

Report to Governor

CAPACITY DEVELOPMENT
for
MARYLAND PUBLIC DRINKING WATER
SYSTEMS



Department of the Environment
Water Supply Program

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Robert L. Ehrlich
Governor

Kendl P. Philbrick
Secretary

Michael S. Steele
Lt. Governor

Jonas A. Jacobson
Deputy Secretary

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Executive Summary

The Maryland Water Supply Program (WSP), within the Maryland Department of the Environment (MDE), is responsible for the implementation of the Safe Drinking Water Act (SDWA). This act requires that the State develop programs to ensure that both new and existing water systems have the technical, managerial and financial capacity to consistently provide safe drinking water. Regulations were developed requiring detailed information from new water system owners to demonstrate to the Department that their systems have adequate technical, managerial and financial capacity. The WSP is enforcing those regulations, which were effective October 1, 1999.

In the latter part of calendar year 2000, the WSP developed a capacity development strategy intended to further improve the technical, managerial and financial “capacity” or capability of Maryland’s existing public drinking water systems. The EPA Region III approved the strategy. The intent of WSP’s capacity development strategy has been to prioritize technical assistance and training to public drinking water systems with the ultimate goal of improving water system compliance and public health protection. In 2002 the WSP developed a baseline assessment of water system capacity using water system self-assessment surveys, compliance data, operator certification compliance and sanitary survey results. Improvements in system capacity are illustrated through case studies and updates to the strategy’s baseline.

Section 1420 (C) (3) of the Safe Drinking Water Act requires that by September 30, 2002 and every three years thereafter the head of the State agency must submit a report to the Governor on the efficacy of the strategy and the progress made toward improving capacity. The first Capacity Development Report to the Governor was submitted in September of 2002. This 2005 report is the second such report and presents changes in the process and improvements in capacity development since the 2002 report.

Since the 2002 report, Maryland has successfully achieved improvement in every major criteria that the WSP has developed to measure progress in capacity development. In particular, over 91% of Maryland’s community water systems now have certified operators, less than 3% of systems are on EPA’s Historical Significant Non-Compliant (SNC) list, and fewer than 10% of systems are in violation with lead and copper requirements. All of these criteria have shown marked improvement over compliance levels that were reported in 2002.

This 2005 report also shows how Maryland is working to coordinate its capacity development strategy with some of its other water supply functions, in order to achieve benefits in both capacity development and other water supply issues. For example, in 2004 three separate Advisory Committees in Maryland all recommended that State and local governments provide increased emphasis on water and sewerage planning, such as to achieve coordination of programs for water protection and the assessment of available water resources. This has, in turn, led to the WSP routinely reviewing all water and sewerage plans to insure (among other goals) a compliance with capacity development. Additionally, MDE formed the Water Supply Capacity Workgroup, to address issues surrounding water resource capacity for community water systems and prepared a draft guidance document for local governments which is currently under review.

The WSP has made excellent progress toward achieving technical, managerial, and financial capacity for all water systems in Maryland. However, the “easy” part of this progress may have already been achieved. In the future, the maintenance of the present strong capacity development program, the additional demands of new regulations and initiatives could compromise further progress.

What is Capacity Development?

Capacity development is the process of water systems acquiring and maintaining adequate technical, managerial and financial capabilities to enable them to consistently provide safe drinking water. To have sufficient “capacity”, a water system must have the technical abilities, managerial skills, and financial resources to meet current and future State and federal drinking water regulations. Technical capacity refers to the physical infrastructure of the water system, including but not limited to, the source water adequacy, infrastructure adequacy (including wells or water intakes, treatment, storage, and distribution), and the ability of system personnel to implement the requisite technical knowledge. Managerial capacity refers to the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective external linkages. Financial capacity refers to the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls. “Capacity development” is an effort by the Maryland Department of the Environment to help drinking water systems improve their finances, management, infrastructure and operations so they can provide safe drinking water consistently, reliably and in a cost-effective manner.

The 1996 SDWA Amendments require states to create mechanisms to prevent the creation of new nonviable community and nontransient noncommunity public waterworks and to develop a strategy to address the capacity of all existing public waterworks. The Maryland capacity development regulation for new drinking water systems became effective October 1999. The State’s capacity development strategy, which is a non-regulatory approach to improve the capacity of *existing* water systems, was approved by the Environmental Protection Agency (EPA) in September 2000. The intent of the capacity development strategy is to continue with effectively prioritizing technical assistance to public drinking water systems.

Why Was This Report Created?

Section 1420(c)(3) of the Safe Drinking Water Act (SDWA) requires that *not later than two years after the date on which a State first adopts a capacity development strategy, ... and every three years thereafter, the head of the State agency ... 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.*

This 2005 report to the Governor will describe the efficacy of the State’s capacity development strategy and the progress made towards improving the technical, managerial and financial capacity of public water systems since the 2002 report. The report will be made available to Maryland citizens through MDE’s website.

Maryland’s Water Supply Program

The Water Supply Program (WSP) is responsible for regulating public drinking water systems in Maryland and implementing the State’s capacity development programs. The WSP is a part of the Water Management Administration within the Maryland Department of the Environment. The mission of the WSP is to ensure that public drinking water systems provide safe and adequate water to all present and future users in Maryland, and that appropriate usage, planning and conservation policies are implemented for Maryland’s water resources. This mission is accomplished through proper planning for water withdrawal, protection of water sources that are used for public water supplies, oversight and enforcement of routine water quality monitoring at public water systems, regular onsite inspections of water systems,

and prompt response to water supply emergencies. In addition to ensuring that public drinking water systems meet federal and State requirements, the WSP also oversees the development of Source Water Assessments for public water supplies, and permits water appropriations for both public drinking water systems and commercial entities statewide. The WSP also coordinates statewide water system security efforts and undertakes planning activities in an effort to ensure the long-term sustainability of Maryland's water supplies. Because all of these programs reside together in the WSP, Maryland has the unique opportunity to evaluate, regulate and assist public drinking water systems from a broad perspective that advances the intent of the capacity development strategy. The Water Supply Program's activities help to ensure safe and adequate drinking water for more than 4.8 million Marylanders.

Public drinking water systems fall into three categories. Community water systems (CWS) serve year-round residents, non-transient non-community (NTNC) water systems serve regular consumers, such as in a school or daycare setting, and transient non-community (TNC) water systems serve different consumers each day, such as in a campground or restaurant. The WSP directly regulates community and NTNC water systems. Currently, transient non-community water systems are regulated and enforced by the local county environmental health departments through agreements with MDE, with the exception of systems in Prince George's, Montgomery, and Wicomico Counties, which are regulated and enforced by the Water Supply Program. Maryland has 502 community water systems, 576 non-transient non-community water systems, and 2,614 transient non-community water systems. Table 1 lists several drinking water statistics for Maryland.

| Table 1. Drinking Water Statistics | |
|---|-----------|
| Population of Maryland (2004) | 5,558,058 |
| Individuals served by Community water systems | 4,846,923 |
| Percent of population served by public water systems | 87% |
| Percent of population served by Individual wells | 13% |
| Number of Public Water Systems | 3692 |
| Number of Community Systems (CWS) | 502 |
| Number of Non-transient Non-community Systems (NTNCWS) | 576 |
| Number of Transient Non-community Systems (TNCWS) | 2,614 |
| Number of systems using surface water | 66 |
| Number of systems using only ground water | 3,626 |

Improving Capacity

Historically, the WSP has emphasized preventative measures, instead of reactive enforcement actions to both avert serious public health incidents and to assist in improving water system capacity. Preventative measures include activities such as sanitary survey inspections, training and technical assistance, Comprehensive Performance Evaluations, routine water quality monitoring, operator certification, financial assistance, consolidation, county water and sewer planning, source water assessments, and special initiatives. Table 2 summarizes a number of these preventative measures. Descriptions of several capacity-enhancing activities follow.

| Table 2. Water Supply Program's Major Activities for the Year 2004 | |
|---|--------|
| Sanitary Surveys Conducted of CWS and NTNCWS | 1100 |
| Sanitary Surveys Conducted of TNC Systems (by local gov't and MDE) | 418 |
| Comprehensive Performance Evaluations Conducted | 4 |
| Technical Reviews of Water Construction Projects | 50 |
| Water Appropriation Permits Issued (New and Renewal) | 1,239 |
| Individuals Certified to Sample Drinking Water | 981 |
| New Wells Sited | 60 |
| Water Quality Reports Reviewed | 38,315 |
| Source Water Assessments Mailed to Community Water Systems | 30 |

Sanitary Surveys

A sanitary survey is an on-site inspection of a public water system that includes an evaluation of water sources, treatment plants, distribution system, records keeping and other managerial elements. The assigned staff meets with either the town manager, system owner or certified operator to discuss system-related issues, inspects the water treatment plant, tests the water, and attempts to resolve any outstanding issues. Sanitary survey inspections are performed on a frequent basis for all public water systems. However, some systems including those utilizing surface water or ground water under the direct influence of surface water (GWUDI), and non-compliant systems receive the highest priority. The frequency of sanitary survey inspections for most systems ranges from more than once per year to once every three years. Inspectors follow up with systems when any deficiency that could affect either the quality or reliability of water produced by a system is identified.

Training and Technical Assistance

The WSP provides funding to support a Maryland Rural Water Association (MRWA) circuit rider, who trains operators of small systems. In addition, the WSP often provides presenters for training events around the State. For example, WSP sponsors an annual Ground Water Symposium and provides speakers for the Maryland Center of Environmental Training's (MCET) "SDWA and Compliance" class. At the 2004 Groundwater Symposium, information was presented about wellhead protection, the health impacts of arsenic and lead in drinking water, and water supply and capacity issues for community water systems. WSP refers systems in need of assistance to the MRWA, whose circuit rider is able to provide hands-on training to system operators and managers for chemical feed systems, leak detection, corrosion control, consumer confidence reporting, rate setting, and applying for funding assistance. The WSP also provides technical information directly to system operators and owners, especially during sanitary surveys or as follow up to customer complaints or system emergencies. WSP staff meet quarterly with representatives from the Maryland Center for Environmental Training, Maryland Rural Water Association, Maryland Rural Development Corporation, and the University of Maryland's Environmental Finance Center with the goal of enhancing training opportunities geared toward improving water system capacity. In May 2005, information about available training organizations was mailed to all certified water system operators in Maryland.

Surface Water Filtration Plant Optimization Program

MDE has a long history of working to improve the technical, managerial and financial capacity of Maryland's filtration plants, which serve the vast majority of Maryland's population. This has primarily been accomplished through the use of Comprehensive Performance Evaluations (CPE). CPEs are used to evaluate the performance of a surface water treatment plant to determine if the plant is optimized for removal of particles and parasitic organisms such as *Giardia* and *Cryptosporidium*. The CPE assists in identifying areas of potential improvement in the operation, maintenance, design, and administration of the plant in order to achieve optimized plant performance. Since 1990, when WSP adopted optimization goals and began conducting CPEs, the process has helped improve surface water systems' technical, managerial, and financial capacity and has strengthened drinking water treatment understanding among operators, and local government officials across the State. Because of these benefits, the WSP plans to continue to perform CPE's, with periodic re-evaluations, at Maryland's surface water plants. In addition, in 2003, MDE began participation in EPA's Area Wide Optimization Program (AWOP). Additional optimization efforts that compliment MDE's ongoing CPE program include better tracking of turbidity data and prioritizing filtration plants that can benefit from technical assistance. Since 2001, 21 CPE's have been performed at Maryland surface water treatment plants.

Monitoring

All public water systems must monitor their water on a frequent basis for various contaminants. The WSP employs four separate technical assistance mechanisms related to monitoring that help systems remain in compliance.

Yearly monitoring schedules In 1995, the State of Maryland began sending yearly monitoring schedules, which list all required contaminant sampling, to each community and NTNC system. This process increased the efficiency and effectiveness of tracking a system's monitoring, and improved monitoring compliance. Monitoring schedules are mailed to water systems annually, and include information about new and future regulations. The schedules are used as a reference by many systems throughout the year.

MDE-provided sampling MDE assists in the sampling for a number of contaminants at small community and NTNC systems. In addition, MDE occasionally samples systems in response to complaints or under special conditions.

Waiver plan The WSP has an EPA-approved waiver plan and may issue certain contaminant-specific waivers to systems. These waivers are based on susceptibility of the source water, location of the source and potential for the occurrence of the contaminant.

Monthly operating report (MOR) reviews The WSP requires community and NTNC public water systems that provide treatment, to complete and submit operating reports on a monthly basis. Because MORs provide day-to-day information on how a plant is performing, they can assist WSP in identifying any systems that may have compliance or capacity needs.

Operator Certification

Maryland's operator certification program has been in effect for over 30 years. The EPA established new operator certification guidelines in 2000, and in July 2001 the EPA approved Maryland's operator certification program. Maryland's certification program verifies that water system employees are trained to operate water systems based on the complexity of the water treatment plant (WTP). All community and NTNC public water systems are required to have properly certified personnel to operate their WTPs. MDE administers this program through the Board of Waterworks and Waste Systems Operators. The Board establishes training, experience, testing, and education requirements for WTP operators depending on a system's classification. Operator certification is discussed further in a later section of this report.

Financial Assistance

MDE's Financial Assistance Program and the Drinking Water State Revolving Fund (DWSRF) provide systems financial assistance through either grants or loans. The purpose of the Financial Assistance Program is to assist small communities with infrastructure needs and insufficient or limited financial capabilities to correct water supply related health problems and to meet SDWA requirements. Typical projects under this program include well development, and upgrades of water treatment facilities, water storage tanks, and water distribution facilities. Applicants may be required to develop a plan of action to provide financial stability to the system in the future. Because the Financial Assistance Program provides grants tailored more towards correcting potential or real health and water quality problems, this is an excellent mechanism MDE utilizes to prevent or correct noncompliance at small community systems and improve water system technical capacity.

In addition to providing grants, MDE supplies financial assistance through the DWSRF. The purpose of the DWSRF is to make low-interest-rate loans to both community water systems and non-profit non-community systems for drinking water infrastructure projects. Systems applying for DWSRF loans must develop a plan for future financial stability and must meet capacity requirements. These measures help to ensure that systems with technical, managerial and financial capacity receive funds. MDE's 2005 Intended Use Plan includes SRF funding for 10, mostly small, water systems needing assistance for compliance or water quality related problems. This list includes the Lexington Park Arsenic Removal System in St. Mary's County and the Port Deposit Water Treatment Plant upgrade in Cecil County.

Consolidation

It is WSP's policy to always consider consolidation of small water systems when feasible. Whether two or more small systems merge into one larger system, or a large system extends its service area to a smaller one, consolidation affords systems the advantage of having a greater pool of resources to provide a safer and more reliable water supply. The WSP encourages consolidation as a way to correct capacity and non-compliance problems. As regulatory requirements continue to increase and become more complex, it will become increasingly more difficult for smaller, independent systems to remain compliant. With the greater amount of resources afforded to consolidated systems, they should find compliance with SDWA regulations less of a burden. In FFY 2004, WSP assisted the Darlington School to connect to the Town of

Darlington's water system to eliminate well contamination and improve system cost efficiency (see Appendix A, Case Study "Harford County – Darlington School").

County Water and Sewer Planning

In 1997, the Maryland Legislature enacted Smart Growth legislation limiting most State infrastructure funding to areas that local governments designate for growth (Priority Funding Areas). Through the Smart Growth planning process, funding programs such as the DWSRF give preference to infrastructure improvement projects that are in the Priority Funding Areas. All new water systems must be incorporated in the County Comprehensive Water and Sewer Plans before a MDE Construction Permit is issued. This requirement helps to prevent unnecessary new systems. These planning processes generally encourage consolidation of small systems to improve system reliability and economy. In addition, the County Water and Sewer Plans assist in the long-term planning of water resources and treatment plants thereby reducing the potential for undersized water treatment plants and water outages.

In 2004, three separate Advisory Committees recognized that the orderly development of Maryland communities is dependent on effective water and sewerage planning. The Advisory Committee on the Management and Protection of the State's Water Resources, the Water Security and Sewerage Systems Advisory Council, and the Interagency Technical Advisory Committee all recommended that the State and local governments provide increased emphasis on water and sewerage planning in Maryland, such as enhanced coordination of programs for source water protection and assessments of available water resources. In January 2005, the WSP began routine comprehensive reviews of all water and sewerage plans to ensure compliance with capacity development and other SDWA requirements.

Source Water Protection

The WSP performs well siting, produces source water assessments for ground water and surface water supplies, and oversees special wellhead protection projects. The WSP also coordinates or conducts several special projects to identify sources of contamination. For instance, dye trace studies have identified the sources of contamination for a number of systems.

Special Initiatives

The WSP frequently implements special initiatives that affect drinking water systems. Security / emergency preparedness is a good example of one of WSP's special initiatives that are related to capacity development. Another example is the recent formation of a work group to address capacity issues.

Security and Emergency Preparedness Since the tragic events of September 11, 2001, MDE Water Supply Program staff have been in close communication with Maryland's water supply systems by advising them of steps to take to protect their water facilities. MDE has developed and continues to update an email database for over 300 water systems and continues to advise the water systems of the latest security related information. In addition, during 2003-4, WSP utilized this database to help some systems alleviate damage and other problems caused by Hurricane Isabel. Often both technical and managerial capacity is improved when systems enhance their emergency preparedness. In 2003, MDE hired a coordinator to oversee security issues that include providing technical assistance to MDE staff and water systems. This employee has been assigned to the newly created Water Policy and Security Division within the WSP.

As part of the ongoing efforts to enhance water security in Maryland, the WSP selected a contractor to provide the following security services: create standard emergency operating procedures; conduct a high-level security conference as well as undertake training sessions for essential WSP staff and water industry employees; and conduct simulated disaster exercises with follow up analyses. The work required in this contract will take place in three phases. Phase I involves the development of a water security strategic

plan. Phase II will involve water security training. Phase III will involve the undertaking of a water security emergency exercise to examine and evaluate the training and security plan. The timeframe for completion of this contract is scheduled for late 2006.

Water Supply Capacity Work Group In 2004, MDE formed a work group to address issues surrounding the adequate capacity of community water systems. The work group consisted of several planners, public works directors, and environmental health officers from county and local governments, in addition to staff from MDE and the Maryland Department of Planning. The work group met five times, and focused on how to assess accurately the water production capacity of both new and existing community systems, and how to ensure, through local and county review processes, that adequate capacity will exist to serve proposed development. MDE prepared a guidance document for local governments, which is currently under review.

Efficacy of the Strategy

In 2002, the WSP established baseline values for evaluating capacity through water system self-assessment surveys, evaluation of water system compliance with federal and State regulations, assessment of operator certification compliance, and the observations of sanitary survey inspectors. This baseline was presented in the 2002 Capacity Development Report to the Governor. Data from the baseline has been used to focus assistance activities and to coordinate and publicize training and assistance opportunities for water systems. One method of observing, monitoring and improving the efficacy of the strategy is to compare the baseline values of the strategy with the values achieved in subsequent years and the current goals for improvements.

Improvements to the Baseline

Self-assessment surveys have been received from all water systems except for a few new or newly discovered systems that were added to the public water supply inventory in 2004 or later. Other baseline factors in which improvements have been documented include the percentage of systems with a certified operator, the percentage of systems that have an emergency plan and the percentage of systems that had a sanitary survey every three years. Appendix B provides a revised “Baseline and Future Improvements” table. This table includes the baseline value and subsequent data, if available. Following is a discussion of each of the major components of the baseline.

Data from this ongoing evaluation will be used to coordinate training and assistance opportunities for water systems in order to help meet the established capacity development goals. The capacity development training workgroup, which includes the primary training and technical assistance providers in Maryland, evaluated the results of the survey and decided that training on new drinking water regulations, water system management, rate setting and vulnerability assessment training would be prioritized. The WSP plans to continue to coordinate training activities and to meet, as appropriate, with the strategy workgroup. The Capacity Development Training Workgroup meets approximately four times each year to coordinate training opportunities and focus training efforts on enhancing water system capacity. Each year a summary of training opportunities is mailed to water systems with their annual monitoring schedules or directly to water system operators. The WSP’s future activities will include working closely with workgroup members to facilitate additional financial and managerial training sessions.

Compliance

The baseline contained two compliance parameters; the number of systems with a history of significant noncompliance, and the number of systems with lead and copper violations during the most recent

calendar year (CY). A system is considered to be in significant noncompliance (SNC) if it has violated one or more National Primary Drinking Water Regulations in any three quarters within the last three years. The 2003 Historical (FY2000-FY2002) SNC list had 26 systems, which is less than 3% of community and nontransient noncommunity (NTNC) systems, much improved over the 2000 Historical SNC list which had 51 (5%) systems. EPA will compile the next list of historical SNCs in 2006 which will include all community water systems that were SNC for three or more quarters during the period of FY2003 through FY2006.

The second compliance parameter is the number and percentage of systems with lead and copper violations. The number of CY 2004 violations is 110, which is an approximate 45% improvement over the CY 2001 reported value of 201. This also represents an approximate 40% improvement over the CY 2002 reported value of 183. In the future, the Water Supply Program will continue to focus on reducing the number of violations.

Operator Certification Compliance

Over the last three years, WSP staff have actively notified and reminded systems of their need to employ certified operators. As a result, a number of systems have acquired certified operators or encouraged their existing operators to become certified. Water system compliance with the Operator Certification Program is tracked through the Water Supply Program’s ORACLE database that manages all data under the PWSS grant. In 2004, the Water Supply Program coordinated updates to the Public Drinking Water Information System (PDWIS) database from the Board’s administrative database. Information on operator coverage is provided through a number of areas including sanitary surveys, monthly operating reports, surveys and system communications. At least 91% of community water systems were in compliance with the requirement to maintain a certified operator. The percentage of certified operators at nontransient noncommunity water systems improved from 40% at the end of calendar year 2001 to 76% in June 2005.

Table 3 summarizes the information that is currently available in the database as of June 2005. Two hundred seventy (270) more Maryland water systems have employed certified operators than in 2001.

TABLE 3: MARYLAND OPERATOR CERTIFICATION COMPLIANCE

| Water System Type | Number of Systems | | Number of Systems with Operators | | Percentage of Systems with Operators | |
|-----------------------------|-------------------|---------------|----------------------------------|---------------|--------------------------------------|---------------|
| | 2004 | 2001 Baseline | 2004 | 2001 Baseline | 2004 | 2001 Baseline |
| Community | 502 | 503 | 458 | 402 | 91% | 80% |
| Non-transient Non-community | 576 | 568 | 439 | 225 | 76% | 40% |
| Total | 1078 | 1071 | 897 | 627 | 83% | 59% |

Sanitary Surveys

The WSP had an improvement in the sanitary survey frequency tracking parameter with 98% of community and nontransient noncommunity systems receiving a sanitary survey within three years. Water system deficiencies are identified during sanitary survey inspections. Deficiencies are characterized as major, moderate, and minor based on the significance to health or comfort of the system’s customers and the frequency at which the problems are likely to occur. These deficiencies do not include violations, since violations are tracked separately in the database. Though not violations of specific regulations, deficiencies have potential public health impact and are generally an indication of problems with technical capacity. Follow-up is requested for any deficiency that could affect either the quality or reliability of water produced by a system. Since the WSP began tracking deficiencies in our database, over 270 system deficiencies have been recorded in our database.

Table 4 indicates that a majority of deficiencies were moderate deficiencies. Examples of possible moderate deficiencies include substandard well cap, low pressure, and high iron levels with a history of customer complaints. These conditions are less likely to pose an imminent and significant threat to health of consumers than do major deficiencies. Examples of possible major deficiencies include extremely low pressure in the distribution system on a routine basis, a storage tank with a leak, an active open well, severe staffing deficiencies at a surface water treatment plant or other system that needs treatment to meet a contaminant standard, and a well that is likely to be flooded. Minor deficiencies may cause a minor aesthetic nuisance to consumers, inefficient operations, or less-than-optimal plant performance without being a threat to health or comfort of consumers. Examples of possible minor deficiencies include moderate iron or manganese levels with sporadic complaints, and minor safety and maintenance problems. Sixty percent of deficiencies have been resolved, up from 42% resolved in 2002. Table 4 summarizes the water system deficiencies noted during sanitary surveys as of December 31, 2004.

TABLE 4: WATER SYSTEM DEFICIENCIES NOTED DURING SANITARY SURVEYS

| Type of Deficiency | 2004 Number of Deficiencies | 2004 Number of Deficiencies Resolved | 2004 Percentage of Deficiencies Resolved | 2001 Percentage of Deficiencies Resolved |
|--------------------|-----------------------------|--------------------------------------|--|--|
| Major | 19 | 15 | 79% | 67% |
| Moderate | 170 | 109 | 64% | 32% |
| Minor | 82 | 39 | 48% | 56% |
| Total | 271 | 163 | 60% | 42% |

In addition to improving technical capacity of the water system, the sanitary survey is often used as a tool for initiating improvements in managerial and financial capacity. WSP staff provide guidance and request standard operating procedures, emergency plans, staffing-adequacy information, etc. from water systems to improve the overall operation and management of the treatment system.

During sanitary surveys, staff review the water systems’ emergency response plans. An emergency response plan is a document that organizes a community water system’s response to various possible emergencies such as a power outage or water contamination. They generally include telephone and contact numbers for a number of key personnel including water system managers, chemical suppliers, equipment manufacturers, well drillers, alternative water suppliers, and MDE. Plans for specific emergencies such as security attacks, power outages and microbiological contamination can also be

included. Currently, at least 75% of community water systems have emergency plans, a significant increase over the 43% of systems that had emergency plans in 2002.

Efficacy Summary

The successes and challenges of the strategy and baseline as well as goals for the future are addressed below. In general, implementation of the strategy has been manpower intensive, but has been an informative and important effort.

Self-assessment surveys In the future, we will utilize the self-assessment data to determine whether improvements occurred in the areas of water conservation, rate structure, and knowledge of future and current rules including whether additional treatment will be required. A second self-assessment survey will be conducted in 2007.

Compliance Maryland has an excellent record with respect to the low number of water systems in violation of SDWA regulations. We will continue to focus attention on particularly recalcitrant systems, significant noncompliers, and systems with a great potential of having significant compliance or public health issues in the future. However, since several new regulations became effective in the past three years, we expect that new violations will emerge. Approximately 45 systems have naturally occurring arsenic levels that exceed the recently established standard of 10 micrograms per liter (ug /L). WSP has been working with the water suppliers since September 2004 to assist them in identifying and implementing appropriate actions to achieve compliance with the new standard, however it is expected that some systems may not be able to fully implement needed improvements before the January 2006 compliance deadline, and will therefore be in violation following that date. This is common when a new regulation is adopted. Hence, our focus remains on reducing the number of historical significant noncompliers, while continuing to assist existing systems in meeting new standards.

Operator Certification Certification of operators has been successful. In particular, the vast majority of community systems are known to have certified operators. Challenges for improvements include a lack of available and/or affordable certified operators. We will continue to work with the Board of Water And Waste Systems Operators and to help systems identify training opportunities in order to improve the percentage of systems reported to have certified operators.

Sanitary Survey The tracking of sanitary survey deficiencies and emergency plans in a database has been helpful to WSP staff. A WSP goal is to increase the percentage of deficiencies that are resolved and to continue to offer assistance to prevent deficiencies. Efforts are currently being made to ensure that all community and NTNC systems receive a sanitary survey within three years, as has been WSP's goal. As of December 31, 2004, 98% of these systems have had a sanitary survey within three years. Frequent sanitary surveys help to maintain compliance and protection of public health in addition to resolving water system deficiencies and promoting operator certification.

Conclusion

The WSP's goal is to continue to improve the ability of Maryland's water supply systems to provide safe and adequate drinking water. The WSP has been an active participant in improving Maryland's drinking water systems in the past, even before a formal capacity development strategy was required. With the ongoing implementation of the capacity development strategy, WSP has achieved enhanced tracking and corrections of sanitary survey deficiencies, established the water system self-assessment survey and corresponding database, enhanced communication with training assistance providers, continued to provide assistance to systems who have significant potential compliance or health-related issues, developed a written strategy to effectively improve and measure capacity improvements, and identified future

implementation challenges. The effectiveness of Maryland's capacity development efforts is dependent on maintaining a strong "presence" with water suppliers, including prompt responses to water system violations, abundant training opportunities, and frequent on-site inspections. Implementation of new regulations and new initiatives, such as water system security efforts, place increasing demands on existing staff. These additional demands, as well as the challenges of replacing vacant positions, could impact the WSP's ambitious goals for conducting frequent sanitary surveys and could compromise the Program's excellent progress toward achieving technical, managerial, and financial capacity for all water systems.

Appendix A

CAPACITY DEVELOPMENT CASE STUDIES

WSP has a long history of working with systems to address their violations and to ensure safe and adequate water to the citizens of Maryland. The following case studies highlight recent successful capacity improvement efforts.

Cecil County - Perryville – In 2003, during flooding from the remnants of Tropical Storm Ivan, Perryville water treatment plant was off-line for 4 days due to a clogged intake in the Susquehanna River. WSP staff was on site for 3 of those 4 days and helped expedite an emergency connection to a neighboring community water supply and offered technical support on how to unclog the intake and be better prepared for future intake problems.

Anne Arundel County Public Schools – In early 2002, WSP staff discovered that 13 public water systems owned and operated by Anne Arundel County Public Schools were not performing routine water quality monitoring and reporting. These systems provide water to approximately 5,400 students, teachers, and administrators. Treatment at most of the systems consists of chlorination and corrosion control; a few of the systems also remove iron. After persistent follow-up by Water Supply Program staff, which included multiple site visits and the creation of site-specific monitoring forms with detailed instructions, Anne Arundel County Public Schools obtained the necessary testing equipment and implemented a daily monitoring program. Earlier this year, the Water Supply Program and Anne Arundel County Public Schools conducted a joint training course that helped the daily samplers further understand use of the monitoring equipment and reporting requirements. Since the monitoring program at these systems began, water quality has improved and has become more consistent. The Water Supply Program will continue to work with these systems to ensure that proper monitoring and reporting are occurring.

Anne Arundel County – Associated Property Management – In 2002, the Water Supply Program discovered that four public water systems managed by Associated Property Management were not conducting daily visits to the treatment facilities or performing routine water quality monitoring even though several chemicals are added to the water. These facilities, located in central Anne Arundel County, supply water to several businesses. In addition, groundwater contamination was discovered in wells at one of the facilities. After assessing the problem, WSP staff convinced the Associated Property Management to hire qualified personnel. The operators are now routinely visiting the facilities and monitoring the water quality to help ensure a safer and more reliable system. The operators are also optimizing the existing treatment as well as providing water treatment operations training to Associated Property Management Staff. To address the groundwater contamination in two of the wells, the system is testing an activated carbon treatment system and is in the process of replacing a well.

Allegany County – Klondike – Klondike, with a population of almost 400 people in Allegany County, Maryland, was a community-operated water system in violation of the Surface Water Treatment Rule. Even though the source water was from a relatively safe stream-fed reservoir, only minimal treatment was in place. Additionally, low pressure in portions of the distribution system were common due to undersized, broken and freezing mains. The community was unwilling and unable to finance construction of a new plant and distribution system. Beginning in 1998 however, the WSP organized and attended several public meetings in the community to discuss options to improve their water system. As a result, they decided to request the County to take over their water system so they could connect to the Frostburg regional water system. On Klondike's behalf, MDE had already negotiated their share of capacity with Frostburg in 1995. In 2005, after construction of a new distribution system, the old Klondike water

treatment plant was demolished and the community was connected to the Frostburg water supply. Clean water with adequate pressure is now being enjoyed by the entire community.

Harford County - Darlington School

The School's water system was served by two wells that had coliform bacteria. One was located in a pit, both were constructed prior to modern well construction standards, and both were located in close proximity of potential contamination sources. Water Supply Program field and source water assessment staff were aware of a proposed rehabilitation and extension of water supply service in the nearby Town of Darlington water system. WSP encouraged and helped to facilitate the connection of the Darlington School to the Town of Darlington water system, thus making the Darlington water system inactive and encouraging consolidation into one water system. In July 2004, Darlington School ceased to exist as a public water system thus eliminating potential future expense related to the contaminated sources and reducing costs for maintaining it as a separate water system.

Cecil County - Forest View Village and Sherwood Forest

A review of the source water assessment for Forest View Village Mobile Home Park (MHP) revealed a defunct fireworks manufacturer inside the wellhead protection area for both of the park's wells. In October of 2002, MDE requested that the owner sample the wells for perchlorate. The owner was also in the process of developing Sherwood Forest MHP on an adjoining property. WSP also requested perchlorate testing of the two wells for the planned park for perchlorate. Three of the four wells tested positive for perchlorate, as high as 32 ppb. WSP required construction of treatment and encouraged the owner to consolidate both water systems. In March 2004, the new plant consisting of ion exchange using a resin selective for perchlorate went on line, which serves both Forest View Village and Sherwood Forest MHP.

Appendix B

BASELINE AND FUTURE IMPROVEMENTS

| Baseline Category | Baseline | Baseline Value | CY 2004 | Comments |
|-------------------------------------|--|---|---------|--|
| Self-Assessment Survey ¹ | <i>Managerial:</i> | | | |
| | Percentage of unaccounted or lost water (for Community Water Systems (CWS)) | Maximum – 35% Average – 11% | N/A | State budget considerations restrict efforts in this area. WSP will continue to support water conservation where possible. |
| | Percentage of CWS aware of the need for additional treatment as a result of future regulations | 12% (47 systems) | N/A | The WSP continues to offer training regarding new regulations at a variety of venues throughout the year. In CY 2004, all water systems affected by the changed arsenic standard were asked to submit compliance plans to MDE. |
| | <i>Financial:</i> | | | |
| | The last time water rates were changed (CWS) | Average Year: 1997 | N/A | WSP continues to encourage water systems to periodically review rate structures. |
| | <i>Technical:</i> | | | |
| | Percentage of CWS operators/managers that request regulation training | Future rules – 49% (201 systems) Current rules – 36% (145 systems) | N/A | WSP provided annual monitoring schedules and information packets to systems. In 2005, a separate mailing was also sent to all water system operators. |

¹The self-assessment survey contains 51 questions. This table includes a selection of answers to questions from that survey. Because of the resource-intensity of the survey, WSP plans to conduct an additional survey in CY 2007 and every six years thereafter. The 2008 report to the Governor should include updated survey responses.

| Baseline Category | Baseline | Baseline Value | CY 2004 | Comments |
|-------------------------------------|---|---|---|--|
| Compliance Data ² | Number of SNC systems (CWS & NTNC) | 51 systems (5%) | 26 systems (< 3%) | WSP continues to work with the current SNCs to reduce or maintain the number of systems on the 2006 Historical SNC list to less than 2% |
| | Lead and copper violations (CWS & NTNC) | 201 violations at 141 systems (approximately 13% of active systems) | 110 violations at 105 systems (less than 10% of active systems) | Maintain or reduce violations to a low level. |
| Operator Certification ³ | Percentage of CWS and NTNC systems with certified operators | CWS – 80% (402 systems) | CWS – 91% (458 systems) | Continue efforts to increase percentage to near 100%. |
| | | NTNC – 40% (225 systems) | NTNC – 76% (442 systems) | |
| Sanitary Surveys ⁴ | Percentage of non-regulatory (major, moderate, and minor) deficiencies resolved | Major – 67% resolved | Major – 79% resolved | Assist the systems to comply with MDE recommendations with a goal of 60% resolved. Possibly improve or reevaluate the tracking of deficiencies and deficiency resolution. |
| | | Moderate – 32% resolved | Moderate – 64% resolved | |
| | | Minor – 56% resolved | Minor 48% resolved | |
| | Percentage of CWS and NTNC systems where MDE has conducted a sanitary survey within the last 3 years ⁵ | 89% (953 systems) | 98% (1062 systems) | WSP will strive to maintain level at or above 95%. |
| | Percentage of CWS systems with emergency plan of operation. | 43% (216 systems) | 75% (376 systems) | WSP will continue to assist medium and large systems to comply with federal emergency response plan requirements, and provide technical assistance on emergency planning to all systems. |

²SNC data obtained from EPA's list of Historical Significant Noncompliers for the period of 2000 – 2002. Lead and Copper violations reported from MDE's Public Drinking Water Information System (PDWIS) database.

³Data from MDE's PDWIS database.

⁴Data from MDE's PDWIS database.

⁵Current federal requirement is a minimum of one sanitary survey per system every 5 years.