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Executive Summary

In the 1996 Amendments to the Federal Safe Drinking Water Act (SDWA), Congress mandated that states develop capacity development strategies for both new and existing water systems to enhance their ability to provide safe drinking water. **It should be noted that the term “capacity” in the context of the SDWA does not refer specifically to the ability of a water system to supply an adequate quantity of water to its users. The term actually has a broader meaning and instead refers to the overall technical, managerial and financial capability of a water system to maintain its infrastructure and meet its operating costs.** These strategies are aimed at helping water systems acquire and/or maintain the technical, managerial, and financial (TMF) abilities needed to properly operate, manage and finance their systems. With the assistance of a stakeholder group of state agencies, public water suppliers, technical assistance providers, local government representatives, and environmental groups, the Vermont Drinking Water & Groundwater Protection Division (now the Drinking Water & Groundwater Protection Division) issued its initial Capacity Development Strategy Report on August 28, 2000.

The SDWA, as amended in 1996, brought significant improvements to the national drinking water program. Capacity development is an important component of the Act's focus on mitigating drinking water issues. Capacity development provisions offer a framework within which States and water systems can work together to ensure that systems acquire and maintain the TMF capacity needed to achieve the public health protection objectives of the SDWA.

Vermont's existing-system strategy focuses on working with challenged water systems that lack adequate capacity through a variety of assistance efforts including reduced term loans, planning loans, and user rate analysis. Reduced federal dollars has a direct impact on the amount of assistance the Division can provide, either through reduced cost loans or outreach and assistance programs. Systems that lack adequate capacity run the risk of service disruptions, poor quality water, upset customers, and the inability to make necessary, or plan for future, improvements.

As part of the existing-system strategy the Division is embarking on an Asset Management Program pilot. The Asset Management Program pilot's aim is to work collaboratively with the Village of Waterbury to develop an asset management plan and assist with ongoing implementation of an asset management program. Asset Management includes identification of all water system assets, their condition, criticality, level of service, minimum life cycle cost, and long-term funding strategy. Additionally, other components of the existing-system strategy includes board member training, water loss, conservation, efficiency awareness and education, and full-cost pricing. The future direction of the Capacity Development program faces many challenges, most of which are related to money. There is a trend toward a widening gap between ability of Federal and State funding program to assist systems in making necessary improvements. The Division sees distribution system replacement as an emerging issue with local governing bodies not making the tough decisions to charge proper user rates to ensure proper infrastructure replacement.

Vermont's new-system strategy is to prevent any new system from forming that doesn't have the necessary capacity to serve its customers safe drinking water and federal law allows Vermont to do this. There was recent State legislation (2008) that made it easier for (and encouraged) existing, small, capacity-challenged water systems to operationally consolidate with a larger municipality. This strategy is not as extensive as the existing-system strategy because we just don't see an appreciable number of brand new water systems being created.

Our program is working -- Vermonters are getting clean, safe drinking water as a result of the hard work of communities with the oversight of this program. But there are strains on the system. There is a significant unmet need for funding so communities can improve their water systems to replace aging pipes and treatment plants and meet new requirements--part of that need can be met by federal SRF dollars, but some of it must be met by local governments and the state has an obligation to help provide financial and technical assistance to those communities so that they can provide safe drinking water.

Glossary of Terms

Agency of Natural Resources (ANR) is a state agency that encompasses three departments, including the Department of Environmental Conservation (DEC), which is delegated primacy for implementing federal drinking water rules pursuant to the federal Safe Drinking Water Act.

Department Of Environmental Conservation (DEC) is the department that administers most of the Agency's regulatory programs plus several voluntary pollution and waste reduction programs. Program areas include: air quality, environmental assistance, public facilities engineering, geology, environmental permits, solid waste, hazardous waste, surface water quality, watershed planning, stormwater management, drinking water supply, and wastewater management.

Drinking Water and Groundwater Protection Division (DWGPD) is the division that regulates public drinking water systems, has primacy in enforcement of the Safe Drinking Water Act (SDWA), and houses the capacity development program, among others. Note: DWGPD is a recently formed division that includes all former Water Supply Division programs and staff. This report will therefore include references to the Water Supply Division.

Safe Drinking Water Act (SDWA) is the federal law passed by the U.S. Congress in 1974 and amended in 1986 and 1996, which authorizes the United States Environmental Protection Agency and the States to oversee public water systems and set standards for drinking water to protect public health.

United States Environmental Protection Agency (EPA) is the federal agency responsible for overseeing the state drinking water programs.

Enforcement Targeting Tool (ETT) assigns a point value to specific violations for each system to bring attention to drinking water systems with the most serious and unaddressed violations.

Public Water System (PWS) is a water system that is owned or controlled by a person or entity, that provides drinking water through pipes or other constructed conveyances to the public and that has at least fifteen (15) service connections or serves an average of at least twenty five (25) individuals daily for at least sixty (60) days out of the year.

Public Community Water System (PCWS) is a water system that serves at least fifteen (15) service connections used by year-round residents or regularly serves at least 25 year-round residents.

Non-Transient Non-Community water system (NTNC) is a water system that regularly serves at least 25 of the same persons daily for more than six months per year. Examples include: schools, factories, office buildings.

Transient Non-Community water system (TNC) is a water system that serves 25 or more different persons for more than 60 days of the year. Examples include: restaurants, motels, campgrounds.

1. Introduction

The objective of the 1996 Safe Drinking Water Act (SDWA) Amendments (Amendments) was to ensure that public water systems provide safe drinking water to the public. The Amendments seek to mitigate non-compliance and associated health risks by ensuring that public water systems have the capability to produce safe drinking water now and in the future. To achieve these goals, the Amendments included provisions for several prevention programs – one of which is the capacity development program.

Water system capacity is the ability to plan for, achieve and maintain compliance with all applicable drinking water standards. There are three components to capacity: technical, managerial, and financial. Technical capacity refers to a water system's ability to operate and maintain its infrastructure. Managerial capacity refers to the expertise of the water system's personnel to administer the system's overall operations. Financial capacity refers to the financial resources and fiscal management that support the cost of operating the water system. Adequate capability, or capacity, in all three areas is necessary for the successful operation of a public water system.

Capacity development is the process through which water systems acquire, maintain, and build upon their technical, managerial, and financial (TMF) capabilities which enable them to consistently provide safe drinking water to their customers in a reliable and cost-effective manner. Vermont's capacity development program provides a framework for state agencies, local governments, stakeholder groups or organizations, water systems and the public to ensure that drinking water systems acquire and maintain the TMF capacity needed to achieve compliance with applicable State and Federal drinking water regulations.

The purpose of this report is to provide an assessment of the capacity development program in Vermont and the statewide strategy for assisting public water systems. The report highlights progress made toward improving the TMF capabilities of public water systems in Vermont as a result of the Vermont Drinking Water & Groundwater Protection Division's Capacity Development Program.

2. Capacity Development Provisions in the Safe Drinking Water Act

Amendments to the SDWA included three capacity development provisions, outlined as follows:

- 1) All new community water systems and non-transient non-community water systems that begin operation after October 1, 1999 must first demonstrate that they possess adequate capacity to receive a Permit to Construct and Permit to Operate.
- 2) States are prohibited from providing Drinking Water State Revolving Fund assistance to public water systems that lack adequate capacity, unless that financial assistance is directly related to improving the system's technical, managerial or financial capacity.
- 3) States must develop and implement a strategy to assist existing public water systems in acquiring and maintaining the necessary capacity.

2.1. New Systems Provisions

There has been no change, nor is any currently planned, to Vermont's legal authority to implement the New Systems Program since it was established by state law in 1998.

Vermont's Capacity Development program utilizes a self-developed 'Capacity Review Check-list' to determine when and what a qualifying system needs to complete to demonstrate capacity. For potential CWSs and NTNCs, the checklist is a two-step process, completing items before receiving a Permit to Construct (PTC) and another set of items before receiving a Permit to Operate (PTO). Items on the checklist include, but are not limited to, submittal of a Source Protection Plan, Long Range Plan, project As-Built plans, required sampling plans, and retention of a Certified Operator.

Additionally, to ensure newly permitted water systems are able to maintain capacity, the Capacity Development Coordinator conducts quarterly check-ins with either the design engineer or the applicant to determine where in the construction process the proposed system is. Often this acts as

a reminder to the applicant that their PTC will expire shortly and if they still intend to complete the project they must reapply for a new permit. This is also beneficial to systems that have finished construction and will be serving water to the public by serving as a reminder that more steps need to be completed before they have officially achieved capacity and can receive a PTO.

2.2. DWSRF Loan Applicants Provision

The DWGPD will make a determination on system capacity based on information available in DWGPD records, the priority list application, loan application and, most importantly, completion of a capacity evaluation. A capacity evaluation is a meeting between the applicant, their certified operator, and the Capacity Development Coordinator; often the system's designated engineer and a representative from VT's DWSRF program will also attend.

Components of the capacity evaluation include discussions related to source capability, monitoring and compliance reporting, relationship with the certified operator, water loss, water and energy efficiency, managerial competency, and fiscal responsibility. Discussions regarding financial capacity involve current and projected water rates, delinquent water accounts, and financial long-range planning. The presence of an active organization with identified responsible officials and business practices are considerations in managerial capacity determinations. If a loan applicant is determined to lack capacity in an area, a list of action items will be established and considered a condition of loan forgiveness, if applicable. Otherwise, the action items are recommendations and are usually not significant enough to keep the system from maintaining the technical, managerial and financial (TMF) capacity needed to protect public health and maintain the system.

Many capacity evaluations have resulted in further work with systems on budgeting, user rates and asset management. Additionally, many of our school water systems have had, for the first time, a written contract with their operator. Most of these school-operator relationships evolved over many years and a frequent change in personnel at the school has resulted in lack of communication over who is responsible for what. This lack of clarity has led to rule violations, which, in most cases would have been avoidable had there been better communication.

Another benefit for many water systems is the 'Exit Budget Review' the Capacity Development Coordinator conducts along with the Capacity Evaluation for systems seeking planning and/or construction loan forgiveness. The Exit Budget Review consists of populating a simple spreadsheet where major system assets are listed with their expected useful life, current cost to replace, projected cost to replace at the end of its useful life, and a projected annual contribution to a capital fund. This exercise is often the first time very small systems put the proverbial pen to paper to determine what the system may cost to replace. This is a useful starting place when having discussions with school boards, for example, for annual contribution to a capital improvement fund.

The DWGPD continues to update the survey as needed to reflect the changing needs of the program. More emphasis is now placed on implementation of the action items with consideration being given to withholding planning loan forgiveness, where applicable, until certain capacity milestones are achieved.

2.3. Existing Systems Provision

Ten years have passed since Vermont's Capacity Development Strategy was established and the water system landscape has changed significantly since that time. The Strategy should also reflect this change. In the coming year, the Capacity Development Coordinator, along with stakeholders, will endeavor to update the Strategy, bring new initiatives online and re-invigorate existing ones that are still deemed relevant. The Capacity Development Coordinator completed conversations with those in the Drinking Water & Groundwater Protection Division as to what were some potential emerging, or existing, issues that should be addressed with the new Capacity Development Strategy. Unfortunately, Tropical Storm Irene caused our efforts be put on hold. We are committed to continuing the revision efforts now that we are in our new office location. Despite losing most of our Division's records, notes from internal meetings on program revision survived.

3. Assessment of Capacity Development Strategy

3.1. Vermont Public Water Systems Demographics

At the time this document was developed, there were 1368 public water systems in Vermont that fall into three different categories.

Public Community water systems regularly serve at least 25 year round-residents or have 15 or more connections serving year-round residents. There are 440 systems serving an estimated aggregate population of 444,791. About half of these Community systems are privately owned home-owners associations or mobile home parks; approximately 15 are private-for-profit water systems that are regulated by the Public Service Board and the Department of Public Service.

Non-Transient Non-Community water systems serve at least 25 of the same persons daily for more than six months per year. Schools, factories, and office buildings meet these criteria. There are 242 systems in this category serving an aggregate population of 44,177. More than half of these systems are small rural schools, the remainder are mostly privately owned businesses.

Transient Non-Community water systems serve more than 25 persons a day for at least 60 days during the year. Restaurants, motels, and campgrounds are examples. Approximately 680 systems are classified as transient non-community water systems. Nearly all of the transient systems are privately owned businesses

Additionally, there are approximately 8 water bottling companies whose sources are in Vermont and are regulated by the Drinking Water & Groundwater Protection Division. Also new to our regulated community and unique to Vermont is the large groundwater withdrawal for industrial and commercial entities. Currently, 14 such systems are reporting their water usage. A large groundwater withdrawal is defined as a non-potable water supply source where the withdrawal will be more than 57,600 gallons per day; agricultural uses are exempted.

Regulatory requirements vary for the different types of systems and the major focus of the strategy is on CWSs and NTNCs. Factors weighing on strategy development and implementation are system size and ownership type. Economies of scale for water system operation and maintenance costs vary considerably for systems, with small systems, particularly those undergoing major system improvements, experiencing the highest per user costs. This impedes the ability of volunteer or part-time water boards and operators that run these small systems to maintain compliance with federal and state drinking water standards that continually increase in complexity. The capacity program is focused primarily, although not exclusively, on those most in need of assistance-- the very small community system and small rural school system. A significant number of these systems would not be able to comply with regulatory requirements and protect public health without the technical, managerial and financial assistance provided through an array of capacity building programs. This strategy has proved successful and we are now focusing more on providing managerial assistance to small municipalities and systems on the verge of enforcement action.

Additionally, the capacity program has become increasingly involved in assisting public community water systems regulated by the Department of Public Service and Public Service Board with restructuring into more equitable, user-owned type systems through formation of fire districts. Vermont Statutes allow for the formation of a fire district-- a municipal entity with taxing and bonding authority established for a variety of purposes, which include: sidewalks, street lights, fire protection, water supply, and wastewater. A fire district is given authority to organize and operate by a Town's Select Board or by State legislature. Once formed, the fire district is a sovereign entity in or among town boundaries and establishes a prudential committee, by-laws, collection practices, etc. A town may have an unlimited number of fire districts and are numbered in the order they are formed (1, 2, 3, etc.). A benefit to being a fire district is the potential for more favorable financing terms from our DWSRF program, including access to SRF set-aside programs and the ability to adequately charge for water service without having to obtain Public Service Board approval.

The following table summarizes the number and type of PWSs that fit in various population ranges, clearly showing that a high percentage of water systems in Vermont are very small. EPA defines a small system as one serving less than 10,000 people. Federal and state rules vary depending upon system size, with generally increasingly more stringent requirements with increasing system size. The table below provides a profile of the number of systems in Vermont by system type and population range. Vermont has 7 systems considered large by federal standards; all others are by federal definition, small systems.

Table 1 Vermont Public Water Systems Profile			
Population Range	Community	Non-Transient Non-Community	Transient Non-community
25 - 500	321	227	654
501-3300	85	15	26
3301-10,000	27	0	0
>10,000	7	0	0
Total	440	242	680

3.2. Actions Designed to Reach Capacity Development Objectives and Components

Vermont has a long history of providing both financial and technical assistance to water systems. The 1996 Amendments to the SDWA provided an opportunity to use federal and state dollars to improve and expand this program to more nearly meet the need. Based on public input, Vermont's Existing Public Water System Capacity Strategy was developed and submitted to EPA in July of 2000. Major components of any capacity program are technical and financial assistance, and training opportunities, but the Division is currently focusing on providing managerial assistance as the backbone for overall Capacity Development. We believe emphasis on each of these components will be most successful in ensuring that Vermont water systems are able to comply with regulatory requirements and protect public health.

The Capacity Development Strategy discussion below includes ongoing work related to the original initiatives detailed in the Vermont Existing Public Water System Capacity Strategy of July 28, 2000, as well as initiatives or activities introduced since then.

Table 2 Existing Capacity Development Strategy Initiatives 2000- Current			
Capacity Initiative	Status	Target Audience	Notes
Monitoring Cost Study	Completed	TNCs	This consisted of a study completed in 2002 that identified the cost of quarterly compliance sampling for TNCs. Based on the study's findings, the state developed a budget for conducting the water quality (WQ) samples, which included providing technical support to TNCs. The work was accomplished in 2004 – 2005 through contracts with private engineering firms and use of the DEC laboratory, at no charge to the water systems.
DWSRF Program Changes	Ongoing	Potential DWSRF loan recipients	The Program has undergone occasional changes, mostly (but not exclusively) in response to new federal or state requirements, such as the recent requirement to use 20% of the federal capitalization grant for Green Project Reserve projects, and greater loan subsidy. All major changes are identified in each year's DWSRF Intended Use Plan.
Training and Assistance	Ongoing	Water System	VRWA (a technical assistance provider), under contract, conducts group and individual training and technical

		owners and operators	assistance for water system operators and owners.
Legal Assistance	Ongoing	CWS, NTNCs, loan recipients	Pays for legal services associated with DWSRF loan closings. Additionally, will assist with legal reviews for systems acquiring/merging/purchasing another system or land.
Engineering Technical Assistance	Completed	CWS, NTNC	DWGPD had several engineering firms under contract to provide operational troubleshooting assistance to small public water systems.
Small System Templates and Self-Assessment	Completed	CWS, NTNC	Templates for O&M manual and long range plan, and a capacity assessment form was developed. These documents form the basis for some of the individual on-site and group-training sessions provided. Capacity assessments are completed for all loan applicants and are a prerequisite for both planning and construction loan eligibility. Additionally, a customer complaint policy and form and <i>How to Form a Fire District</i> (currently in draft form) were developed.
User Rate Reviews and Budgeting/Assisting in the Development of Financial Capacity	Ongoing	CWS	Systems have contacted the Capacity Coordinator for assistance in establishing an equitable user rate structure. To date, six systems are in varying stages of the process.
Public Service Board (PSB) Technical Assistance	Completed	Private, for-profit CWS (regulated utilities)	Beginning in early summer of 2009, DWGPD met with representatives from the PSB and DPS to discuss better coordination between the three entities. The aim is to help the very smallest of regulated public water systems with rate review, tariffs, and reporting. This coordination is still in its early stages, but just starting the conversation is a significant milestone. Additionally, a guidance manual was developed to assist small systems in the rate approval process.
Board Member Owner Manual	Developed; printing needed	All PWSs	The manual outlines the responsibilities and liabilities for PWS board members and includes information on relevant laws, regulations, and policies, and a list of resources.
Small System Design Guidance Manual	Ongoing	PWS with < 3,300 population	Consists of the development of a design criteria guidance manual for small water systems to address system modification and replacement requirements and new regulatory requirements.
Consolidation Study	Completed	CWS	Consolidation Study was replaced with a Facilitation and Mediation contract beginning in June 2008.
Drinking Water Program's Newsletter- <i>Waterline</i>	Ongoing	All PWSs, Consultants, interested organizations	This is an effective means for communicating to a broad audience interested in hearing from the state on issues affecting public water systems. We have received feedback from readers that is highly supportive of the newsletter.
Communication Workgroup	Completed	All PWSs	A workgroup was formed to evaluate and develop recommendations on mass mailing procedures, newsletters, use of the Electronic Bulletin Board, electronic communication with water systems, and general publicity issues. A number of those recommendations were implemented.
Development of a Cross Connection Guidance Manual	Dropped	N/A	Numerous guidance documents exist that are readily available so Vermont decided it did not need to develop one of its own.
Reservoir Water Quality Study	Completed	Surface water systems	The study collected and analyzed data on changes in source water characterization during the year for two small surface water bodies used by public community water systems in Vermont. Field data collection occurred between April 2002 and May 2003 for the Town of

			Brattleboro and City of St. Albans Water Systems. Data was analyzed and results evaluated and communicated to the participating water systems.
Comprehensive Performance Evaluation Program	Completed	CWS	Three system evaluations were completed and additional CPEs may be performed in the future on a voluntary basis
Operation & Maintenance Manual Template for Small Surface Water Systems	Dropped	CWS	The need no longer exists.
Small System Engineering Evaluations	Completed	CWS, NTNC	An extremely successful initiative and may resume in the future for those systems that did not already receive an evaluation
Regulation of Consecutive Water Systems and New Water Line Extensions	Completed	CWS	Successful passage of H806 to Act 156 <i>An Act Relating to Public Water Systems</i>
Asset Management Pilot	Ongoing	CWS	In summer 2011, DWGPD approached the Village of Waterbury regarding the pilot. The Village was excited to participate; unfortunately, the Village was devastated by flooding from Tropical Storm Irene. However, the Village is still interested in moving forward and work will be restarting work in early spring 2012.
Determination of non-profit status	Completed	All	After exhaustive research, the DWGPD was given the authority to determine if a water system was not-for-profit without being a tax-exempt (through the IRS) entity. This distinction is beneficial in it reduces a potentially significant time and money delay in the DWSRF loan process
WaterSense Pilot	Ongoing	CWS, NTNC	The initial candidate was not eligible as it was clear that the water system needed to improve internal practices and repair infrastructure to address water shortage needs as opposed to there being an actual need to reduce source demand or increase production. Since then the DWGPD has worked with two other entities on water conservation as an alternative to major capital improvements. Harwood Union High School was considered a potential candidate; however, it was clear that the school had already taken significant steps to achieve water conservation/efficiency and the next step to address water demand is outside the scope of this project. The current water system to be considered for efficiency gains in order to avoid major capital expenditures is Orange Center School. DWGPD is still in the information collection stage, but this may turn out to be our first documented case where a system has saved on capital expenditures through efficiency improvements.

4. State's Approach In Providing Assistance

As indicated in the original strategy, the DWGPD continues to identify systems in need of capacity development assistance, however because technical and managerial assistance is available to meet all requests, prioritization of systems is not necessary for these forms of assistance. In the future, if the need for *technical or managerial assistance* exceeds DWGPD staff availability, DWGPD will prioritize systems using a number of factors including, but not limited to:

- ◆ DWSRF priority list status
- ◆ System ownership (municipal, private non-profit, private profit)
- ◆ System type (CWS, NTNC, TNC)
- ◆ System population- the smaller the population, the higher the priority
- ◆ Permanent residents
- ◆ System willingness

Specific forms of *technical capacity assistance* include:

- ◆ Sanitary surveys every 3-5 years
- ◆ On-site or phone consultation of system troubleshooting
- ◆ Chemistry, disinfection by-product (DBP), lead and copper, and treatment expertise
- ◆ Publish *Waterline*, and contribute articles to other publications
- ◆ Conduct operator training on new rules
- ◆ Conduct informational meetings on new rules
- ◆ Conduct source water assessments

Specific forms of *managerial capacity assistance* include:

- ◆ Review of fire district, co-op, homeowners association by-laws
- ◆ Review of water ordinances, interlocal agreements, consecutive exempt agreements
- ◆ Formation of fire districts or other management structure
- ◆ Reorganization/restructuring assistance
- ◆ Resource for voting, elections, due process
- ◆ Legal assistance
- ◆ Moral support

Specific forms of *financial capacity assistance* include:

- ◆ Low-interest loans for water system improvements
- ◆ Zero-interest loans for planning & final design
- ◆ Low-interest loans for land purchase and conservation easements for source water protection
- ◆ Negative-interest construction loans to low-income communities with high water rates relative to Median Household Income (MHI)
- ◆ Planning and final design loan forgiveness for small municipalities
- ◆ Construction loan forgiveness for municipal school system improvement projects
- ◆ Budgeting and user rate reviews

Currently, the Division is actively providing intensive ongoing capacity assistance to:

- ◆ Lyndonville Water System
- ◆ Crystal Springs Water Co./East Montpelier FD #1
- ◆ Catamount Bolton Water System/Bolton FD #1
- ◆ Chelsea Water System
- ◆ East Berkshire Water Co-op
- ◆ Four Seasons of Early Learning/Greensboro Bend FD #2
- ◆ Orange Center School
- ◆ Graniteville FD #4
- ◆ Wells River Water System
- ◆ Waterbury Village
- ◆ Richmond Water Department
- ◆ Readsboro Water Department

4.1. Accomplishments

Although many of our program's impacts are difficult to measure in quantitative terms, there are certain accomplishments that can be and are presented below. For those initiatives that are difficult to quantify, we consider the positive feedback that we have received from water system representatives indicative of program success. One specific area that can be readily quantified is the volume of loans provided to public water systems, which is a direct measure of system improvements. The following table summarizes loan awards made during the past three fiscal cycles, which includes a significant one time increase in funding attributable to the federal fiscal year 2009 economic stimulus law known as the American Recovery and Reinvestment Act (ARRA).

State Fiscal Year	Number of Loans	Aggregate Loan Amount Base SRF Program	Aggregate Loan Amount ARRA SRF
2009	52	\$10,159,630	-0-
2010	95	\$6,141,003	\$18,251,056
2011	49	\$7,328,343	\$71,075
Total for 3-Year Period	196	\$23,628,976	\$18,322,131

4.1.1. American Recovery and Reinvestment Act (ARRA)

The American Recovery and Reinvestment Act (ARRA) of 2009 added a significant increase in federal funds, enabling a greater number of systems to access low interest funding, which included substantial subsidy in the form of 57% to 67% principal forgiveness. Vermont was able to fund 44 ARRA projects, totaling over \$18M, which compares to a typical annual funding level in the \$7M to \$10M range. What follows is a partial excerpt from the ARRA Intended Use Plan which describes the projects and activities to be funded.

Criteria and Methods for Distribution of Funds

A. Loan Terms and Fees

Under the State of Vermont base DWSRF program, the standard loan term is 20 years at 3% interest, except loans to those systems that meet the Vermont statutory definition of disadvantaged. For such systems, the term may be extended up to a maximum of 30 years. Interest plus administrative fees for loans range between +3% and -3%, and are determined in accordance with previously established methods as described in the most recently adopted 2010 Intended Use Plan. Additionally, under the base program municipally-owned schools are eligible for up to \$25,000 in principal forgiveness for qualifying projects. The State provided additional subsidy beyond what is currently allowed for in the base program as described in the following section.

B. Additional Subsidization

ARRA requires that at least 50% of the capitalization grant be provided in the form of subsidy, either through forgiveness of loan principal, negative interest or grant. Vermont decided to provide this 50% subsidy through loan forgiveness as it requires the least programmatic change of the three options. Because the minimum subsidy of 50% is based on the \$19,500,000 capitalization grant amount, or \$9,750,000, and since the State used a portion of the grant for set-aside activities, the actual percentage of loan forgiveness must be greater than 50% of the grant. At the time of the federal grant award, the state requested 11% for set-asides, or \$2,145,000. The \$9,750,000 in subsidy was applied to the balance available for loans, or \$17,355,000, which equates to 56.25% in principal forgiveness. Rounding to the nearest whole percent, the minimum loan forgiveness was set at 57%.

Vermont provided this base subsidy of 57% to all loan recipients to encourage projects to proceed to construction that might not otherwise be undertaken under the economic conditions that prevailed at the time. Under ARRA, states were expected to target subsidy, as much as possible, to communities that could not otherwise afford an SRF loan. To meet this intent, additional subsidy was provided to disadvantaged communities that qualified for negative interest. To provide a consistent approach resulting in the deepest subsidy possible to a community, ARRA loan term and interest rates were computed assuming no principal forgiveness and then applied to the principal balance due after deducting the principal loan forgiveness. This method assured that the subsidy for ARRA loans under all circumstances was greater than the base SRF program subsidy, with the exception of small (~ \$25K) municipal school projects. For those small projects, the current SRF program can forgive up to \$25,000, which in some cases

results in 100% principal forgiveness. For example, a community receiving a \$1,000,000 loan and qualifying for negative 3% interest over a 30-year term (the deepest subsidy available for all but small school projects), the principal forgiveness worked out to be approximately \$750,000, or 75%.

Lastly, projects that included or were entirely comprised of Green Infrastructure received further principal forgiveness. To encourage water systems to incorporate green elements into their projects, Vermont provided an additional 10%, or a total of 67% loan forgiveness for Green Infrastructure costs. More detail on Green Infrastructure is provided in the following section.

C. Green Infrastructure

ARRA requires that, to the extent there are sufficient eligible project applications, not less than 20% of the funds provided for projects must be used for water or energy efficiency, green infrastructure, or other environmentally innovative activities. The Project Priority List (PPL) includes 20%, or \$3,900,000 of the total grant amount for projects or portions of projects meeting one or more of the specific objectives required by this provision.

Vermont made a concerted effort to identify green projects with the objective of meeting the 20% requirement by August 17, 2009 (180 days after the Feb. 17 enactment). The steps Vermont took to solicit green projects consisted of an announcement at the March 20, 2009 public meeting; an extension of the application deadline to encourage additional green projects or incorporate green components into an existing ARRA project application; a mass email following the public hearing soliciting green projects to all ARRA project applicants and their engineers; and targeted meetings with associations and other groups involved in green infrastructure. Additionally, program staff made direct phone contact with water systems that had projects on the PPL, as well as direct contacts with municipal officials known to have eligible green projects to encourage them to apply. It should be noted that when the public notice was prepared and published for this PPL, ARRA had not yet been enacted, so the green infrastructure funding portion was not well understood at that time, resulting in the need to revise the PPL.

D. Priority for Projects Ready to Proceed to Construction

Vermont has a priority system for its DWSRF program that ranks projects in accordance with criteria primarily based on public health, compliance and affordability. However, ARRA required that priority be given to projects that were *shovel-ready*, i.e. able to proceed to construction within 12 months of the date of enactment. Additionally, ARRA Section 1602 required that recipients give preference to activities that can be started expeditiously, including a goal of using at least 50 percent of the funds for activities that could be initiated within the first 120 days following enactment of ARRA. Vermont implemented this provision by elevating those projects determined as ready to proceed by July 1, 2009, and were designated as Quick Start Projects (QSP) on the PPL. A QSP was defined as a project that publishes its bid advertisement on or before July 1, 2009.

4.1.2. Technical Assistance

For many years, the Vermont Rural Water Association (VRWA) provided free technical, managerial, and operating assistance to water system owners, operators, and governing boards. This included assistance with loan applications for system improvements, on-site training, assistance with water conservation and leak detection, and unusual operation and maintenance problems. These activities were funded in part by the capacity development program. In 2009, the DWGPD determined that the number of systems needing this type of assistance could be met by program staff and therefore did not go out to bid on another technical assistance contract. VRWA is still available for assistance with a variety of water system needs; however, it is no longer done under contract with DWGPD.

An exciting new initiative to assist water systems in achieving technical capacity is the WaterSense pilot project. The goal of the project is to reduce source demand through WaterSense-labeled bathroom fixture replacement as an alternative to expensive capital projects,

i.e. source exploration or additional storage. The pilot was initially designed to assist a small mobile home park avoid expensive capital investment in a new source of water, as they were routinely running out of water. Through the information collection stages, it was discovered that internal practices and malfunctioning equipment was contributing to the system running out of water, not a lack of source water quantity. DWGPD decided not to pursue water efficiency measures because water savings could have been achieved with better communication and maintenance of equipment. Two other water systems were considered for the pilot, with the current system seeming like the most promising candidate. The current candidate is located in central Vermont and serves the Orange Center School, Orange Town Clerk's office, Orange Town Hall and one 3-bedroom residence, as one system collectively referred to as the Orange Center School. The system has routinely hauled water in September (except in 2011) at a great expense to the system. Initial investigations indicate that water use is within the design parameters, but high water use during the summer when school is not in session may indicate a leak in the distribution system or leaking fixture (most likely a toilet). Additional tests are being performed, and to date a final decision on fixture replacement has not been made.

4.1.3. Managerial Assistance

The Capacity Development Coordinator offers on-site assistance with completion of long range plans to address repair and replacement of system components, again using fill-in-the-blank type forms developed for Vermont water systems. The standard plan includes estimates of the useful life of system components such as treatment equipment, pumps, pipes, tanks, etc., the cost to replace facilities at the end of their useful life, and an estimate of the annual savings required to have adequate funds available at the time of replacement. Additionally, via the loan forgiveness process, the Coordinator completes the Capacity Evaluation Survey and Projected Capital Budget templates discussed above. These surveys are an invaluable tool for assessing systems' long term sustainability and provide an opportunity to have many water system personnel in the same room discussing system needs. It is a primer for further conversations regarding water efficiency, unaccounted for water loss, operator responsibilities and contracts, user rates and capital improvement planning.

The Coordinator works directly with many water system governing boards navigating the complex world of fire district formation and operation. As discussed above, fire districts are municipal entities formed for many reasons, including owning and operating a public water system. Because these entities are not towns, nor are they regulated utilities, they can fall through the cracks with regard to due process. The Coordinator assists volunteers from the community organize, deliberate and, ultimately often, petition Selectboards for fire district formation. The Coordinator then attends fire district meetings, reviews by-laws, advises on due process, and assists with applying for DWSRF loans, among other activities.

The Capacity Development Program also recently under took another exciting new pilot; Asset Management Program. The Asset Management Program pilot's aim is to work collaboratively with the Village of Waterbury to develop an asset management plan and assist with ongoing implementation of an asset management program. This includes identification of all water system assets, their condition, criticality, level of service, minimum life cycle cost, and long-term funding strategy. DWGPD staff will work with water system personnel to populate the EPA developed computer-based asset management tool, Check-up Program for Small Systems (CUPSS). This will be performed by DWGPD staff working directly with Waterbury's water system operator using onsite data, supplementing with field data where necessary. Concurrently, DWGPD staff will be working in GIS to create an initial system schematic, locating all assets. Ultimately, the goal is to implement the CUPSS-based asset management program for a more cost-effective and sustainable water system. Ongoing evaluation of pilot goals and objectives will be necessary to inform the future direction of DWGPD's asset management program development assistance. The water system will have ownership (long-term) of asset data and responsibility to add, delete and update assets. It is projected that this pilot will take a year to collect, enter, evaluate data, and produce the plan. DWGPD is using Set-Aside money from the 2009 EPA Drinking Water Capitalization Grant.

4.1.4. Financial Assistance

Many small municipal community water systems and rural school water systems need improvements to their distribution system, water source, storage, pumping, or treatment facilities. Such systems are eligible for myriad assistance, some are summarized below.

Beginning in 2000, the DWGPD contracted with several engineering firms to complete Small System Engineering evaluations. Most public water systems under 500 in population received one of these no-cost engineering evaluations that identified needed improvements and the estimated costs of those improvements. A total of \$775,000 was allocated for this purpose, which was funded with federal dollars made available from a Drinking Water State Revolving Fund (DWSRF) Set-Aside. The work was extremely successful in assisting small water systems determine their future needs and served as a stepping-stone to the DWSRF loan program, as many of these systems ultimately went on to receive low interest construction loans. At the conclusion of the program in 2009, 339 small water systems had been evaluated. Discussion is ongoing to begin another such program for the larger systems.

The planning and construction loan program for municipalities has been extremely successful in helping small rural schools comply with state and federal requirements. The DWSRF program offers up to \$25,000 in forgiveness for a planning loan to help a municipality through preliminary and final design for water system improvements. Additionally, the DWSRF program provides up to \$25,000 in construction loan forgiveness to public schools to achieve compliance with new State and Federal Rules. In many instances, this amounts to a 100% grant since these projects are typically smaller than \$25,000.

There is a zero percent, five-year loan program to finance preliminary and final design engineering. Up to \$25,000 of the preliminary engineering and final design loan may be forgiven if the construction project is completed and other operational requirements are met. The loan forgiveness will cover most, and in some cases all, non-construction engineering costs.

Construction loan monies are available through the DWSRF program with a range of loan terms and interest rates. The term and rate are dependent on system type and income of the users, with the standard term and rate set at 20 years and 3%. The interest rate and term may be modified if the users are required to pay more than 1.0% of their median household income annually for debt service and operation and maintenance expenses. Loan term ranges between 20 and 30 years and interest rate ranges between 3% and negative 3%. Negative 3% interest is the rough equivalent to a 40% grant.

Municipal school systems are eligible for up to \$25,000 construction loan forgiveness, subject to meeting construction operating requirements. This means that many schools can complete needed improvements to their water systems and more adequately protect the health of their students at little to no cost to school or tax-payers.

Municipal water systems are eligible for a three percent, 20-year loan to purchase land or conservation easements to improve the protection of their water source from contamination.

The Capacity Development Coordinator assists water systems with capital improvement budgeting and user rate reviews. Capital improvement budgeting is accomplished, for most systems, using an easy-to-use and understand excel spreadsheet where assets are entered along with their age, expected useful life and current installation or replacement cost. The spreadsheet will automatically calculate a projected cost to replace based on inflation and years remaining before replacement and then will calculate an approximate amount the system should be 'saving' to fully fund the asset's replacement based on an approximate savings rate and years remaining. It is recognized that this is a basic tool, but the exercise is impactful, especially for schools that are trying to convince their boards to establish a capital improvement fund but don't know a number to begin with. It is also useful for the small water system that has just invested in infrastructure, wants to adequately plan for its replacement in 20-30 years and needs to establish an appropriate user rate.

User rate reviews for community water systems are usually preceded by a Capacity Evaluation where discussions touch upon financial solvency. The Coordinator will do much follow-up work beginning with a review of existing water use, budget, user rates and practices. A presentation is made to the water system of the initial findings and recommendations are discussed. At that point, it is up to the water system what direction it wants to take, i.e. remain status quo or pursue a full review of practices, including a candid conversation about actual water loss, billing approaches and practices. This process can take up to a year or longer depending on how much work is needed.

4.1.5. Training and Information Sharing

Small water systems have a number of readily available sources of information on technical or regulatory issues including Drinking Water & Groundwater Protection Division staff, a DWGPD in-house water treatment specialist and Vermont Rural Water Association staff. In addition, there are a number of outreach programs that continually update operators on new developments and remind them of regulatory requirements.

Our newsletter, *Waterline*, is sent to approximately 3000 owners, operators and other interested parties two times a year.

Operator training courses are conducted at several locations in the state, generally at no cost to operators. An EPA operator tuition reimbursement grant has helped subsidize training. Course subjects are determined in part by an advisory committee that includes water system operators.

On-site training is available to operators on any number of topics.

Owners and operators are sent a water quality and monitoring schedule each year that lists the water samples required during the next two years and the sampling dates. These schedules are also posted on our website. Monitoring requirements vary for each system and are a function of a system's operating category and population.

Owners and operators are notified of new regulatory requirements or advisories applicable to their water systems. All notices are sent by mail, but phone, fax, or email contact may follow for those systems needing special attention.

4.2. Enforcement

When capacity development assistance is not sufficient to bring a system into compliance, enforcement is sometimes necessary. The DWGPD has well established programs of inspections, plan reviews, water quality monitoring, certified operator requirements, and operating permit requirements to continually monitor and evaluate a water system's compliance with regulations. Notifications and offers of technical assistance are the first response to a water system that has problems with meeting regulatory requirements. Formal legal enforcement actions are taken against systems that do not take advantage of the available technical, managerial and financial assistance to return to compliance. Monitoring water system compliance is supported with an automated compliance activity tracking system.

5. Improving the Capabilities of Public Water Systems in Vermont

The DWGPD's Capacity Development Program is helping to improve the operations of public water systems throughout the state, thus protecting the public health of all Vermonters. Below is a summary of a number of specific achievements made towards successful implementation of the capacity development program.

The DWGPD discourages the formation of new public water systems that lack capacity through its construction permit and operating permit programs. Effective July 1, 2008, the Vermont Legislature passed H806, *An Act Relating to Public Water Systems (Act #156)*, which enables consecutive water systems serving less than 500 persons to qualify for an exemption from federal and state drinking water

regulations. The Act encourages larger public water systems to take more operational responsibility for those portions of the system that would otherwise be regulated as a separate (but consecutive) water system, such as a water line extension to serve a new residential subdivision. This act has the rare distinction of reducing the regulatory burden on water systems without diminishing public health protection.

In 2001, the DWGPD amended the Operator Certification regulations to ensure that all water system operators are properly certified and have sufficient technical and managerial training and experience to operate their public water systems. The Division continues to sponsor and/or provide training to water system operators at no cost to most operators.

The DWGPD's Sanitary Survey Program provides for complete and detailed assessments of public water system physical plants, maintenance and operations, and administrative abilities. One of the goals of this ongoing program is to review and evaluate the capabilities of existing facilities to determine if they can assure compliance with current and future drinking water standards and regulations.

The DWGPD takes enforcement actions against public water systems that persistently fail to comply with state and federal drinking water regulations and lack capacity. Prior to taking enforcement action, the DWGPD engages in activities designed to assist the troubled system to come into compliance. These activities include engineering support, training, and establishing compliance schedules.

6. Challenges Remain for Vermont's Public Water Systems

There are many factors that impair the capacity development of public water systems. The DWGPD and its partners, including public water systems themselves, will need to be ever vigilant in maintaining the necessary technical, managerial and financial capabilities, especially at smaller systems. Sufficient technical assistance, owner and operator training, and financial assistance, particularly for economically distressed communities, must continue to be made available.

Many public water systems, particularly small systems, have difficulty understanding and complying with ever more comprehensive drinking water regulations. The Vermont Drinking Water & Groundwater Protection Division has taken the lead in developing and implementing training programs to assist small public water system owners and operators to understand current and future drinking water rules and regulations. In addition, the DWGPD continues to use the DWSRF to ease the economic impact on public water systems with rule compliance.

With the exception of a few dozen privately-owned PWSs regulated by the Public Service Board, public water systems in Vermont are not subject to mandatory user rate review to ensure a rate structure is in place to meet expenses. Even those that are regulated may not be adequately addressing the current and future financial needs of the system due to the process through which rates are adjusted. A public water system that is unable to raise the necessary revenues to support its operating expenses places a risk on its ability to provide safe drinking water. Legislation, regulations, and/or incentives that will encourage public water systems to review their water rates periodically and adjust them as necessary would help address this challenge.

A significant challenge that needs to be overcome is a lack of understanding on the part of many water system owners regarding how critical managerial capacity is in providing safe and reliable drinking water. The DWGPD may have contributed to this problem over the years by placing more emphasis on the technical aspects of a water system, and less on financial and managerial, as evidenced in the Water Supply Rule (WSR).

Quantifying success of the Capacity Program continues to be a difficult task at both the state and federal level. At the outset, an effort was made to measure Program success by drawing comparisons to regulatory compliance to the base year of 2000, when the Program was first established. It was initially thought that we could rely on statistics on federal and state regulatory compliance rates for PWSs over time as a way to measure PWS capacity progress. However, we have since grown concerned that such an approach could be misleading given the range of factors that can affect system compliance statistics, including continuing changes in regulatory requirements, and increased or modified emphasis on certain regulatory requirements.

An area of increasing concern is the shrinking number of trained operators. This concern has been raised by other states in the region as well. The challenge will be to develop recruiting strategies that will encourage more interest in this field.

7. Conclusions

This report provides an assessment of the capacity development program in Vermont and the statewide strategy for assisting public water systems in need. In addition, this report summarizes the progress made toward improving the technical, managerial, and financial capabilities of public water systems in Vermont as a result of the Division's Capacity Development Program. Overall, the Capacity Development Program, along with other state resources, has helped public water systems in Vermont acquire and/or maintain the technical, managerial, and financial abilities needed to properly operate, manage and finance their systems. The Division will continue to strive to achieve the fundamental goals of the capacity development program, and looks forward to increasing the awareness of stakeholders of public water systems as well as the general public about new challenges and issues related to water system capacity as they arise.

There is a great deal of flexibility in program administration and implementation as it relates to providing capacity assistance. This has been instrumental in making the capacity program work for those systems that need it most. The DWGPD does not conduct regularly scheduled reviews of the implementation of its Capacity Development Program; however, there is significant interest in re-visiting the efficacy of the initial Capacity Initiatives and how they relate to program goals. The objective of re-visiting would be to re-establish, re-write and/or develop new initiatives given the program is past the 10-year mark and significant experience was gained during that time. In reviewing the existing strategy, it is apparent that much of the initial initiatives were heavily focused on technical capacity. The focus of the program is shifting increasingly to managerial and financial capacity. We believe that this Program continues to provide effective public health protection, particularly for the many small, rural water systems in Vermont in a way that places emphasis on a collaborative rather than heavy-handed bureaucratic approach. We are fortunate that thus far federal resources have been available for the majority of this effort.

Availability of the Report to the Public

The DWGPD posts this and other Capacity Development Program reports on its web site at: <http://www.vermontdrinkingwater.org>.