76	15%	132	26%	95	5	5%	36	38%	63	2	3%	11	17%	664	83	13%	179	27%
	10,000-49,999	89	8	9%	25	28%											89	8	9%	25	28%
	>50,000	26	2	8%	4	15%											26	2	8%	4	15%
	Totals	**2174**	**163**	**7%**	**543**	**25%**	**525**	**23**	**4%**	**176**	**34%**	**4053**	**213**	**5%**	**1420**	**35%**	**6752**	**399**	**6%**	**2139**	**32%**
2007	<500	1545	78	5%	403	26%	414	15	4%	125	30%	3901	206	5%	1263	32%	5860	299	5%	1791	31%
	500-9,999	499	61	12%	110	22%	89	1	1%	24	27%	56	3	5%	12	21%	644	65	10%	146	23%
	10,000-49,999	89	10	11%	11	12%											89	10	11%	11	12%
	>50,000	26	2	8%	4	15%											26	2	8%	4	15%
	Totals	**2159**	**151**	**7%**	**528**	**24%**	**503**	**16**	**3%**	**149**	**30%**	**3957**	**209**	**5%**	**1275**	**32%**	**6619**	**376**	**6%**	**1952**	**29%**

* Data were generated from the SDWIS database. Data in previous reports were generated from the legacy 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. The legacy database did not maintain a record of historical population of a water system and violation data for FY 2000-FY 2005 are reported based on the single population of record. Data entered into the SDWIS database on or after October 1, 2005 includes a record of populations. Violation data for FY 2006 and FY 2007 are reported based on the latest population reported for the fiscal year.

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

§ *"MCL"* means a violation with regards to 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.

(Footnotes continued on page 5.)

(Footnotes continued from page 4.)
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.

The high percentages of systems with MR violations (Table 1) are largely due to the fact that 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 over 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 over 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.

Table 2: Population Served by Compliant Community Public Water Systems

Compliance Measures	State FY 2000 (Baseline)		State FY 2004		State FY 2005		State FY 2006		State FY 2007	
	Population±	Percent	Population	Percent	Population∫	Percent	Population	Percent	Population	Percent
Citizens served by Community Public Water Systems having no MCL* violations	6,546,619	98.3%	6,102,988	91.4%	5,029,772	79.4%	6,131,848	92.8%	6,465,558	92.9%
Citizens served by Community Public Water Systems having no MR† violations	5,461,720	82.0%	5,209,591	78.0%	4,506,244	71.1%	5,085,419	76.9%	5,865,451	84.2%
Total Service Population	6,658,550		6,679,048		6,338,618		6,610,912		6,962,091	

* *"MCL"* means a violation with regards to the maximum permissible contaminant level 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 and for FY 2002 through FY 2005 includes systems that failed to report on time.
± The legacy database did not maintain a record of historical population of a water system and violation data for FY 2000-FY 2005 are reported based on the single population of record. Data entered into the SDWIS database on or after October 1, 2005 includes a record of populations. Violation data for FY 2006 and FY 2007 are reported based on the latest population reported for the fiscal year.
∫ In 2005, three large systems received MCL violations that were quickly resolved. The combined population of these three systems exceeds 800,000. Additionally, 6 large systems received MR violations. The combined population of these six systems exceeds 1,000,000.

Table 3: The Number of Public Water Systems Beginning FY 2001 to FY 2007 with Contaminant and Monitoring Violations

System Begins (State Fiscal Year)	Compliance Period (State Fiscal 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	%
2001	2001	89	56%	2	2%	17	19%	16	88%	0	0%	7	44%	229	96%	3	1%	74	32%	334	85%	5	1%	98	29%
	2002	89	56%	4	4%	14	16%	16	88%	0	0%	5	31%	226	96%	26	12%	131	58%	331	85%	30	9%	150	45%
	2003	85	54%	3	4%	15	18%	11	82%	2	18%	6	55%	211	97%	10	5%	103	49%	307	84%	15	5%	124	40%
	2004	84	55%	2	2%	18	21%	10	80%	1	10%	5	50%	197	96%	12	6%	80	41%	291	84%	15	5%	103	35%
	2005	83	54%	4	5%	9	11%	10	80%	0	0%	3	30%	185	96%	11	6%	61	33%	278	83%	15	5%	73	26%
	2006	34	88%	4	12%	8	24%	9	78%	0	0%	3	33%	173	96%	11	6%	43	25%	216	94%	15	7%	54	25%
	2007	34	88%	4	12%	10	29%	9	78%	1	11%	4	44%	158	96%	9	6%	44	28%	201	94%	14	7%	58	29%
2002	2002	90	70%	0	0%	6	7%	27	96%	1	4%	12	44%	235	99%	12	5%	148	63%	352	91%	13	4%	166	47%
	2003	85	69%	0	0%	26	31%	26	96%	2	8%	16	62%	224	99%	18	8%	130	58%	335	91%	20	6%	172	51%
	2004	84	69%	0	0%	24	29%	23	96%	1	4%	12	52%	209	100%	12	6%	106	51%	316	91%	13	4%	142	45%
	2005	81	69%	2	2%	6	7%	22	95%	1	5%	10	45%	194	99%	10	5%	72	37%	297	91%	13	4%	88	30%
	2006	42	81%	2	5%	4	10%	21	95%	1	5%	8	38%	182	99%	10	5%	62	34%	245	96%	13	5%	74	30%
	2007	42	81%	2	5%	5	12%	16	94%	0	0%	7	44%	171	99%	8	5%	43	25%	229	96%	10	4%	55	24%
2003	2003	83	70%	1	1%	17	20%	22	100%	3	14%	12	55%	94	100%	5	5%	48	51%	199	87%	9	5%	77	39%
	2004	81	69%	1	1%	17	21%	19	100%	3	16%	10	53%	86	100%	7	8%	49	57%	186	87%	11	6%	76	41%
	2005	79	68%	3	4%	10	13%	16	100%		0%	6	38%	84	100%	5	6%	46	55%	179	86%	8	4%	62	35%
	2006	33	85%	3	9%	4	12%	16	100%		0%	4	25%	82	100%	5	6%	33	40%	131	96%	8	6%	41	31%
	2007	32	88%	3	9%	3	9%	15	100%	1	7%	6	40%	78	100%	1	1%	27	35%	125	97%	5	4%	36	29%
2004	2004	39	77%	2	5%	12	31%	11	100%	1	12%	4	36%	95	99%	4	4%	55	58%	145	93%	7	5%	71	49%
	2005	37	76%	5	14%	12	32%	10	100%	1	12%	5	50%	94	99%	2	2%	55	59%	141	93%	8	6%	72	51%
	2006	26	85%	5	19%	4	15%	10	100%	1	12%	5	50%	91	99%	2	2%	32	35%	127	96%	8	6%	41	32%
	2007	26	85%	5	19%	5	19%	10	100%	0	0%	5	50%	86	99%	2	2%	31	36%	122	96%	7	6%	41	34%
2005	2005	82	94%	5	6%	34	41%	8	100%	0	0%	6	75%	78	97%	3	4%	30	38%	168	96%	8	5%	70	42%
	2006	63	94%	5	8%	18	29%	8	100%	0	0%	3	38%	76	97%	3	4%	34	45%	147	96%	8	5%	55	37%
	2007	59	95%	1	2%	33	56%	8	100%	0	0%	3	38%	71	97%	5	7%	31	44%	138	96%	6	4%	67	49%
										0															
2006	2006	36	97%	0	0%	9	25%	13	54%	0	0%	6	46%	74	100%	4	5%	29	39%	123	94%	4	3%	44	36%
	2007	35	97%	4	11%	15	43%	13	54%	1	8%	9	69%	74	100%	7	9%	42	57%	122	94%	12	10%	66	54%
2007	2007	31	94%	0	0%	15	48%	10	100%		0%	6	60%	67	100%	4	6%	27	40%	108	98%	4	4%	48	44%

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

Table 4: Comparison of Public Water Systems Beginning Operation Beginning FY 2005 to FY 2007 and All Public Water Systems Over the Last Three Years with Contaminant and Monitoring Violations

System Begins (State Fiscal Year)	Compliance Period (State Fiscal 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	%
New Systems																									
2005-2007	2005-2007	149	95%	11	7%	75	50%	31	81%	1	3%	25	81%	219	99%	21	10%	133	61%	399	96%	33	8%	233	58%
All Systems																									
2005-2007	2005-2007	2159	72%	333	15%	1092	51%	503	82%	56	11%	344	68%	3957	99%	609	15%	2433	61%	6619	89%	998	15%	3869	58%

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

Figure 1: Community Systems Beginning FY 2001 Through FY 2007 with Contamination

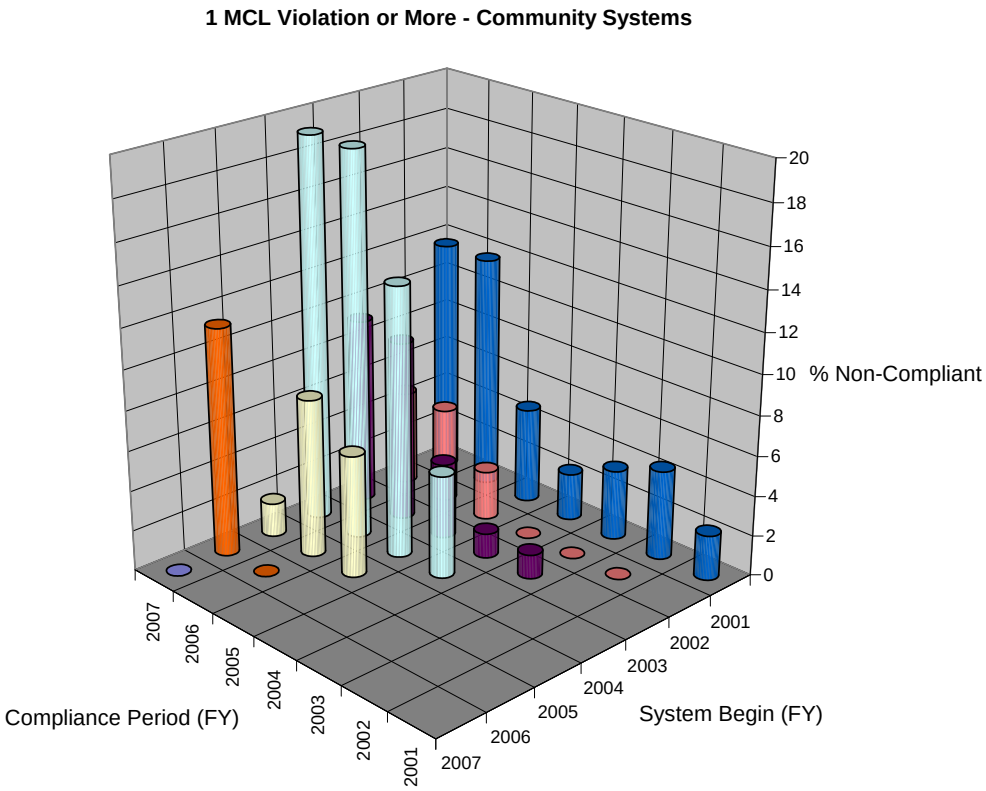


Figure 2: Community Systems Beginning FY 2001 Through FY 2007 with Monitoring Violations

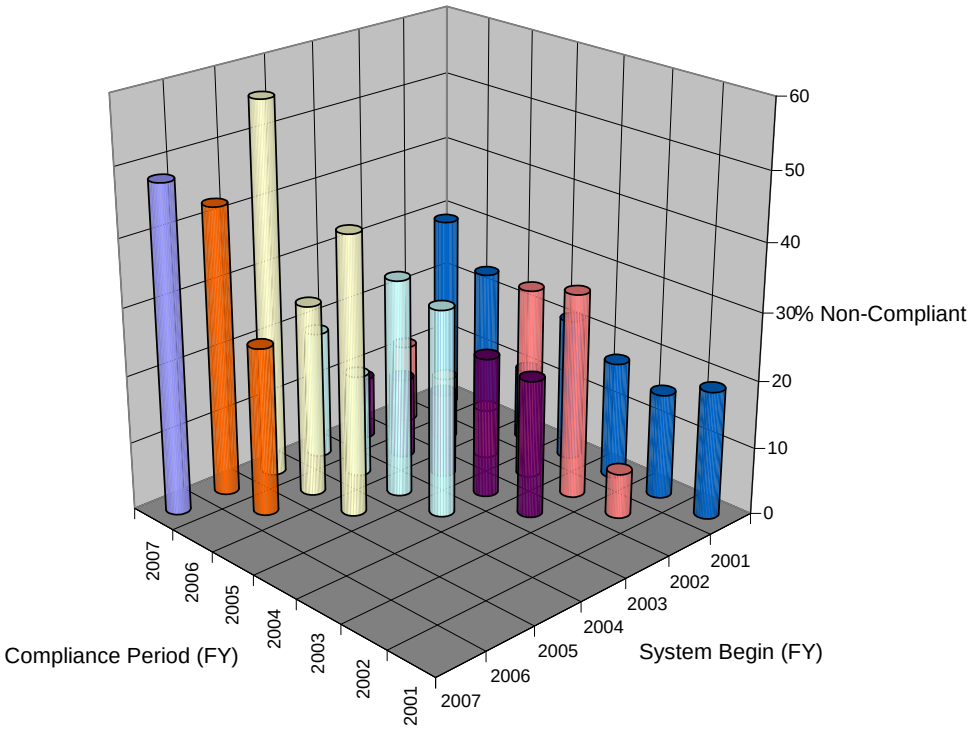


Figure 3: Non-transient non-community Systems Beginning FY 2001 Through FY 2007 with Contamination

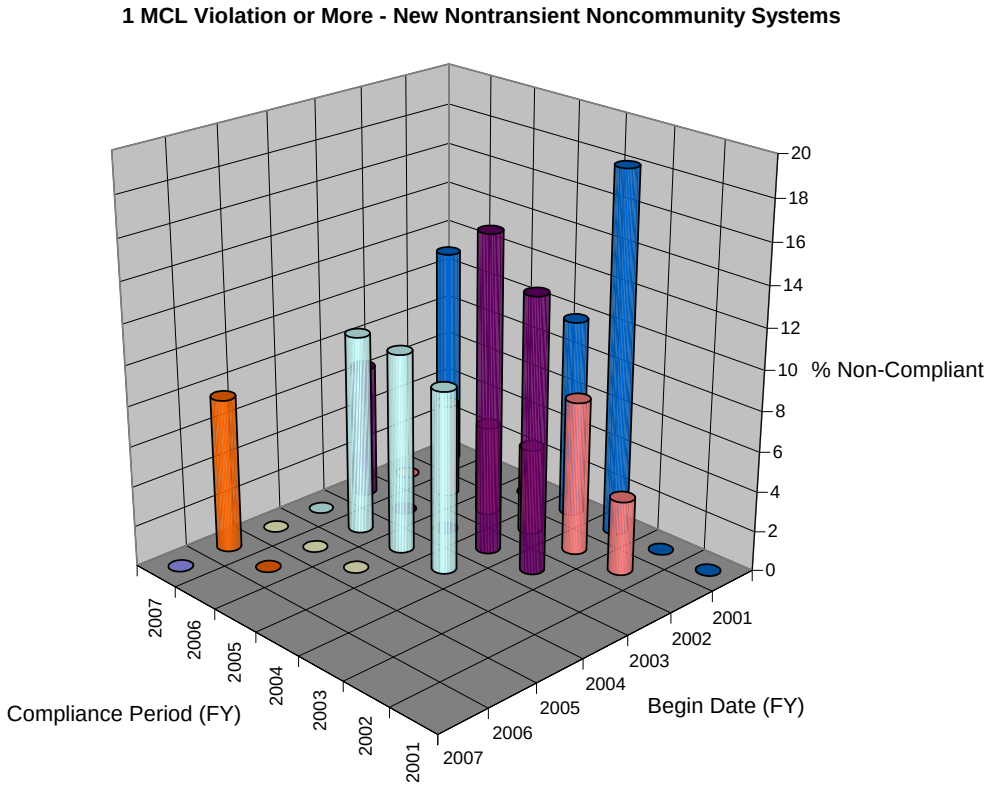


Figure 4: Non-transient non-community Systems Beginning FY 2001 Through FY 2007 with Monitoring Violations

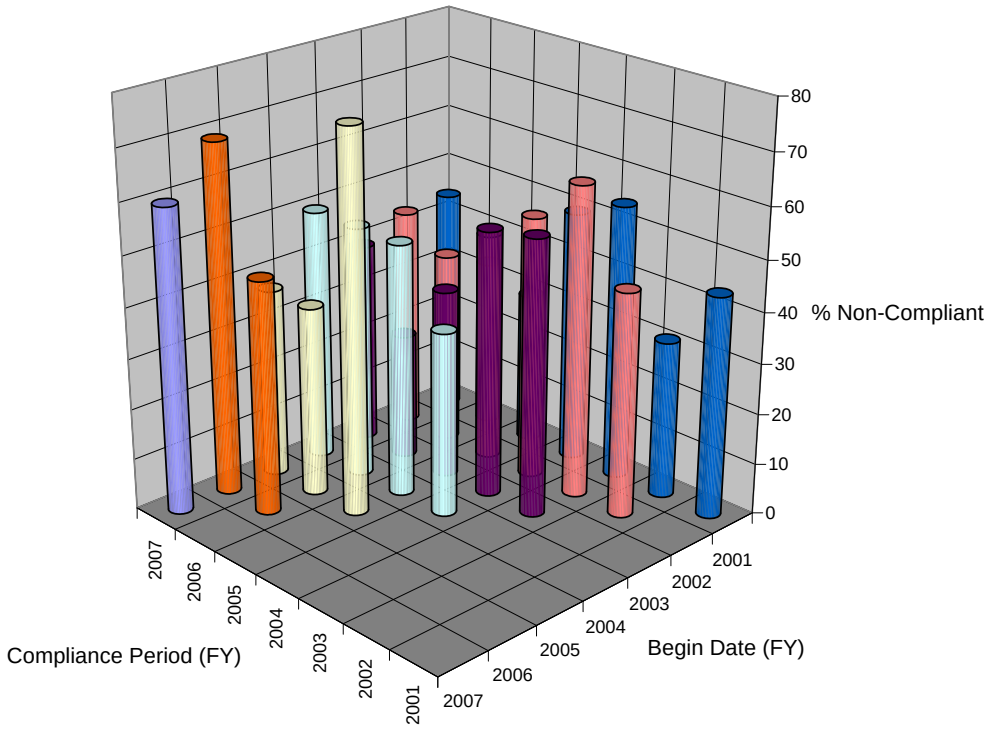


Figure 5: Transient non-community Systems Beginning FY 2001 Through FY 2007 with Contamination

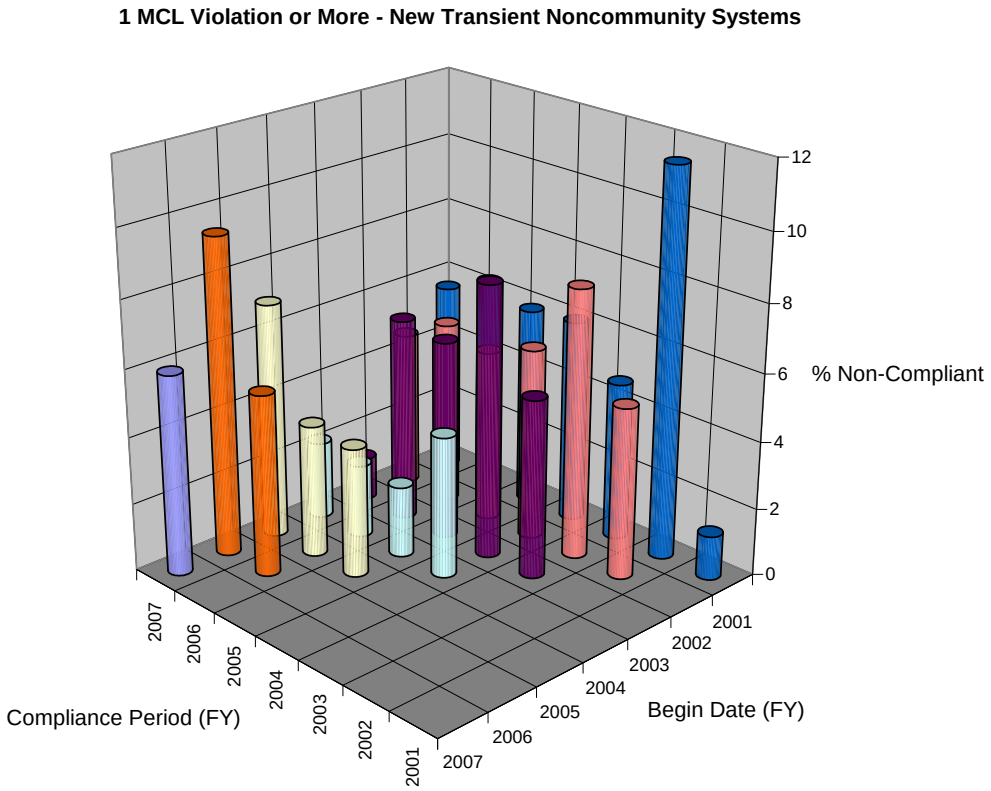
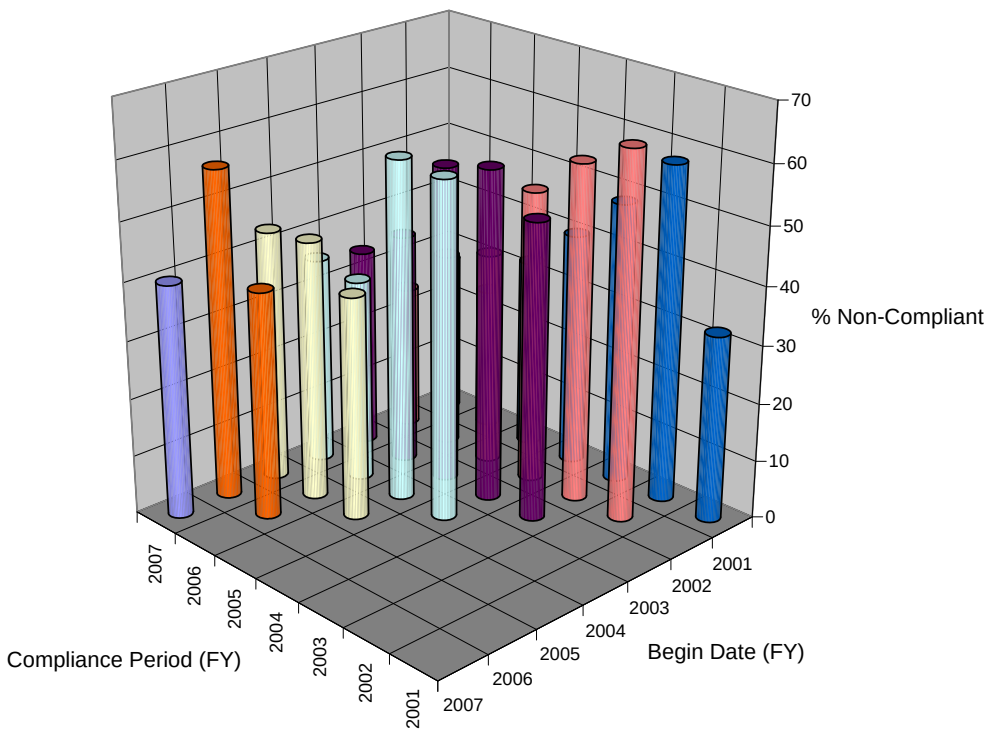


Figure 6: Transient non-community Systems Beginning FY 2001 Through FY 2007 with Monitoring Violations



II.B Program Development

Considering the number of small systems needing improvements in Capacity and the limited resources available, the PWS Section took steps regarding system viability that provided the foundation for a Capacity Development Program. A Viability Stakeholders group was formed in May 1995 to assess the operational needs of public water systems. In 1998, a Capacity Development stakeholder group was convened. From this group the Capacity Development rules evolved with temporary rules in place October 1, 1999. The final rules for the program were adopted August 1, 2000 (NCAC Title 15A, Subchapter 18C, .0300).

A comprehensive strategy was developed and implemented through an effort involving stakeholders, interested parties, sister agencies and PWS Section staff. Due to budgetary constraints, the coordination of this effort was provided by only one added position within the PWS Section as a Capacity Development Engineer. However, the entire section would be involved in implementing the goals of the program.

Training for the Capacity Development Program in April of 2000 included four one-day seminars that were co-sponsored by the PWS Section, the North Carolina Rural Water Association and the North Carolina Section of the American Water Works Association. More than 400 water system managers and operators attended these one-day seminars held in Asheville, Greensboro, Raleigh and Wilmington. The PWS Section also informed community and non-transient non-community water systems of the program through mailings and on its Internet site.

The entire PWS Section staff, both central and field office personnel, has continued to provide the energy and resources to make the Capacity Development Program a success. Several factors have been involved in ensuring the success of the program, including but not limited to the following:

- using an interactive stakeholder process in the adoption of new and revised rules, effective October 1999;
- training PWS Section staff and water system engineers, managers, and operators;
- increasing coordination within the branches of the PWS Section;
- instructing professional engineering organizations involved in plan preparation; and
- enhancing the PWS Section's on-line plan review tracking system.

The PWS Section believes this background continues to provide a strong foundation to ensure that public water systems are receiving the assistance needed to provide safe public drinking water for the citizens of North Carolina.

III. PROGRAM STRATEGY: *CAPACITY OBJECTIVES*

III.A Overview of Strategic Objectives

As reported in August 2000, the PWS Section met the challenge to improve Capacity of public water supply systems in North Carolina by taking a multi-track approach. This was due to the desire by the agency to focus on systems that were in greatest need of assistance. It was also based on budgetary limitations that would necessitate the PWS Section to center its efforts on improvements to systems that would provide the greatest public benefit.

One tool the PWS Section developed to make determinations regarding the Capacity of public water systems is the Water System Management Plan. This plan is a self-evaluation by a system of its Capacity. The plan is required for all new, altered or expanding community and non-transient non-community systems. The Water System Management Plan provides opportunity to evaluate and report on:

- ownership of the public water system;
- contractual arrangements regarding operation or interconnections;
- management structure, qualifications, and training;
- policies regarding the operation of the system; and
- financial information ensuring the continued viability of the system.

These considerations led the PWS Section to adopt the following strategic objectives:

A.1 New, Altered or Expanding Systems: The PWS Section recognized the difficulty of improving Capacity of a public water system **after** construction of a system had already taken place. In addition, systems that are changing their condition may be at greater risk of failure if proper planning and preparation is not done. Therefore, the PWS Section chose a strategy based on the requirement that all new and expanding community and non-transient non-community systems demonstrate Capacity **before** construction. The comprehensive requirements specified by the revised *Rules Governing Public Water Systems* now include the historical approval of engineering plans and specifications as well as certification that the following have been prepared:

- Water System Management Plan;
- Operation and Maintenance Plan (not submitted); and
- Emergency Management Plan (not submitted).

A.2 Existing Systems: On July 1, 2007, the state regulated 2,157 community systems, 504 nontransient, noncommunity systems, and 3,971 transient systems, and 120 water systems not recognized by federal regulations. There are a total of 6,752 regulated public water systems in North Carolina, 88 percent of which serve populations of less than 500 people. With regard to existing public water systems, the PWS Section realized that it had a well-established program that could identify and prioritize systems in need of improved Capacity. The PWS Section expects that focusing on candidates identified from these sources would provide the most benefit to existing systems in greatest need of improving Capacity. Determination for the type of assistance would be done on a case-by-case basis. The PWS Section expects that the Water System Management Plan will be another extremely useful tool in clarifying the causes of non-compliance. Systems could be identified from:

- US Environmental Protection Agency's (EPA) significant non-compliance list;
- sanitary surveys and technical assistance; and
- administrative penalties.

A.3 Improving Coordination*:* The PWS Section recognized opportunities among its own branches and programs to improve coordination in an effort to make the Capacity Development Program more successful. There has been a concerted effort to better coordinate internal activities in order to improve the efficiency of many of the regulatory functions. The Capacity Development Program is being used as the fulcrum in providing the leverage to implement some of these changes, as is highlighted in Section III.B.3 of this report.

III.B Efficacy of Strategies

The following is a discussion on the effectiveness of the strategies the PWS Section has implemented to improve the Capacity of public water systems.

B.1 Strategy Efficacy - New, Altered or Expanding Systems

The plan review process was revised to accommodate the new Capacity Development Program. The following procedure is now in place to ensure that the Capacity of public water suppliers exists before construction:

- The applicant submits an Engineer's Report, engineering plans and specifications, and a Water System Management Plan;
- If the Engineer's Report is complete and the engineering plans and specifications meet all requirements, the PWS Section approves engineering plans and specifications;
- When, in addition to having approved plans and specifications, the PWS Section determines that the Water System Management Plan is complete, the PWS Section issues an Authorization to Construct letter and the system begins construction;
- The applicant prepares or updates an Operation & Maintenance Plan and an Emergency Management Plan for the system;
- The applicant submits an Engineer's Certification and an Applicant Certification;
- The PWS Section issues a final approval letter; and
- The new construction, alteration or expansion project is placed into service.

The approach that the PWS Section has taken in promoting Capacity development has proven to be quite effective. Requiring the submission of a complete Water System Management Plan for review as part of the plan approval process ensures that any new or expanding public water system is demonstrating the Capacity necessary to operate viably. Starting from the adoption of the rules in October 1999 through June 2007, the PWS Section has accepted Water System Management Plans for 1,550 public water systems. To reduce the administrative burden on the owners of public water systems, the capacity development rules allow a single Water System Management Plan for multiple systems owned by the same person or legal entity.

During the approval process, a new or expanding public water system is also required to submit an Applicant Certification. This document certifies that the owner has developed an Operation and Maintenance Plan, an Emergency Management Plan, and has an appropriately licensed operator acting as the Operator in Responsible Charge (ORC). This certification step in the approval process has accomplished a great deal in developing Capacity. It has allowed systems to exhibit the requirements of operating and maintaining the system before it is available for public use. It also allows systems to provide the forethought of managing emergency or disaster events concerning the public water system. With this requirement, the PWS Section is building a strong foundation regarding recent security concerns and has provided a good starting point for systems to meet federal requirements for disaster preparedness for public water systems.

B.2 Strategy Efficacy - Existing Systems

The PWS Section has started to identify systems using information generated from program activities throughout the Section. The systems in greatest need of improving their Capacity based on performance with respect to their compliance with state and federal monitoring requirements for water quality testing are identified using information available within the PWS Section.

Annual Monitoring Status and Sampling Schedule Report: Since 1999, the PWS Section has been making available the Monitoring Status and Sampling Schedule Report. This report was posted on the PWS Section's Internet web site through the end of 2005. It provided the latest information on compliance and sampling dates. It also provided information on the frequency of testing and codes used in reporting. This information helped systems collect samples properly and receive credit for those samples, thereby reducing a frequent source of past errors for the systems. System officials could verify this information and report back any discrepancies. This has greatly assisted the section in avoiding unnecessary monitoring and reporting violations. Through the first half of FY 2006, drinking water data was migrated to the Safe Drinking Water Information System (SDWIS). At the beginning of FY 2007, Drinking Water Watch was made available to replace the Monitoring Status and Sampling Report.

Compliance Inspection Report: The PWS Section developed a Compliance Inspection Report to be used during site visits by agency staff. These reports may be used to document that the system is in compliance with the *Rules Governing Public Water Systems* or may serve as a field-generated Notice of Violation. This report has been in use since July 2000 and has improved the efficiency of communicating systems deficiencies to owners and operators, as well as reducing the requirement of formal letter generation, thus saving resources.

Technical Assistance from the North Carolina Rural Water Association: The PWS Section has a contractual agreement with the Rural Water Association to provide technical assistance to small water systems (less than 10,000 people) through a circuit rider. This circuit rider receives system referrals from the PWS Section as well as requests for assistance from other sources. During FY 2007, the circuit rider assisted 154 systems with issues such as compliance and treatment, operation and maintenance, water loss and leak detection, management techniques, and emergency response. The North Carolina Rural Water Association has also jointly sponsored four workshops with the PWS Section during FY 2007 to help small systems meet new regulations.

List of Significant Noncomplier Systems: The United States Environmental Protection Agency's list of water systems in significant non-compliance is being used to determine systems that may benefit from the Capacity Development Program. The PWS Section has established the Capacity Development Committee to improve the PWS Section's capacity to provide timely and appropriate enforcement actions that incorporates the review of water systems in significant non-compliance and develops strategies to return systems to compliance.

Administrative Penalties: The PWS Section has an established enforcement program for issuing Administrative Orders and Administrative Penalties to public water systems that violate the *Rules Governing Public Water Systems*. The consequence for continued non-compliance has been assessment of a penalty. Through FY 2006, the Compliance Services Branch of the PWS Section has been issuing consolidated penalties that address monitoring deficiencies for all contaminant groups for systems that are considered "Significant Non-Compliers." Consolidation of penalties has allowed the PWS Section to assess a total fine to systems for multiple drinking water enforcement issues. This approach has better utilized PWS Section's enforcement capabilities and provided comprehensive enforcement for systems with persistent drinking water problems.

Beginning in FY 2007, the Compliance Services Branch has accelerated its enforcement procedures. For monitoring violations, penalties quickly follow notices of violation issued for each contaminant group and each compliance period. For maximum contaminant level (MCL) violations, a combination notice of violation/administrative order is initially issued with a compliance deadline specified. Follow-up notices of violation are issued each compliance period that the system exceeds the MCL. Failure of a system to comply with the conditions in the administrative order within reasonable timeframes will result in the issuance of an administrative penalty.

During FY 2006, 425 Administrative Orders and 247 Administrative Penalties were issued to systems. Approximately $79,868 was assessed during FY 2007 and about $80,148 was collected on penalties assessed during FY 2007 and previous years. The PWS Section has also included the Water System Management Plan as a mediation option when negotiating the settlement of an administrative penalty between the PWS Section and the non-compliant public water system. With this option, the owner of the system would describe specific managerial and/or financial plans to be implemented to ensure future compliance with the *Rules Governing Public Water Systems.*

B.3 Strategy Efficacy – Improving Coordination

The following highlights how the associated programs and initiatives within the PWS Section are being used in coordination with the Capacity Development Program.

Technical Assistance to Small Water Systems: The Safe Drinking Water Act has added tremendously to the responsibilities and workload of public water system personnel. All areas of water system operation have increased in complexity. Water system officials have called on the state for assistance more than ever before. The result is limited technical assistance available to the water systems. During FY 2007, approximately 57 field personnel provided technical assistance to systems during 7,282 on-site contacts, 2,251 of which were sanitary surveys.

Transient non-community Water Systems: From the inception of the Safe Drinking Water Act in 1974, the very small transient non-community water systems have been a concern of Congress. Examples of the transient water systems include churches, gas stations, restaurants, highway rest stops, and state parks. For states with large numbers of transient systems such as North Carolina, funding was not provided to adequately address the transient water system problem. For years, North Carolina implemented the drinking water program in accordance with the "Priorities Guidance" from EPA, which focused the limited program resources available on the most significant issues leaving little time for oversight of the transient water systems. The State Revolving Fund set aside for State Program Management now provides North Carolina with the opportunity to initiate oversight and enforcement activities of the transient systems to include:

- identifying transient non-community water systems not on inventory;
- verifying and maintaining the transient non-community water system inventory;
- performing initial sanitary surveys and follow-up surveys every 10 years;
- conducting compliance and enforcement work including automated violation letters;
- issuing boil water notices and performing follow-up actions; and
- providing technical assistance.

One staff position has been created in the central office and staff positions have been created in each regional office to monitor and assist transient systems. Central office activities include inventory coordination and updating, training and regulatory consultation to system owners and operators, compliance and enforcement activities, and development and oversight of related computer programming. Additional duties in the regional offices include:

- providing on-site technical assistance;
- providing transient non-community inventory updates, site visits and consultation as follow-ups to contamination;
- conducting sanitary surveys;
- issuing boil water notices;
- assisting with public notice of contamination; and
- providing training.

During FY 2006, 2,475 site visits were performed. In addition to transient system work, some technical assistance activity was performed for all other types of public water systems. While much progress has been made and compliance improvements have been the result, there are still insufficient resources at the PWS Section to respond to the needs of systems with on-site assistance, such as water quality test results showing bacterial contamination (which may indicate a serious health risk). Recent statutory increases to the operating permit fee structure will phase in through FY 2008. The additional staff resources provided will allow significant progress to be made on these issues in the future.

Compliance Services Branch Initiatives: The Compliance Services Branch of the PWS Section has developed several initiatives that complement the goals of the Capacity Development Program. They have been aimed at improving the efficiency of compliance reporting requirements of public water systems. The initiatives are also improving the issuance and tracking of enforcement activities, as well as the overall administration of the PWS Section's compliance program. These initiatives include:

- sending letters and sample schedules explaining monitoring requirements to all new systems;
- placing public notices on the PWS Section website;
- preparing and distributing annual "Regulatory Updates" to each water system by type;
- standardizing laboratory reporting forms (including training and workshops for laboratories);
- mailing unsatisfactory analyses back to laboratories and supplying copies to the North Carolina Laboratory Certification Program;
- continually clarifying and revising enforcement letters (Notices of Violation, Administrative Orders and Administrative Penalties) and using standardized templates for their ease of preparation;
- creating new staff positions to perform database queries that more closely track systems with violations;
- including required forms for public notification as attachments to violation letters;
- enforcing non-compliance more strictly;
- improving the tracking and follow-up of contaminant violations by carefully reviewing remedial plans submitted by water systems;
- incorporating remedial plans and public notices into enforcement proceedings;
- automating daily identification of public water systems exceeding bacteriological and nitrate/nitrite contaminant violations and weekly identification of those systems required to increase monitoring due to detection(s) of volatile organic compounds, synthetic organic compounds, inorganics, and nitrates/nitrites;
- developing contact protocols for interaction with sister agencies such as Children's Environmental Health and Dairy and Food Protection Branches

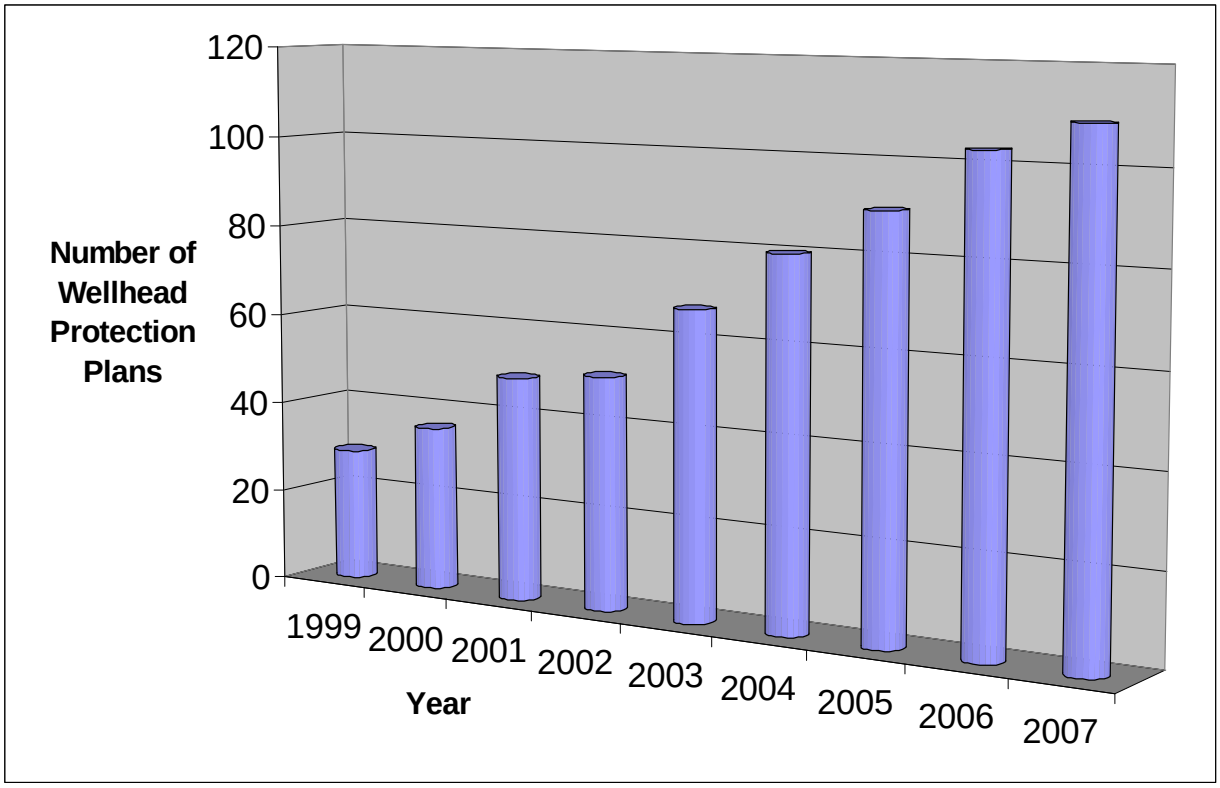
North Carolina's Source Water Program: The PWS Section continued to improve and implement items in accordance with North Carolina's approved Source Water Assessment Program (SWAP). Source Water Assessment Program reports continue to be refined and are available to the public using the PWS Section's geographic information application, SWAPinfo (http://www.deh.enr.state.nc.us/pws/swap). The reports on this website provide information that can be used by public water system owners, operators, local governments, volunteer organizations, and citizens to develop and implement source water protection strategies. The results of SWAP, along with voluntary source water protection activities, will enhance the capacity of public water systems to meet safe drinking water standards.

The Source Water Protection Program is designed to promote efforts at the local level that result in the creation of source water protection plans for surface water sources. Technical assistance is available to any public water provider wishing to develop a source water protection plan. Additional information, including a newly published guidance document, is available on the PWS Section website.

Currently, three public water providers using surface water sources have initiated efforts to develop a source water protection plan. These systems will serve as pilot programs. These three water providers serve a population exceeding 202,000 people. The first surface water protection plan was submitted for review and approval in June 2007. With the assistance of the North Carolina Rural Water Association, a group of water systems in Western North Carolina have initiated a collaborative source water protection plan encompassing a four-county area. As more public water providers join SWAP, there is potential to greatly improve the capacity of public water systems that derive their raw water from a surface source.

North Carolina's Wellhead Protection Program: The Wellhead Protection Program is a pollution prevention and management program used to protect underground sources of drinking water. In North Carolina, development of a local Wellhead Protection Plan is not mandatory, but is viewed as a valuable supplement to state groundwater protection programs. North Carolina's Wellhead Protection Program is intended for city and county governments and water supply owners that wish to provide added protection to their local groundwater supplies. The Wellhead Protection Plan, once implemented, reduces (but does not eliminate) the susceptibility of wells to contaminants. Figure 7 highlights the success of this program.

Figure 7: Cumulative Wellhead Protection Plan Approvals



Since the beginning of the program, the PWS Section has received 157 local wellhead protection plans submitted for review and approval. Of these 157 plans, 109 have received approval. The majority of the remaining plans are under active review. Active review includes generating review letters requesting additional information and/or clarification regarding the information submitted with the local Wellhead Protection plans, as well as attending numerous meetings with the parties involved in the plan development. The 109 systems with approved well head protection plans comprise 536 public water supply wells serving approximately 539,092 people. It is expected that these plans will assist greatly in improving the Capacity of public water systems in North Carolina. Through the Drinking Water State Revolving Fund, the state provides funding to the North Carolina Rural Water Association for two positions to assist local governments in the development of these plans.

Operator Certification and Training: The State of North Carolina has approximately 4,502 certified water system operators who possess approximately 6,143 active operator certifications. North Carolina is responding to the need to provide certification and training to these operators by providing an active certification program. A network of volunteer and member organizations conducts the program. The PWS Section together with the North Carolina Waterworks Operators Association (NCWOA), the North Carolina Rural Water Association, and the North Carolina American Water Works Association coordinate schools, seminars, workshops, and conferences. This program has successfully increased the capacity of public water systems by directly influencing the training and certification provided public

water system operators. Through the Expenditure Reimbursement Grant from EPA, the state provides funding to the NCWOA for a training coordinator position.

IV. PROGRAM SUCCESS: *CAPACITY IMPROVEMENTS*

IV.A Indicators for Measuring Capacity Improvement

The August 2000 report, "North Carolina's Capacity Development Strategy for Existing Public Water Systems," discussed indicators the PWS Section is using to determine the progress of its Capacity Development Program as follows:

> "The primary component of North Carolina's capacity development program is 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 plans to use existing databases to track the following information for public water systems:
>
> - Number of public water systems with approved plans and specifications;
> - Number of public water systems with a complete Water System Management Plan (WSMP);
> - Number of public water system projects with a submitted Engineer's Certification to document that the system is constructed in accordance with approved plans and specifications;
> - Number of public water system projects with an Applicant Certification to document that the system has an Operation and Maintenance Plan and an Emergency Management Plan; and
> - Number of Public Water Supply systems that have an appropriate certified operator in responsible charge.
>
> The above information, in addition to compliance information will be used to measure improvements in capacity.
>
> Also, the PWS Section will track the number of water supply intakes with complete Wellhead Protection Plans and/or Source Water Assessments as a measure of improved capacity."

The PWS Section has therefore adopted the following approach in determining the effectiveness of the Capacity Development Program:

- *Progress*: Progress in the Capacity Development Program is defined as improving the technical, managerial, and financial viability of an increasing number of public water systems;
- *Measuring Progress*: Measuring progress will be accomplished by tracking the number of public water systems that have completed the requirements of the Capacity Development Program as specified in the rules;
- *Benchmark Figures*: The benchmark figures against which this progress is to be measured are the completion rates of the program requirements of the first period of the program (October 1, 1999 to June 30, 2000). The goal of each year is to surpass the completion rate of the previous year. It is expected that an ever-increasing number of public water systems will have completed the requirements of the program.

Supporting activities for Capacity development include Compliance and Enforcement, Wellhead Protection Plans and Source Water Assessments. The PWS Section is looking at ways in which information from these activities can be used to enhance the Capacities of regulated water systems.

IV.B Current Status: Facts and Figures

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

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**	
		#	%	#	%	#	%	#	%	#	%	#	%
June 30, 2000	3,316	427	12.9	334	10.1	571	17.2	60	1.8	5	0.2	6	0.2
June 30, 2001	3,208	674	21.0	581	18.1	999	31.1	235	7.3	64	2.0	77	2.4
June 30, 2002	3,107	831	26.7	718	23.1	1103	35.5	425	13.7	138	4.4	140	4.5
June 30, 2003	2,935	985	33.6	838	28.6	1275	43.4	556	18.9	258	8.8	252	8.6
June 30, 2004	2,913	1,131	38.8	949	32.6	1352	46.4	667	22.9	369	12.7	358	12.3
June 30, 2005	2,912	1,263	43.4	1,077	37.0	1438	49.4	793	27.2	504	17.3	510	17.5
June 30, 2006	2,877	1,364	47.4	1,171	40.7	1506	52.3	896	31.1	626	21.8	644	22.4
June 30, 2007	2,738	1,437	52.5	1,250	45.7	1550	56.6	1,034	37.8	943	34.4	910	33.2
Increase from 1st period†		1010	39.6	916	35.6	979‡	39.4	974	36.0	938	34.3	904	33.1

*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 fiscal 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 which receive this authorization are not constructed.

† % value indicates the increase in the percentage of public water systems that have completed the particular capacity development measure indicated since the 1st period (October 1, 1999 through June 30, 2000).

‡ 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.

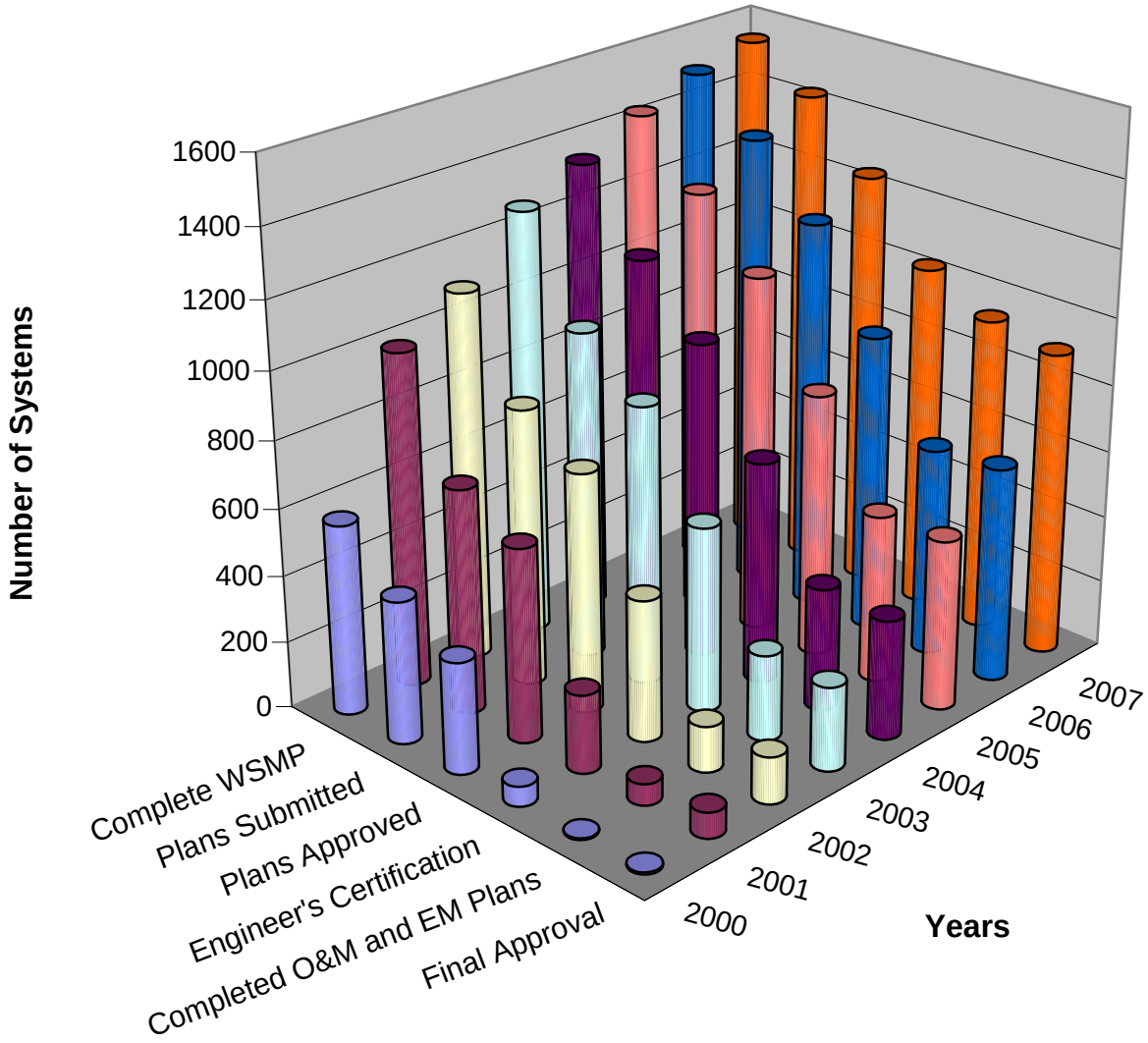
"*Systems with O&M and EM Plans"* means the number of systems having at least one applicant certification during the indicated period that a project had an operation and maintenance plan and an emergency management plan..

"*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.

Table 5 is summarized graphically in Figure 8 in order to illustrate the number of systems that have submitted plans to the PWS Section; obtained plan approval; and have developed Water System Management Plans, Operation & Maintenance Plans, and Emergency Management Plans; and have received final approval for projects.

Currently, the individual plan review engineer checks plan submittals to ensure a current Water System Management Plan is on file or is being submitted with the application. In the later case, the plan review engineer reviews the Water System Management Plans for completeness.

Figure 8: Capacity Development Measures



"*WSMP*" indicates the documentation of the Water System Management Plan.
"*O&M Plan*" indicates Certification of the completion of an Operation and Maintenance Plan
"*EM Plan*" indicates Certification regarding the completion of an Emergency Management Plan
"*Final Approval*" indicates the completion of the requirements of the Capacity Development Program.

IV.C Discussion of Progress

As demonstrated in Figure 8, the Capacity Development Program has allowed the PWS Section to make steady progress in assuring that an increasing number of public water systems have evaluated their Capacity. Since 1999, over 1,300 systems entered the plan evaluation process with a total of 598 of these systems completing all of the requirements necessary to reach final approval status. Approximately 1,550 systems are covered by a WSMP self-assessment deemed satisfactory by the State. Multiple systems under single ownership, including those not expanding, may be covered by one master WSMP. As measured against the benchmark of the initial period, there has been a 170 percent increase in the number of public water systems with complete Water System Management Plans. Each year, more systems complete the Capacity Development Program. However, many systems that began the plan evaluation process have not achieved final approval status. Therefore, the PWS Section has begun developing a process to review the records, identify non-compliant systems and notifying them of their requirements.

Completion of the Capacity Development Program requirements indicates that a public water system has completed Operation & Maintenance and Emergency Management Plans. These plans are not only invaluable tools for the proper maintenance of the system, but they also provide incentive for the system to prepare for emergency and disaster events. With this requirement, the PWS Section built a strong foundation regarding recent security concerns and federal requirements for vulnerability assessments and disaster preparedness for public water systems.

The PWS Section is very pleased with the progress of the Capacity Development Program to date. The numbers show that there has been much effort and activity toward accomplishing the requirements of the program to assist in improving the Capacity of public water systems in North Carolina. The numbers also show that there is much more to do.

V. PROGRAM DIRECTION: *CAPACITY INITIATIVES*

V.A New Challenges and Opportunities

The PWS Section has been able to identify several challenges through the implementation of its Capacity Development Program. The greatest challenge facing the agency is how to identify and assist the individual needs of the smaller public water suppliers (those serving less than 500 people). These small systems are faced with a wide range of hurdles in attaining adequate Capacity as compliant water suppliers. Also, as mentioned previously, the resources necessary for the PWS Section to assist these systems presents a challenge.

The PWS Section wants to provide assistance to all public water systems regardless of size. Some of the opportunities that are available include:

- **Operator Certification**: The United States Environmental Protection Agency's guidelines require that all community and non-transient non-community public water systems be operated by a licensed ORC or risk withholding of 20 percent of the State Revolving Fund Capitalization Grant. This mandate provides an opportunity to improve Capacity for these existing systems. The PWS Section expects the smaller systems to benefit greatly by having trained operators managing these systems. To assist small systems (serving 3,300 persons or less) with resources needed for initial training and continuing education to acquire or maintain certification, the state provides reimbursement for this training through the Expenditure Reimbursement Grant from EPA.

- **Emergency Management**: North Carolina received an initial grant during 2002 and subsequent amendments through federal fiscal year 2007 from the EPA to initiate and maintain state level activities and/or strategies that assist in emergency response and recovery preparedness. The main guidance for the PWS Section work plan activities since 2002 has been the requirements of the Bioterrorism Act of 2002 (P.L.107-188).This act amended the Safe Drinking Water Act by adding Section 1433 which outlined vulnerability assessment and emergency response plan responsibilities for public water systems serving over 3,300 persons.

  The amended grant work plan includes preparation of an emergency response guidance document for responding to intentional contamination incidents directed at public water systems. It will be used primarily for PWS Section staff and other assisting state agency responders. Also guidance is being completed for conducting statewide table top exercises to improve state level responses to harm intended incidents at public water system sites. A 72 page EPA Water Security handbook is available to water system owners and managers at: www.epa.gov/watersecurity under Tools and Technical Assistance - Emergency/Incident Planning.

The Governor's 2005 Proclamation for Adoption of National Incident Management System (NIMS), which includes Incident Command System (ICS) components, calls for all emergency responders to become better prepared for incident management through training and exercises. Completion of on line and in class courses by PWS Section personnel for emergency response preparedness was a primary focus during 2006. Future focus of additional preparedness training for PWS Section technical staff will center upon the Training Guidance, supplied by contract to the PWS Section on July 31, 2007.

The PWS Section was one of three co-hosts for ICS 100 and NIMS 700 training sessions held in North Carolina during the last week of March, 2007. Charlotte Mecklenburg Utilities (CMUD) and the City of Wilmington Water Utilities Department provided training sites and were the other two co-hosts. Summary attendance/participation totals were as follows: CMUD, 2 days, 52 persons; PWS Section, 1 day in Raleigh, 13 persons; and Wilmington, 1 day, 21 persons. EPA provided two instructors through its training contractor, HorsleyWitten.

Members of the PWS Section staff involved in emergency response preparedness and coordination has been participating in seminars, mock table top exercises, workshops and web casts sponsored by the National American Water Works Association (AWWA), the Disaster Preparedness Committee (DPC) of North Carolina Section of the AWWA, EPA, Association of Drinking Water Administrators, and its training and emergency response guidance document contractor, URS Corp.

- **Improved Database Management:** The Public Water Supply Section successfully completed data migration from our traditional data management system (FOCUS) to EPA's Safe Drinking Water Information System (SDWIS) in April 2006, with deployment to the web version in April 2007. Migration to the new environment has improved the Section's capacity by reducing our dependency on the knowledge base of key individuals while at the same time providing increased functionality.

- **Central Coastal Plain Capacity Use Area:** This area, located in Eastern North Carolina, is underlain by Cretaceous aquifers that are threatened by excessive groundwater withdrawal and by saltwater encroachment. Systems that withdraw more than 100,000 gallons per day are required to begin curtailing water production by as much as 25 percent by 2008 with future reductions up to 75 percent by 2016. Access to alternative water sources must be developed and funded to meet public demands. Strategies for managing demands while meeting withdrawal reductions include construction of new surface water treatment plants, interconnects with other systems, drought management planning and preparation of water conservation plans. A significant portion of available Drinking Water State Revolving Funds are being allocated to systems meeting these challenges.

- **2007 Infrastructure Needs Survey Strategy:** Water systems make significant investments to construct and manage infrastructure in order to deliver safe drinking water and protect public health. Every four years, EPA with the assistance of states, conducts a survey of the anticipated costs of these investments and reports the results to Congress. The results also determine the amount of funding North Carolina receives for its Drinking Water State Revolving Fund program, which funds the types of projects identified in the survey. Prior to the 2007 Infrastructure Needs Survey, the PWS Section intends to provided information, training, and technical assistance in Capital Finance Planning including management of critical assets. Initially the focus was on large and selected medium sized systems. After completion of the 2007 survey, outreach efforts will include the remainder of the medium systems and small systems as resources allow.

- **Disadvantaged Communities Program:** Many systems, especially small ones, lack the resources needed to provide consistent safe drinking water to the public as required by EPA. This frequently results in long-term non-compliance. The PWS Section has developed a strategy to consolidate "problem" systems with more reliable water suppliers in the immediate vicinity. The pilot for the development of this program was funded by state unanticipated bond grant monies.

- **Development of Capacity Development Assistance Team**: Systems that are recurrent violators remain non-compliant for various reasons. The PWS Section believes that many systems can become compliant with the proper assistance and guidance. To meet this challenge, the Capacity Development Assistance Team has been developed. This group plans to draw resources from all facets of the PWS Section to correct any technical, financial, and/or managerial problem these systems have. Systems that consistently fail to monitor and that do not understand drinking water rules receive comprehensive Capacity Development evaluations with subsequent follow-up by PWS Section field staff. Systems with specific technical or managerial problems receive targeted Capacity Development evaluation and recommendations for operational changes and system upgrades, when appropriate.

- **New System Assistance:** From the current data analysis, systems that began operation within the last three years appear to have highly variable annual compliance levels as well as difficulty complying with monitoring and reporting requirements of *"The Rules Governing Public Water Systems."* Therefore, the PWS Section will continue to investigate new system progress and is considering ways to provide more focused assistance to new systems during their early years of operation. New staff that will be added once the increased operating permit fees are fully implemented will pilot developed procedures.

V.B Future Reports

Section 1420(c)(3) of the 1996 Safe Drinking Water Act Amendments require that:

> *"Not later than 2 years after the date on which a State first adopts a capacity development strategy under this subsection, and every three years thereafter, the head of the State agency that has primary responsibility to carry out this title in the State shall submit to the Governor a report that shall also be available to the public on the efficacy of the strategy and progress made toward improving the technical, managerial, and financial capacity of public water systems in the State."*

The PWS Section must provide the governor of the State of North Carolina with the required report on the dates specified, starting from September 30, 2002 (2005, 2008…), until otherwise notified by EPA. The PWS Section plans to prepare an updated report annually and publish it on its web site at: **http://www.deh.enr.state.nc.us/pws.**

VI. PUBLIC AVAILABILITY OF THE 2007 CAPACITY DEVELOPLMENT REPORT

As required by the EPA, the PWS Section makes this report available to the public. The Internet web page of the PWS Section contains a link to the report. The web page can be found at:

http://www.deh.enr.state.nc.us/pws

This Internet web page also has links to the following supporting documentation and recent reports regarding the Capacity Development Program of the North Carolina PWS Section:

North Carolina's Capacity Development Report for Public Water Systems, September 2006.

North Carolina's Capacity Development Report for Public Water Systems, September 2005.

North Carolina's Capacity Development Report for Public Water Systems, September 2004.

North Carolina's Capacity Development Report for Public Water Systems, September 2003.

North Carolina's Capacity Development Report for Public Water Systems, September 2002.

North Carolina's Capacity Development Strategy Implementation Report, August 2001.

North Carolina's Capacity Development Strategy for Existing Public Water Systems, August 2000.

Appendix A

Figure A.1: Water Systems with MCL Violations, State FY 2007

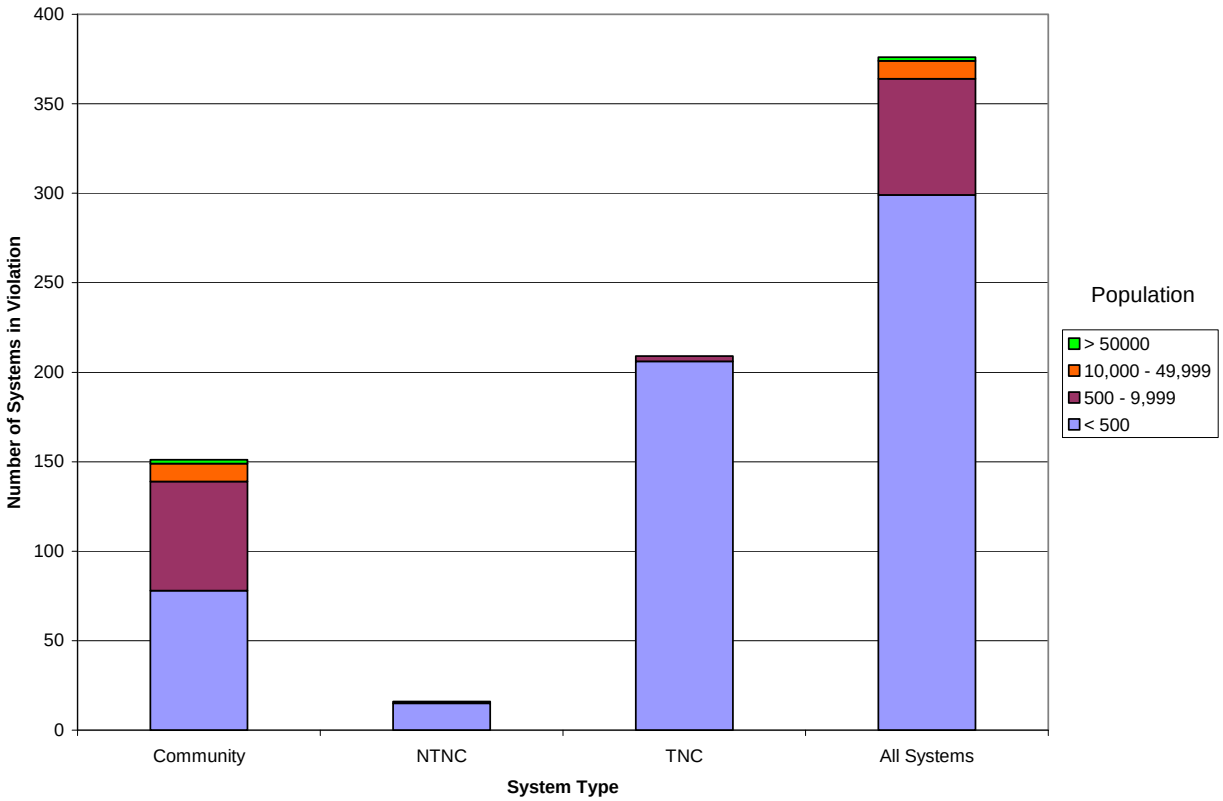


Figure A.2: Water Systems with MR Violations, State FY 2007

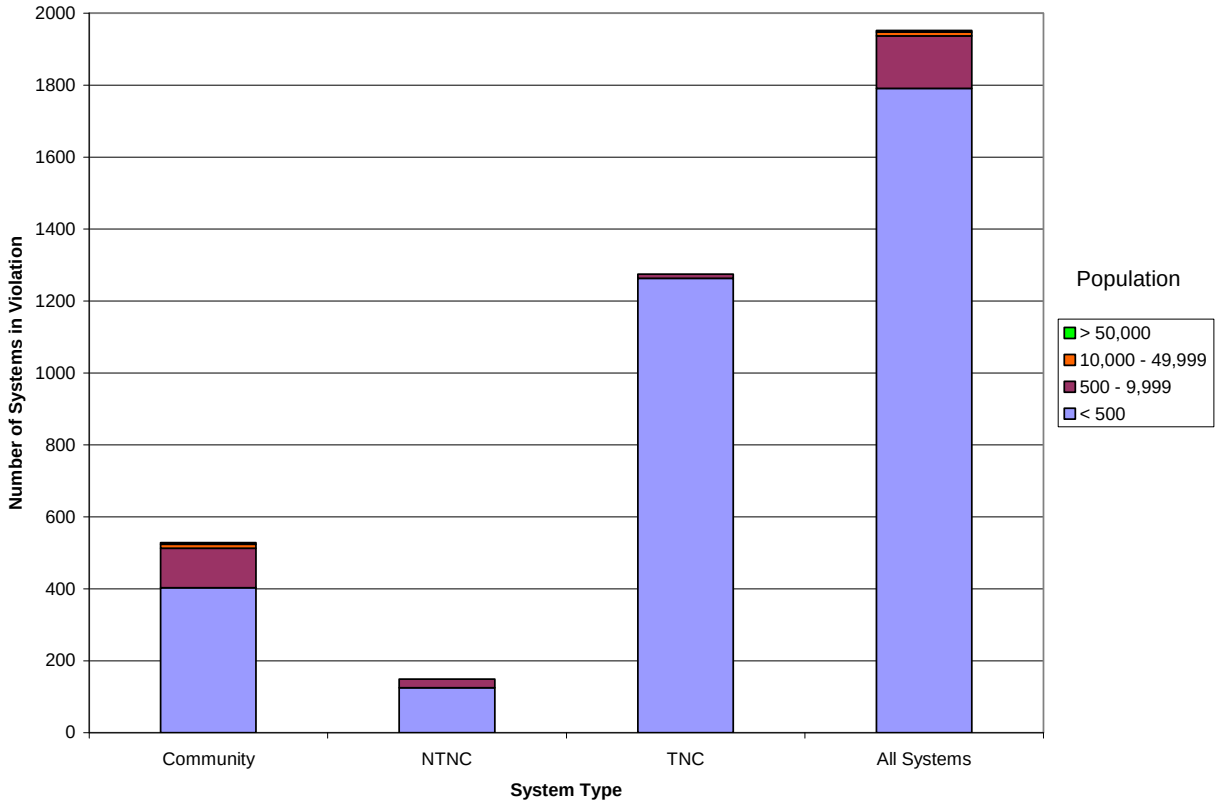


Figure A.3: Water Systems with MCL Violations Since State FY 2000, Grouped by Water System Type

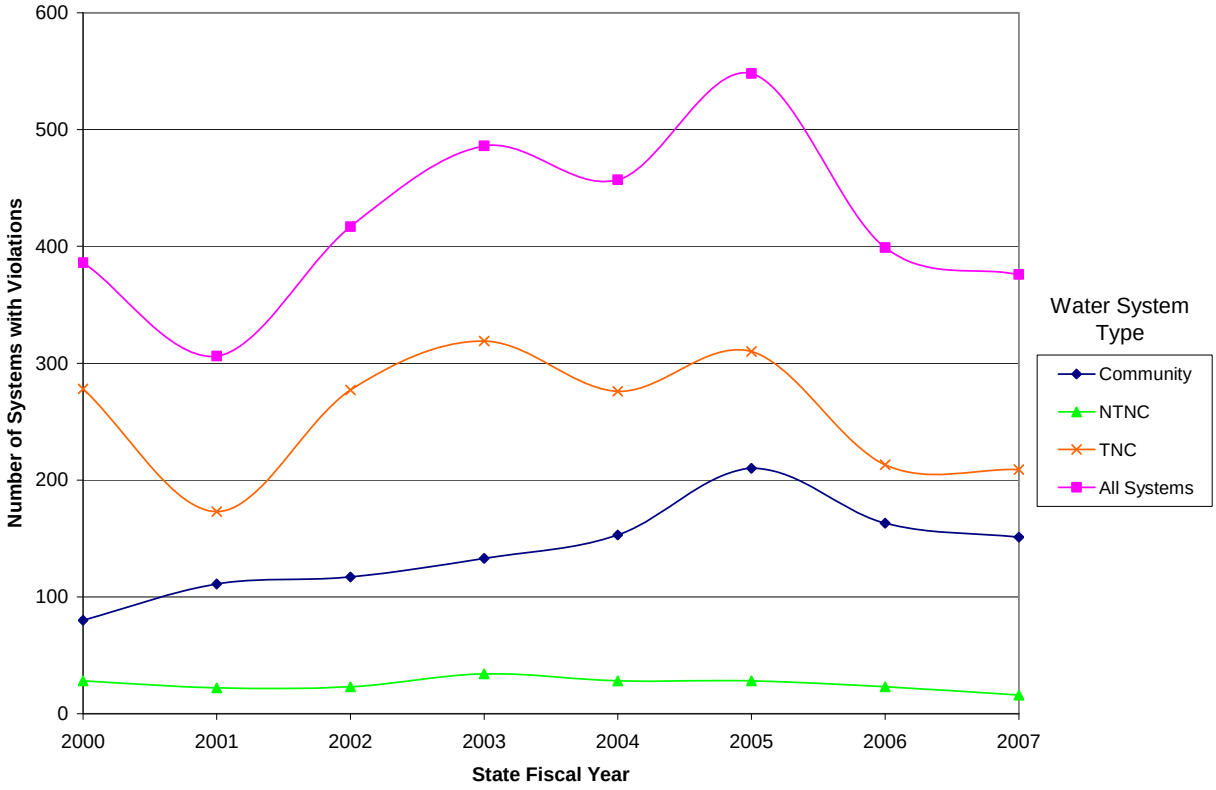


Figure A.4: Water Systems with MR Violations Since State FY 2000, Grouped by Water System Type

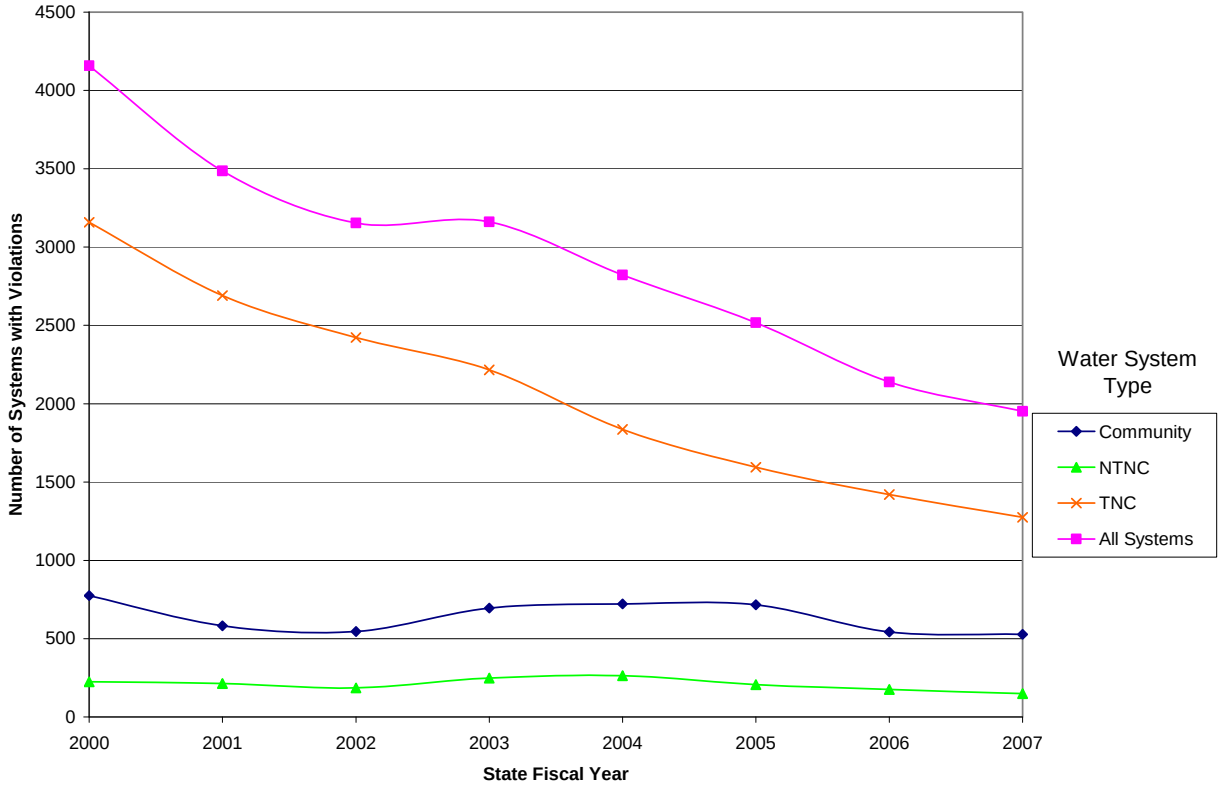


Figure A.5: Community Water Systems with MCL Violations Since State FY 2000

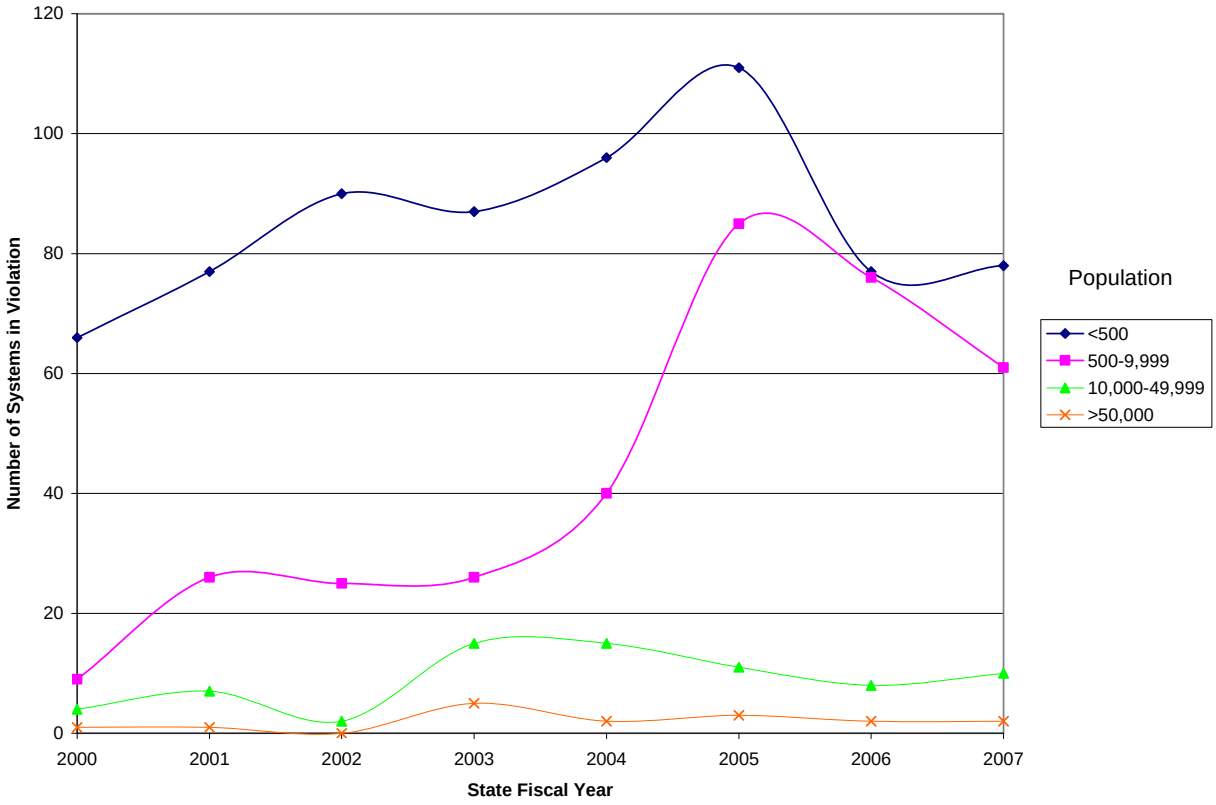


Figure A.6: Community Water Systems with MR Violations Since State FY 2000

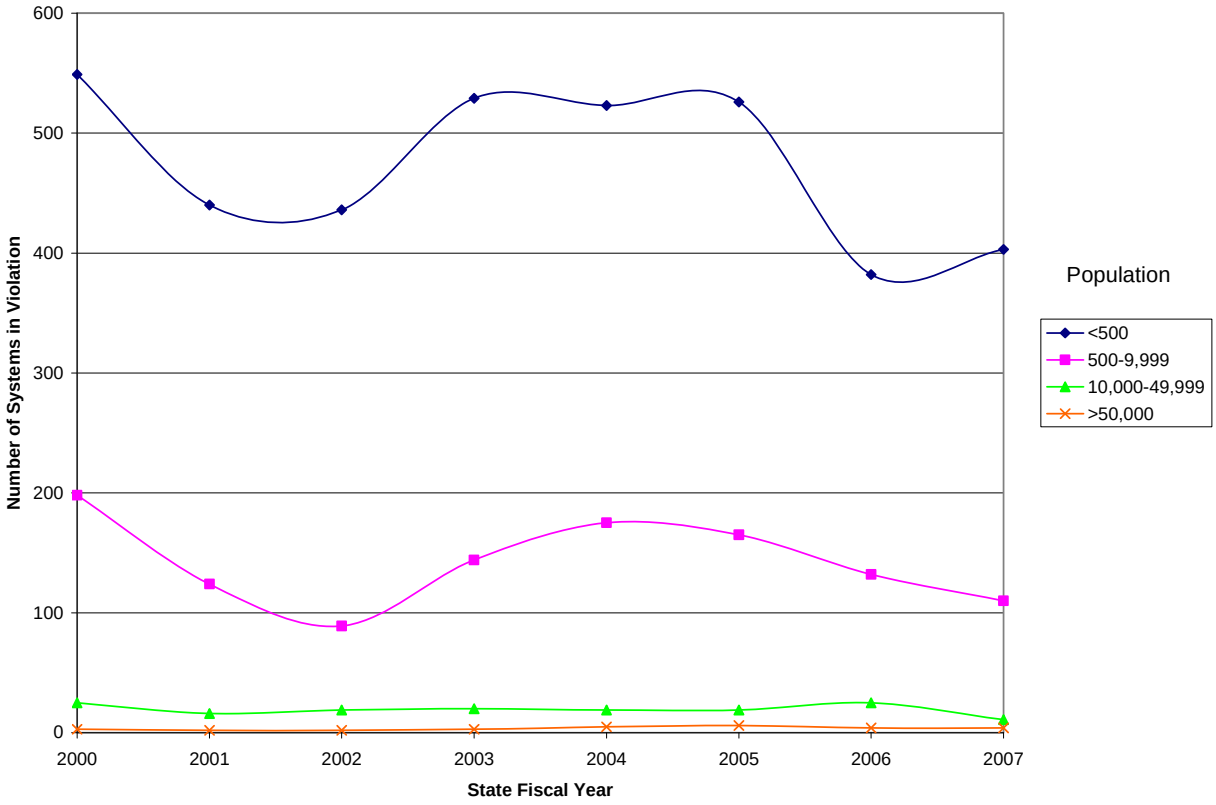


Figure A.7: Non-transient non-community Water Systems with MCL Violations Since State FY 2000

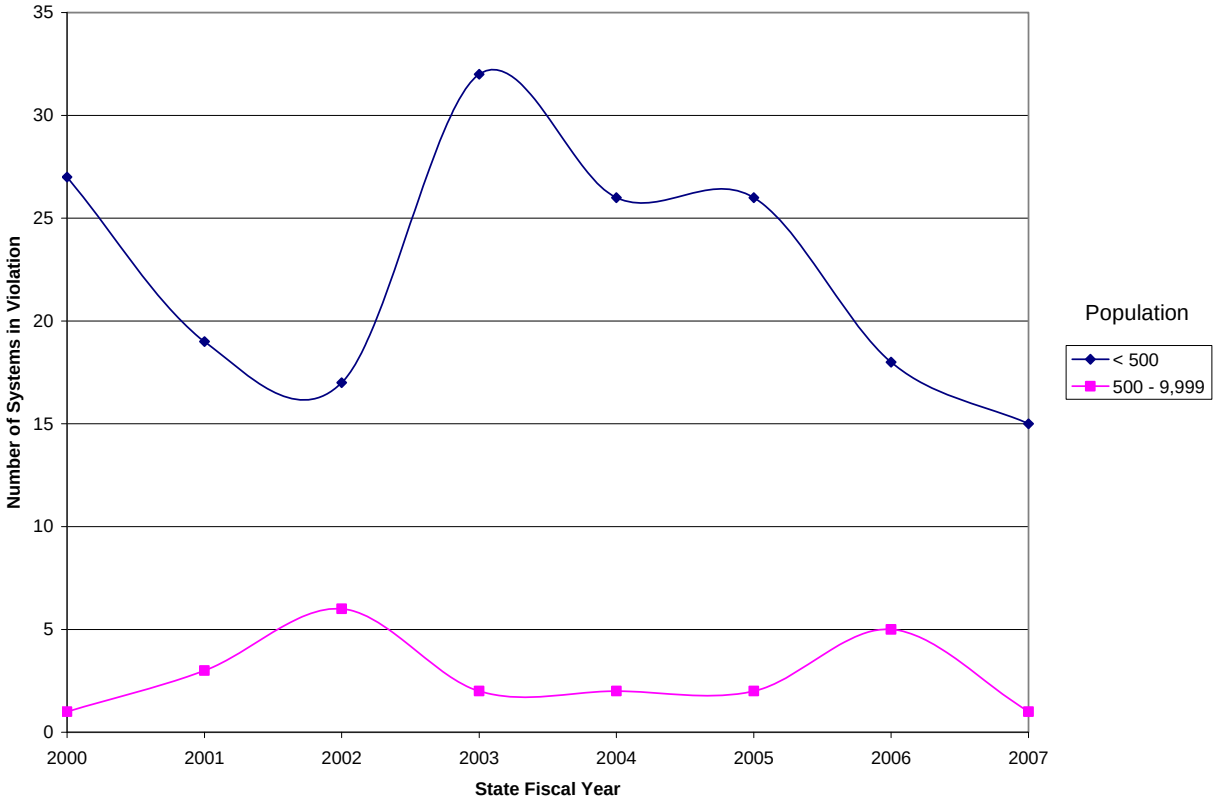


Figure A.8: Non-transient non-community Water Systems with MR Violations Since State FY 2000

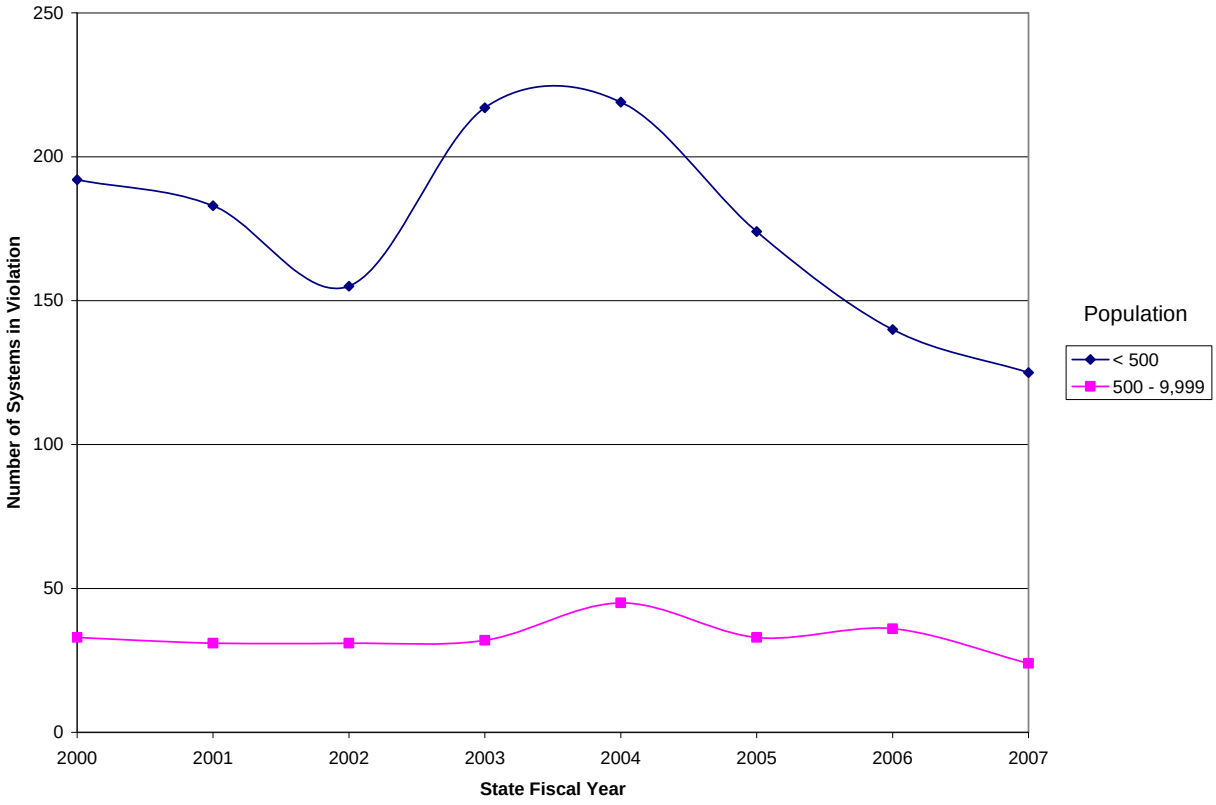


Figure A.9: Transient non-community Water Systems with MCL Violations Since State FY 2000

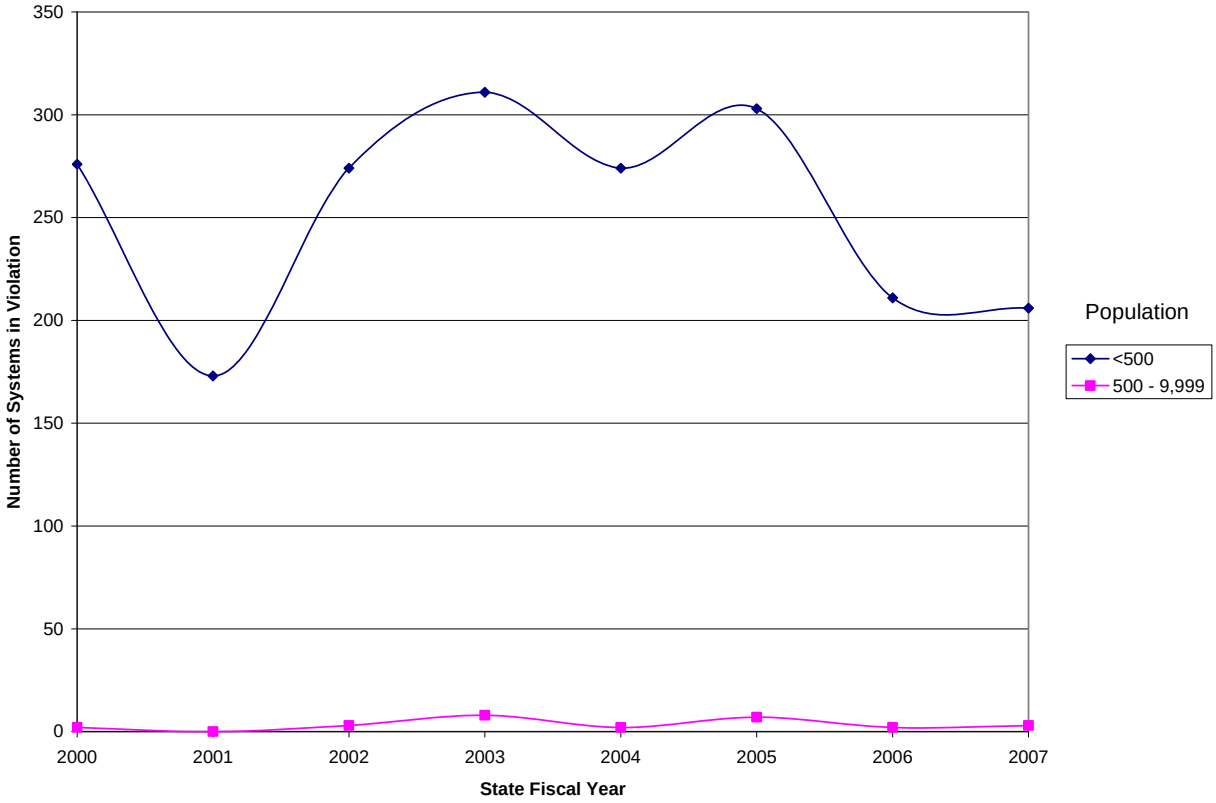


Figure A.10: Transient non-community Water Systems with MR Violations Since State FY 2000

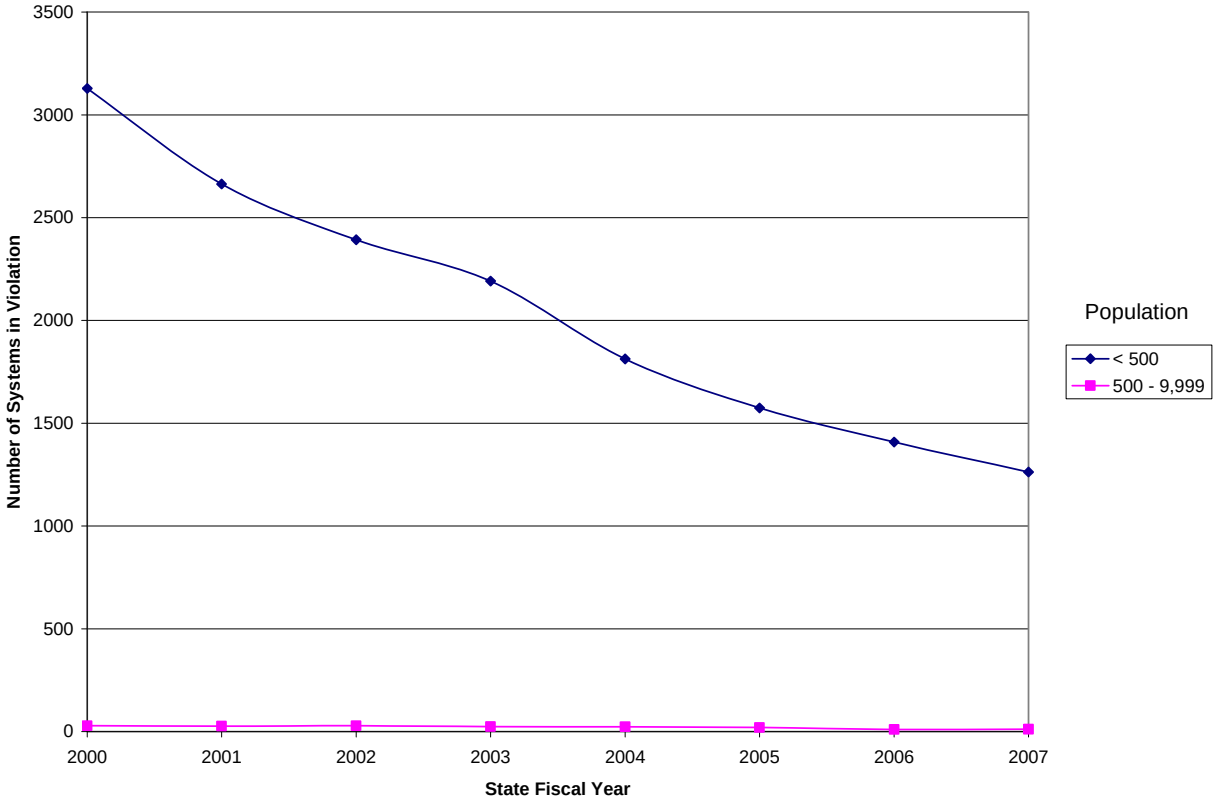


Figure A.11: Water Systems with MCL Violations Since State FY 2000, Grouped by Population

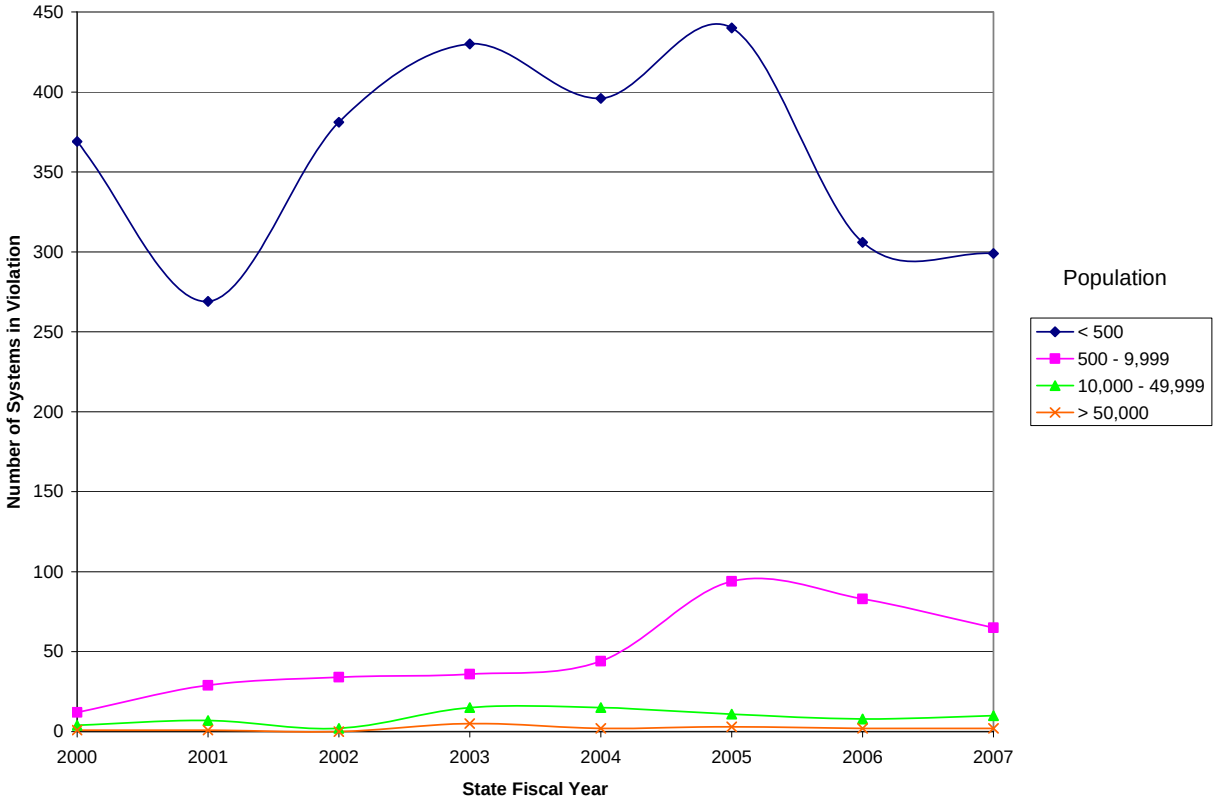
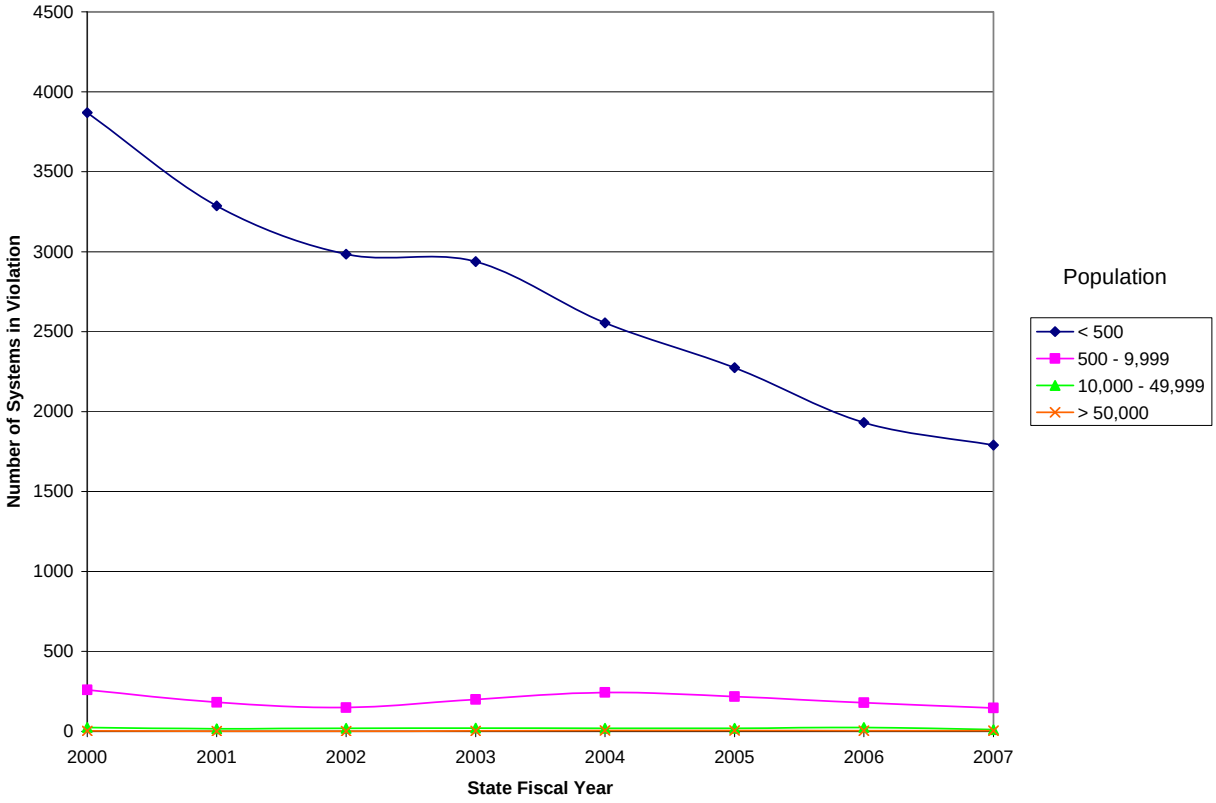


Figure A.12: Water Systems with MR Violations Since State FY 2000, Grouped by Population



Appendix B

Table B.1: Schedule of New Rule Implementation

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, NTNCWS
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, NTNCWS Subpart H, population >= 10,000
2002	DDBP	Disinfectant residual monthly sampling (with TCR schedule)	Chlorine and chloramines maximum residual disinfectant level established at 4.0 mg/L as RAA	CWS, NTNCWS Subpart H, population >= 10,000
2002	DDBP	TOC monthly monitoring	Treatment technique for TOC removal; ratio of actual to required removal >= 1.00 as RAA	CWS, NTNCWS Subpart H, population >= 10,000
2002	DDBP	Bromate monthly monitoring	Bromate < 0.010 as RAA	CWS, NTNCWS 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, NTNCWS 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, NTNCWS 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, NTNCWS Subpart H including populations < 10000
2004	DDBP	Bromate monthly monitoring	Bromate < 0.010 as RAA	CWS, NTNCWS Subpart H including populations < 10,000; Groundwater

Table B.1: Schedule of New Rule Implementation

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 <10000
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 <10000
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