
**DRINKING WATER
CAPACITY DEVELOPMENT PROGRAM
REPORT TO THE GOVERNOR**

Submitted to Governor John Hickenlooper

By the Water Quality Control Division
Colorado Department of Public Health and Environment

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Executive Summary

Over 2,000 active public drinking water systems exist in Colorado. These systems range in size from a small restaurant or community of 25 people to a service area the size of metropolitan Denver. Some use groundwater wells as a source of supply, and some use the state's rivers, lakes, and reservoirs. Treatment at public water systems spans a broad range – from a simple well and chlorinator to complex treatment systems with a construction and operations price tag in the millions of dollars each year. For all public water systems, the complexity of the federal Safe Drinking Water Act (SDWA) can make compliance with regulatory requirements difficult to achieve.

The 1996 Amendments to the Safe Drinking Water Act (SDWA) added provisions for each state to develop a Capacity Development Program to assist public water systems in developing technical, managerial, and financial capabilities so they can strengthen their ability to supply safe drinking water to the public. States that fail to implement a Capacity Development Program, and fail to submit a report on the effectiveness of the program to the Governor by September 30 of every third year, risk losing 20 percent of the annual federal Drinking Water State Revolving Fund (DWSRF) capitalization grant the state is otherwise eligible to receive. This report is intended to meet Federal requirements.

The Safe Drinking Water Program of the Water Quality Control Division at the Colorado Department of Public Health and Environment fully implements a Capacity Development Program that aligns with the requirements of the SDWA. As required by the 1996 Amendments, the Safe Drinking Water Program has developed a strategic plan for the Capacity Development Program, which provides direction to the long range goals of the effort. In addition, associated grant work plans are developed on a rotating three year time schedule to focus on the specific efforts needed to accomplish the goals of the strategic plan. The rotating three year approach is used to keep consistency in the year to year work efforts.

Both the strategic plan and the work plans focus on three key areas – new public water systems, existing public water systems, and program administration. For new drinking water systems, the program focuses on a review of the technical, managerial, and financial capacity of the proposed system, to ensure the system developer is creating a sustainable drinking water system that will be able to provide consistently safe drinking water for years to come. For both new and existing systems, the program has delivered a wide variety of training and technical assistance efforts directed toward helping systems meet their future needs. These efforts, including capacity assessments, assistance programs, coaching, and training have had significant impacts on the capabilities of new drinking water systems.

In state fiscal year 2011, Colorado received nearly \$3.3 million (20% of the \$16.5 million DWSRF capitalization grant) from EPA in water infrastructure funding because the state is implementing a program that aligns with requirements of the SDWA. This funding was down from nearly \$5 million (20% of the \$25 million DWSRF capital grant) in fiscal year 2010. If cuts continue, many of the services described in this report, designed to help public water systems achieve and maintain technical, managerial, and financial capacity to provide continuously safe drinking water to the public, will not be sustainable.

Colorado typically exceeds the national goal that 94 percent of the population served by community water systems receives water that meets all health-based standards. Still, Colorado experienced a waterborne salmonella outbreak in Alamosa in March 2008 that sickened over 1,300 people and resulted in one fatality, and many small rural water systems face ongoing struggles with high levels of naturally occurring radionuclides like uranium and radium in their source water. In addition, an aging workforce is placing new demands on workforce development and increasing the need for high quality and affordable training for drinking water operators.

The Safe Drinking Water Program anticipates the continued use of DWSRF capitalization grant funds to fully implement Colorado's Capacity Development Program and to help public water systems achieve and maintain technical, managerial, and financial capacity. We take our stewardship of these financial resources very seriously and we are increasingly using data to direct our decisions on work plan priorities. It is important to us that our decisions are transparent and that priorities are well-defined and well-communicated. The Capacity Development Program will continue to evolve as the program evaluates its successes and failures, and as small drinking water systems face new challenges in complying with new and revised regulations.

1.0 Introduction

The Safe Drinking Water Program of the Water Quality Control Division (WQCD) of the Colorado Department of Public Health and Environment (CDPHE) has developed this report to provide an overview of the Capacity Development Program, as required by the Safe Drinking Water Act (SDWA). The report is directed toward the Governor of the State of Colorado, but provides an excellent basis for anyone else to understand the structure and effectiveness of the Capacity Development Program.

Capacity Development is a frequently misunderstood term, because it sounds like it is building infrastructure. Rather than building infrastructure, the Capacity Development Program is designed to build capabilities in public water systems to provide continuously safe drinking water to their customers. The program is not designed to build physical infrastructure, but to enhance the ability of the water system to manage and operate their existing infrastructure effectively, and to identify those situations where infrastructure changes are essential. Capacity has three components:

- Technical – Physical infrastructure and operational ability.
- Managerial – Personnel expertise and institutional and administrative capabilities.
- Financial – Monetary resources.

The Colorado Capacity Development Program is funded from several sources that are integrated into one comprehensive program. The funding for these efforts includes several specific set-asides from the Drinking Water State Revolving Fund (DWSRF) capitalization grants, specifically the Program Management Set-Aside, the Local Assistance and Other State Programs Set-Aside, and the Small Systems Training and Technical Assistance Set-Aside. In addition, Colorado received a one-time grant from EPA, the Operator Certification Expense Reimbursement Grant, which is also used in an integrated manner to provide resources to develop training materials, technical assistance, and a program to reimburse new operators for the cost of their certification.

This report includes:

- Section 2.0 - An overview of the Safe Drinking Water Act and the 1996 Amendments which included provisions for the creation of the Capacity Development Program;
- Section 3.0 - A description of Colorado's Capacity Development activities during fiscal years 2009 through 2011;
- Section 4.0 - A discussion of the efficacy of Colorado's Capacity Development Strategy; and
- Section 5.0 – Summary and conclusions.

The previous 2008 Drinking Water Capacity Development Program Report to the Governor is available if additional historic information is desired. This report can be found online at <http://www.cdphe.state.co.us/wq/drinkingwater/CBUReportsPublications.html>. This website also lists documents and resources related to Capacity Development.

2.0 Overview of the Safe Drinking Water Act

The Safe Drinking Water Act, originally enacted in 1974, established a national program to ensure the safety of drinking water supplied to the public by public drinking water systems. The Act's original emphasis was directed primarily at establishing maximum contaminant levels (MCLs) in the water delivered at the consumer's tap. It also provided grant funding and authority for states to implement the Public Water System Supervision program after receiving Environmental Protection Agency (EPA) approval called "primacy."

The Safe Drinking Water Act was significantly amended in 1986 to improve control of microbiological contaminants, control organic contaminants from natural and man-made sources, control sources of contamination after water treatment and during distribution, and to encourage protection of sources of drinking water.

The regulations developed by EPA to address the requirements of the 1986 amendments began the transition to a set of significantly more complicated regulations than their predecessors. But the sea change for the Safe Drinking Water Act and its implementing framework arrived with the 1996 amendments. In addition to continuing the traditional regulatory approach on a more demanding schedule, the 1996 amendments established a strong new emphasis on preventing contamination, and preventing the formation of new systems without adequate technical, managerial, and financial capacity; it also provided funding for the associated costs through a new and unique approach: the use of set-asides from the newly authorized revolving fund capitalization grant. This emphasis transformed the previous law, which had an after-the-fact regulatory approach, into a statute that recognized the need for and provided capital resources to prevent the multiple risks of contamination that threaten the public's drinking water. Four explicit themes characterize the 1996 SDWA amendments:

- Making more and better information about drinking water available to consumers;
- Improving drinking water regulation development with better science, risk assessment and prioritization of effort;
- Providing new funding for infrastructure construction through the DWSRF, and for state drinking water programs through use of set-asides from the loan fund capitalization grant; and
- Encouraging new and stronger approaches to prevent drinking water health risks through source water protection, operator certification and capacity development programs.

A fifth theme, not clearly visible, is also woven into the Act's 1996 amendments: the need for significantly increased resources for states to adopt and implement a vast array of new and highly complicated regulations and administrative requirements. State programs are required to accomplish these tasks or face losing either primary enforcement authority or a substantial portion of their capitalization grant under the DWSRF provisions of the Act's 1996 amendments.

2.1 Required State Activities

The Safe Drinking Water Act requires that certain activities, including but not limited to adopting regulations that are at least as stringent as new or amended federal regulations and having adequate procedures for enforcement of such regulations, are mandatory in order for states to maintain primacy. If a state fails to perform these activities, EPA is required to revoke the state's primary enforcement authority, and all associated federal funding (together the federal program grant and capitalization grant to Colorado was nearly \$18 million in fiscal year 2011) to support the Safe Drinking Water Program. Colorado public water systems would still be subject to compliance with all of the national primary drinking water regulations, but the state would not have the resources to provide compliance assistance or infrastructure improvements.

Colorado has completed all mandatory activities required under the Safe Drinking Water Act to maintain EPA's approval of the State's primary enforcement authority and to develop and maintain the Colorado Capacity Development Program.

2.2 Voluntary State Activities

In addition to the mandatory activities, there are certain activities that are described in the 1996 SDWA amendments as voluntary. These activities include the state operator certification, revolving loan fund and Capacity Development programs.

Failure to implement these activities would not result in loss of Colorado primacy, but would result in losses to the capitalization grant. In 2011, failure to implement a Capacity Development strategy would have resulted in a loss of nearly \$3.3 million in federal infrastructure funding for Colorado. The State has determined that it would cost less to implement the voluntary activities than would be lost in federal grant funds. More importantly, the voluntary activities represent essential components of a public health program based on *prevention* of human health impacts rather than after-the-fact correction:

- **Operator Certification** – The Colorado Operator Certification Program provides oversight of the nearly 7,000 certified operators for water and wastewater facilities throughout the state. These activities include management of the testing and certification of new operators and upgrade of the requirements for existing operators, recertification of existing operators, and discipline of operators who violate provisions of their license. In addition, systems that do not employ properly certified operators are subject to enforcement.
- **Drinking Water State Revolving Fund (DWSRF)** - The Safe Drinking Water Act, as amended in 1996, established the DWSRF to make funds available to drinking water systems to finance infrastructure improvements. The DWSRF is managed by a partnership consisting of WQCD staff, the Department of Local Affairs and the Colorado Water Resources and Power Development Authority. This

partnership has proven effective for the State of Colorado, and enhances the integration of the DWRP with other loan and grant programs supported by the State or other Federal Agencies.

- **Capacity Development Program** – The Safe Drinking Water Program has implemented a Capacity Development Program that aligns with the requirements of the SDWA. The Safe Drinking Water Program’s Capacity Building Unit (CBU) maintains the Capacity Development Strategy and set-aside work plans approved by the EPA.

2.3 Capacity Development Strategy

As part of a Capacity Development Program, the 1996 SDWA Amendments require that states develop a Capacity Development Strategy to help public water systems achieve and maintain technical, managerial, and financial capacity. In Colorado, this strategy serves as the foundation of several work plans that are developed each year to guide program activities. Colorado’s Capacity Development Strategy is revised regularly, most recently in June 2008 (and approved by EPA in July 2008).

The current strategic plan is focused on three key areas: program administration, new drinking water systems, and existing drinking water systems. The plan has nine strategic goals, each directing efforts toward one or more of these key areas:

Strategic Goal 1 – Provide a system of education, training, and technical assistance that provides assurance to the public that the drinking water provided to them by their public drinking water system is consistently safe.

Strategic Goal 2 – Develop and apply a measurement system for all Capacity Development Projects to ensure the program has a measurable and documented beneficial impact on public health, compliance rates, and public trust in the state drinking water program and in their own public water supplier.

Strategic Goal 3 – Apply a proactive approach to systems of concern, so these systems are provided the tools and resources needed to regain compliance and full capacity.

Strategic Goal 4 – Develop a program that will support collaboration among all drinking water systems, assist those smaller systems understand their problems and potential solutions, and use performance based approaches to developing training.

Strategic Goal 5 – Use available resources in an efficient and timely manner, with a focus on continuous improvement of the program.

Strategic Goal 6 – Develop and distribute an effective needs assessment to drinking water systems of Colorado, evaluating the technical, managerial and financial needs, capital needs, and impact of shortfalls on system performance on the health of the populations served.

Strategic Goal 7 – Integrate sustainability into program projects wherever possible, to ensure that resource expenditures develop ongoing programs that provide measurable impacts, and do not result in only short-term, single project outcomes.

Strategic Goal 8 – Ensure all new and proposed new systems are developed with adequate technical, managerial, and financial capacity to remain a viable and sustainable drinking water system into the foreseeable future.

Strategic Goal 9 – Establish and foster partnerships with other federal, state, and local drinking water organizations.

The specific Capacity Development Program activities designed and implemented to achieve the goals contained in the Capacity Development Strategy are described in Section 3.0.

3.0 COLORADO CAPACITY DEVELOPMENT PROGRAM ACTIVITIES

As part of the Capacity Development Program, Colorado is required to provide EPA with DWSRF set-aside work plans that describe the activities designed to achieve the goals contained in the Capacity Development Strategy. Individual work plans are developed for the State Program Management Set-Aside, the Local Assistance and Other State Programs Set-Aside, and the Small System Training and Technical Assistance (SSTTA) Set-Aside. EPA reviews and approves each work plan. Colorado also identifies work plan activities and costs in the state's annual Intended Use Plan for the Capitalization Grant, which is presented to, and approved by the Water Quality Control Commission. This allows the state to charge associated program costs to the various set-asides.

Work plan development occurs on a three-year schedule to allow for flexibility in the staging of projects. Work plans often continue many of the elements of the previous work plan periods to allow for the continuity of capacity development activities.

It is important to note that in recent years, work plan development has been guided by the results of the Safe Drinking Water Program's *Failure and Root Cause Analysis Project (FRCA) Report*¹ which identifies and evaluates trends in compliance failures at public water systems in Colorado. The FRCA report summarizes compliance data collected at Colorado public water systems over a three-year period, from July 1, 2005, through June 30, 2008. The report highlights the areas of greatest weakness at water systems, and thereby helps to direct the use of resources to obtain optimal results. The FRCA report also provides valuable baseline data for comparing, measuring, and evaluating the effectiveness of capacity development program activities in years ahead.

The following sections describe the capacity development activities of the Safe Drinking Water Program, including the Capacity Building Unit, Compliance Assurance Section, and the Engineering Section. Select capacity development activities of the WQCD's Watershed Program, which are incorporated into the DWSRF set-aside work plans, are also described.

3.1 Safe Drinking Water Program – Capacity Building Unit

The goal of the Safe Drinking Water Program's Capacity Building Unit (CBU) is to provide training, technical assistance, and management support services to public water systems so they can strengthen their abilities to supply safe drinking water to the public. In this function, CBU directly provides services

¹ Oxenford, Jeff and Williams, Sharon Israel, Capacity Building Unit, Safe Drinking Water Program. September 2009. *Failure and Root Cause Analysis Final Report*. Available for download at: www.cdphe.state.co.us/wg/drinkingwater/CBUReportsPublications.html

through the Capacity Coaching Work Group, Security and Emergency Preparedness Program, and Drinking Water Excellence Program, and utilizes DWSRF set-asides and other EPA grants to retain contractors to provide additional services.

➤ **Capacity Coaching Workgroup**

The CBU's *Capacity Coaching Workgroup*, includes two Capacity Coaches with operator certifications in water treatment and distribution systems. The Capacity Coaches provide on-site training and technical assistance to small systems throughout Colorado. Coaching priorities include ensuring adequate disinfection, supporting the development of monitoring plans, and coaching select systems in need of in-depth capacity-building support. Over the past two years, the Capacity Coaches have visited over 264 (approximately 13 %) of all small public water systems in Colorado, averaging 10 site visits per month. During each site visit, the Capacity Coaches work closely with water system owners and operators to troubleshoot and improve system water performance, address technical questions, explain complex regulatory requirements, and resolve system deficiencies identified through sanitary surveys. The Capacity Coaches have prepared over 360 technical assistance summary reports resulting in resolution of hundreds of significant deficiencies. By working with and mentoring CBU summer student-interns, the coaches have lead the completion of over 132 site-specific monitoring plans for small water systems.

The Capacity Coaches also support and conduct a wide variety of special projects, workshops, and group training efforts requiring specialized technical experience. For example, the coaches are members of two Safe Drinking Water Program compliance teams focused on evaluating and resolving high-profile compliance issues. The coaches routinely represent the CBU in training activities with the Rocky Mountain Water and Wastewater Plant Operators School, the Colorado Rural Water Association (CRWA), and the American Water Works Association (AWWA). They also provide invaluable technical support in the conception, development, and facilitation of new workshops for small water system operators.

➤ **Security and Emergency Preparedness Program**

The CBU's *Security and Emergency Preparedness Program* ("Security Program") promotes security and all-hazards preparedness throughout the state's drinking water community. Program elements include educating the drinking water community through courses, workshops, exercises, and information exchange; providing tools and resources for developing and implementing emergency planning capabilities; and fostering partnerships through Colorado's Water/Wastewater Agency Response Network (CoWARN) and National Incident Management System (NIMS) initiative.

- CoWARN garnered national attention in March of 2008 when its network of members successfully responded to a waterborne salmonella outbreak in Alamosa, Colorado. This marked the first time that a WARN was used for a system-wide contamination event by a waterborne pathogen and changed the mindset that WARNs were only beneficial for responding to natural disasters.
- The Security Program continues to support utilities by maintaining and hosting the CoWARN web site, sponsoring meetings, participating in steering committee decisions, providing

resources and tools in the areas of security and emergency preparedness, and providing training.

- NIMS provides a consistent nationwide approach for state, local, and non-governmental organizations to work together to prepare for, respond to, and recover from domestic incidents. The Security Program brings NIMS training to its stakeholders by hosting courses developed and offered by EPA, Department of Homeland Security (DHS), and Urban Area Security Initiative (UASI).

➤ **Drinking Water Excellence Program**

The CBU's *Drinking Water Excellence Program* promotes treatment process optimization and provides training and recognition for surface water treatment facilities in Colorado. The Excellence Program currently offers three advanced operator training workshops designed to provide an advanced and highly specialized technical training opportunity for "A" and "B" certified drinking water operators. The workshops focus on evaluating the capacity of water treatment processes, identifying and prioritizing performance limiting factors, and managing water quality data to aid in the support of treatment decisions and treatment optimization. The program offers performance based training based on the EPA Area Wide Optimization Program Model. This training helps address the common performance limiting factors identified in surface water treatment plants, improves the participant's water quality through plant optimization techniques, and promotes peer-to-peer learning.

➤ **Operator Reimbursement Project**

In Colorado, drinking water treatment and water distribution operators pay application, examination and administration fees totaling \$115 for their certifications. The goal of Colorado's reimbursement project, managed by the CBU and funded under the ERG, is to offset these expenses by reimbursing the \$115 certification cost to certified water treatment and water distribution operators. In addition, eligible operators are reimbursed an additional \$115 to cover travel costs and ancillary training expenses associated with each certification. The Safe Drinking Water Program and Colorado's Operator Certification Program staff work together to receive applications and manage the disbursement of the funds. This project benefits operators who have successfully completed certification testing in water treatment and water distribution, and who apply for the reimbursement following division guidelines.

➤ **Training Partnerships**

Safe drinking water doesn't happen without a well-trained workforce. The CBU leverages DWSRF set-asides to support and leverage training and technical assistance partnerships with a diverse group of Colorado businesses, agencies, schools, and nonprofit organizations statewide. In July 2010, the Capacity Building Unit prepared the *2015 Public Water System Training Strategy*² to establish the vision

² Williams, Sharon Israel, Capacity Building Unit, Safe Drinking Water Program. July 2010. *Colorado 2015 Public Water System Training Strategy*. Available for download at: www.cdphe.state.co.us/wg/drinkingwater/CBUReportsPublications.html

for Colorado public water system training services through 2015, and to direct the CBU's annual work planning and priority setting related to public water system training. This training strategy is the culmination of a 12-month, four-phase project designed to 1) assess the most common failures at Colorado's public water systems, 2) establish a baseline and preliminary gap analysis of existing training and technical assistance services for public water systems, 3) convene a Roundtable of technical assistance providers to collect critical input from the training community, and 4) apply project results to develop a five-year strategic plan for training services.

The 2015 Strategy establishes the following five overarching goals:

Goal 1: Set Standards for High Quality Courses

Goal 2: Define Core Curriculum

Goal 3: Support Statewide Training

Goal 4: Coordinate Training Offerings and Schedules

Goal 5: Cultivate a Supportive Learning Environment

The implementation of the 2015 training strategy is reflected in the following training and technical assistance partnerships:

Short Schools - Two short schools, the *Rocky Mountain Water and Wastewater Plant Operator School* and the *Colorado Distribution and Collection Systems School*, are hosted by training partners at the University of Colorado at Boulder - College of Engineering, and are offered in Boulder, Colorado each year. In addition, the *Leadville Operators Training Conference*, hosted by training partners at the *Colorado Mountain College*, the *Rocky Mountain Section of the American Water Works Association (RMSAWWA)*, and the *Rocky Mountain Water Environment Association (RMWEA)*, are offered in Leadville, Colorado each year. Each school is typically four or five days in length, and covers either basics or advanced programs in drinking water treatment or distribution system management. These schools have operated with State subsidies offered through the DWSRF set-aside funds in order to keep participant registration fees relatively low.

Mobile Training Unit - In order to meet the needs of many small system operators scattered in remote areas of the state, the CBU applies funds from Colorado's allotment under the Operator Certification Expense Reimbursement Grant Program (ERG) to support the *Colorado Rural Water Association (CRWA)* in the development of a mobile training unit (MTU). The MTU consisting of a well-equipped 20-24 foot trailer that serves as a "training lab on wheels." The MTU contains cabinetry and counters for wet chemical testing, equipment repair, water quality monitoring, etc. It also has appropriate fixtures and scale model equipment to instruct students in the common operational and maintenance activities of public water systems. The scope of this training project includes the development of specific training modules for the MTU and the hiring of an instructor skilled in the delivery of training in a hands-on, small class environment.

Distribution System Training - The CBU applies funds from the ERG to support the development of distribution system management training focused on the needs of water operators in rural Colorado. The Colorado Distribution Operator Training Series (DOTs) includes three training courses spanning five

days, offered cost-free and close-to-home for water system operators across the state. Workshops attendees receive in-depth, hands-on instruction on topics including water main breaks, storage tank maintenance and management, and sampling techniques, and preventing cross-connections. Since the workshops development in Spring 2010, operator demand for the classes has consistently exceeded the available class space.

Monitoring Plan/TMF Training Workshops – The 2009 Failure and Root Cause Analysis Report (see Section 2.0) showed that the absence of monitoring plans and the failure to monitor were the most common causes of compliance violations and sanitary survey deficiencies among small water systems. Without monitoring, it is impossible to determine 1) if the water is safe and 2) if small system operators understand and are applying the practices that ensure safe drinking water. To address these issues, the CBU has retained a contractor to develop and provide a day-long monitoring plan workshop designed to help small groundwater systems owners and operators develop, understand, and implement a complete a monitoring plan for their system. This training series is combined with a second day-long workshop focused on providing tools and resources for building technical, managerial, and financial (TMF) capacity for small water systems.

CSU Tank Baffling Factor Study - In Colorado, many small water systems are faced with difficult decisions regarding the ability of their current treatment system design to meet the requirements for adequate disinfectant “contact time” for their disinfection process. The CBU has partnered with Colorado State University (CSU) on a three-year study focused on treatment system designs that enhance contact time and provide simple guidance to water systems for providing adequate contact time from existing or new tanks. The results of this project will provide significant time and cost savings for small business owners across the state.

Distribution Systems Training Center - Beginning in 2009, the CBU partnered with Red Rocks Community College in Lakewood, Colorado to design and construct a hands-on training facility for water distribution operators. Construction is slated to be completed by the end of 2011, and the development and delivery of a series of distribution system training courses will follow shortly thereafter. Many public water systems have committed to donating materials and in-kind services to this project, including Denver Water and Consolidated Mutual Water District.

Training Seminars and Conferences- The CBU utilizes DWSRF set-asides to support a variety of seminars, conferences and workshops for water operators. The organizations hosting these events are not-for-profit associations, not-for-profit assistance organizations, and regional community colleges, as well as many for profit organizations (e.g., consulting engineering firms). Training topics include: water treatment, distribution system operations, sampling, and water system operation and maintenance.

3.2 Safe Drinking Water Program – Compliance Assurance Section

The Compliance Assurance Section (CAS) monitors compliance with water quality laws and regulations, detects non-compliance, and responds to violations quickly, fairly and consistently in order to limit harm

to the public and the environment. CAS also drafts new rules for adoption by the Water Quality Control Commission as the Colorado Primary Drinking Water Regulations, and communicates regulatory requirements to public water systems through stakeholder processes and compliance assistance and training activities.

Rule Managers and *Planning Specialists* located within CAS support the technical, managerial, and financial capacity development of public water systems through a variety of compliance assistance and customer service activities.

- *Rule Managers* within CAS are responsible for designing and implementing system-specific monitoring and compliance programs for new regulations, communicating effectively with water systems so they understand their compliance responsibilities, assisting with promulgation of Colorado Primary Drinking Water Regulations, implementing the State's program to ensure public water systems are monitoring in accordance with requirements, and developing and presenting materials to support the Safe Drinking Water Program's formal enforcement efforts.
- *Planning Specialists* (formerly known as early implementation specialists) develop policy and guidance documents to accompany existing and new regulations, and provide training to drinking water systems to prepare them to meet the requirements of the new regulations, including the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage2), and the Groundwater Rule (GWR).

CAS plays a critical role in identifying systems that are failing to comply with drinking water regulations and assuring that these systems return to compliance. CAS also identifies systems that are at risk of not complying with new rules and acts to prevent non-compliance by proactively readying systems for new requirements. CAS activities may involve providing direct training and technical assistance, partnering with CBU to offer on-site coaching assistance, collaborating with the Engineering Section to develop system-specific return to compliance plans, or referring "systems of concern" to one of three Cross-Program Compliance Teams for focused assistance and tracking. Cross-Program Compliance Teams exist to leverage and focus program resources on water systems with persistent disinfection, disinfection byproduct, and/or radionuclide issues.

In late fiscal year 2009, CAS re-directed compliance oversight resources to the new Policy and Planning Unit in order to strengthen the Program's efforts to improve compliance rates for new rules. The unit has trained more than 1,000 certified operators, consultants and managers representing multiple public water systems across the state. Early training and outreach activities have contributed to high rates of compliance for three new rules: 98% of affected systems are in compliance with the new Long Term 2 Enhanced Surface Water Treatment Rule, the new Stage 2 Disinfection Byproducts Rule and new requirements of the federal Groundwater Rule.

3.3 Safe Drinking Water Program – Engineering Section

The Engineering Section (ES) conducts a wide range of activities to ensure the technical, managerial, and financial capacity of new and existing public water systems. These activities are an integral part of Colorado's Capacity Development Program.

For all new water systems and water systems applying for loans under the DWSRF, the ES completes a mandatory capacity review of the water system. The ES refers to the *New Water System Capacity Planning Manual* to identify the criteria new community and non-transient non-community public water systems must meet in order to be approved for operation. Meeting the capacity review requirements ensures that the system will operate into the future with fewer difficulties, be financially secure, and be managed with the best interests of the water users in mind.

For existing water systems, capacity is routinely evaluated through sanitary surveys and compliance evaluations. *Staff and District Engineers* within ES conduct sanitary surveys of public water systems, review public water system designs for conformance with design criteria; prepare and distribute technical assistance materials, and track system compliance with follow-up requirements. Each year, ES engineers conduct over 300 on-site sanitary surveys of community water systems, while the *Non-community Groundwater System Inspection Coordinator* oversees the field evaluations of approximately 185 non-community groundwater systems through contracts with Local Health Departments and counties utilizing set-aside funds. While conducting the on-site surveys, ES engineers provide system owners and operators with technical assistance on operation and maintenance of the water system and suggest ways to eliminate any identified sanitary deficiencies. Site visits are followed by a report identifying any deficiencies and a notice to correct these problems.

The ES *Lead Drinking Water Engineer* provides expertise with respect to the technical aspects of Colorado's Primary Drinking Water Regulations and public water system capacity development. Through this role, the ES offers technical leadership and consultation to public water systems on a wide variety of drinking water issues, including drinking water treatment techniques and emerging technologies, drinking water design criteria, drinking water treatment residuals management, technically-challenging design or sanitary survey issues, new Drinking Water Rules, distribution systems, and eligibility and capacity development review process to support the DWSRF loan program.

By taking the lead on using DWSRF set-aside funds to implement Colorado Radionuclides Abatement and Disposal Strategy (CO-RADS), the ES has focused capacity development resources on small, rural water systems with high levels of naturally occurring radionuclides such as uranium and radium in their source water. CO-RADS is providing these communities with sophisticated and state-of-the-art technical assistance that they otherwise would not be able to afford on their own. CO-RADS assists water systems in understanding the full scope of the problem they face, from searching for alternative source waters, treating the water to remove the contaminants, disposing of the waste generated by the treatment process, and providing public education to their consumers to understand the health implications of the

problem, the costs of remediation, and their role in protecting public health.

3.4 Watershed Program

The 1996 Safe Drinking Water Act Amendments directed that each state develop a Source Water and Assessment (SWAP) program. The WQCD's Watershed Program has developed and implemented a SWAP program designed to provide the public consumer with information about their drinking water, as well as provide the community a way to get involved in protecting the quality of their drinking water. In the first phase of the SWAP program, the Watershed Program conducted an assessment of all Colorado public water supplies, which provided an understanding of where each public water system's source water comes from, what contaminant sources potentially threaten the water source(s), and how susceptible each water source is to potential contamination. In the second phase of the SWAP program, public water systems are encouraged to develop and implement a Source Water Protection Plan which incorporates community-based involvement and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.

Within the Watershed Program's Restoration and Protection Unit, the *SWAP Coordinator* manages and implements the Integrated SWAP Project Plan (ISWAP), the Colorado Wellhead Protection program, and a statewide grant program providing technical and financial support for protection planning activities. Through the statewide grant program, the SWAP Coordinator provides lead source water protection entities with grant funding or technical assistance opportunities, including:

- Protection Plan Pilot Project Grants
- Protection Plan Development and Implementation Grants
- Protection Plan Development Technical Assistance
- Susceptibility Analysis Continuation/New Source Water Assessment Area Delineations/SWAP Report Generation
- Safe Drinking Water Information System (SDWIS) and Other Data and Analysis Tools Improvements.

Also within the Restoration and Protection Unit, *Non-Point Source Project Coordinators* provide technical expertise and assistance to local watershed initiatives, local governments, and community and non-community drinking water systems in obtaining technical and financial assistance to develop and implement source water protection plans.

To date, the SWAP program has provided technical and financial assistance to complete development and implementation of grant applications for 64 public water systems encumbering \$396,850. The SWAP program has reported 44 substantially implemented protection plans covering approximately 550,000 Colorado citizens (EPA 2011 Performance Accountability Report). Currently, the statewide number of public water systems in some stage of protection planning development is 157.

4.0 EFFICACY OF THE COLORADO CAPACITY DEVELOPMENT STRATEGY

Colorado's Capacity Development Strategy has been an effective tool in guiding the development and implementation of capacity development activities designed to assist public water systems in building and maintaining technical, managerial, and financial capacity. The incorporation of the strategy into the WQCD Safe Drinking Water Program's major program activities and the daily work of staff maximizes the program's influence and efficacy.

Some specific outcomes from implementing Colorado's Capacity Development Strategy highlighted in this report include:

- The provision of one-on-one technical assistance "coaching" site visits to over 264 small public water systems in Colorado since May 2009.
- Coaching assistance leading to the completion over 132 site-specific monitoring plans for small water systems.
- The implementation of the Capacity Building Unit's *Security and Emergency Preparedness Program*, *Drinking Water Excellence Program*, and *Operator Reimbursement Project*.
- The development and implementation of the *2015 Public Water System Training Strategy* to establish the vision for Colorado public water system training services and to support statewide training partnerships including: Short Schools for water operators, the Colorado Rural Water Mobile Training Unit, distribution system training, monitoring plan/TMF training workshops, the Colorado State University Tank Baffling Factor Study, the Red Rocks Community College Distribution Systems Training Center, and a variety of statewide training seminars and conferences.
- The review and resolution of persistent disinfection, disinfection byproduct, and/or radionuclide issues by Cross-Program Compliance Teams.
- The provision of early training and outreach activities contributing to high rates of compliance for the new Long Term 2 Enhanced Surface Water Treatment Rule, the new Stage 2 Disinfection Byproducts Rule, and new requirements of the federal Groundwater Rule.
- The annual completion of over 300 on-site sanitary surveys of community water systems and oversight of approximately 185 field evaluations of non-community ground water systems.
- Implementation of the Colorado Radionuclides Abatement and Disposal Strategy (CO-RADS) to focus capacity development resources on small, rural water systems with high levels of naturally occurring radionuclides such as uranium and radium in their source water.
- The provision of technical and financial assistance to complete source water protection grant applications for 64 public water systems encumbering \$396,850; and to implement 44 source water protection plans covering approximately 550,000 Colorado citizens.

Under the scope of the Capacity Development Program, the WQCD has begun to more effectively utilize data to identify issues that drinking water systems face, direct training and technical assistance resources to the identified issues, coordinate solutions with training partners and stakeholder organizations, and report changes and outcomes to relevant parties. One example of becoming more data-driven is the recent development and application of the *2009 Failure and Root Cause Analysis Project (FRCA) Report* (Section 2.0) to assess compliance rates at public water systems and evaluate the overall effectiveness of the Capacity Development Program. Ongoing efforts will enable the Safe Drinking Water Program to better track, evaluate, and report on:

- Noncompliance rates of new public water systems that were approved after October 1999, and that were the subject to the complete technical, managerial and financial capacity review prior to approval.
- Annual noncompliance rate comparisons.
- Increases in the number of sanitary surveys or other on-site evaluations conducted using Capacity Development funds.
- Decreases in the number of deficiencies identified during site visits, and increases in the number of deficiencies resolved.
- The effectiveness of on-site third-party training and technical assistance in helping systems achieve and maintain compliance.
- Effectiveness of compliance teams in assisting systems with compliance difficulties to resolve their problems.
- Changes in the compliance status of systems listed as significant non-compliers as defined by EPA.

The Safe Drinking Water Program has also successfully used DWSRF set-aside work plans to coordinate and communicate the key issues that the program intends to address and how set-aside funds will be used to support program initiatives. Strategic work plan development and implementation has directly contributed to the achievement of Safe Drinking Water Program Strategic Plan goals and measures, including but not limited to:

- Ninety-eight percent (98%) of the population served by community public drinking water systems receives drinking water that meets all health-based standards.
- Ninety-five percent (95%) of community public drinking water systems meet all health-based standards.
- Less than five percent (5%) of community public drinking water systems have unresolved significant deficiencies.
- Eighty percent (80%) of public water systems are in compliance with all regulatory requirements.

5.0 Summary and Conclusions

The 1996 SDWA amendments presented many challenges to the Colorado Safe Drinking Water Program, including new regulatory requirements, source water protection, operator certification, revolving fund and Capacity Development Program requirements. The amendments also presented many challenges to the drinking water systems of the state, challenges that many smaller systems have a difficult time addressing. However, the amendments also provided states with a funding mechanism to augment state and other federal funding to complete the many tasks required of the state. This mechanism includes specific set-asides from the Drinking Water State Revolving Fund (DWSRF) capitalization grant that provide funds for capacity development, program management, wellhead protection, and small system training and technical assistance. Colorado has developed and implemented a robust Capacity Development Strategy to use set-asides to support public water systems so they can strengthen their ability to supply safe drinking water to the public.

This report has provided details on the use of these set-aside funds to accomplish these tasks, and demonstrates that it is in Colorado's best interest to continue to support these efforts, provide the necessary state funds to keep the drinking water programs effective and viable, and to continue to support program growth with the necessary state resources to make all public water systems in the state a strong, integral part of the state's public health protection efforts.

➤ **Retention of Drinking Water Program Primary Enforcement Authority**

The Colorado Capacity Development Program is one part of the overall Safe Drinking Water Program and federal funding will not be available to fund its activities unless Colorado retains primary enforcement authority for the SDWA. The Safe Drinking Water Program staff have continued to meet all EPA requirements to retain primary enforcement authority. This ensures that Colorado public water systems receive the benefit of services that offer helpful assistance and encourage compliance. The Safe Drinking Water Program will continue to implement all activities under the SDWA to ensure full federal funding.

➤ **Retention of Capacity Development Set-Aside and Full Capitalization Grant Allotment**

In addition to the requirements to retain primary enforcement authority, there are requirements that must be met in order to retain the Capacity Development Program, and the related set-aside funding and the full allotment for the capitalization grant. These requirements include the development, and subsequent approval by EPA of a current Capacity Development strategy, work plan, and implementation report. Inadequate response in any of these areas can result in EPA withholding a portion of the capitalization grant. Colorado has successfully complied with all requirements of this program during the three years of this report period.

➤ **Future Challenges**

Of all of the challenges facing the program, the most important is adequate program funding. In the past, state drinking water programs with primary enforcement authority received federal funding only through an annual Performance Partnership grant, but the 1996 SDWA amendments provided additional funding through the annual federal capitalization grants. In state fiscal year 2011, Colorado received nearly \$3.3 million (20% of the \$16.5 million DWSRF capitalization grant) from EPA in water infrastructure funding because the state is implementing a Capacity Development Program that aligns with requirements of the SDWA. This funding was down from nearly \$5 million (20% of the \$25 million DWSRF capital grant) in fiscal year 2010. If cuts continue, many of the services described in this report, designed to help public water systems achieve and maintain technical, managerial, and financial capacity to provide continuously safe drinking water to the public, will not be sustainable.

Regulations cannot cover all contingencies, monitoring is not continuous but fixed in time, and enforcement actions are only taken after a problem has occurred. Regardless of the regulations, monitoring, assistance, and enforcement, the only way to assure continuously safe drinking water and sustainable drinking water systems is to ensure that all systems have technical, managerial and financial capacity and operate at the very best of their capabilities, and to support and empower operators and managers to strive for excellence in their daily operations.