



Department of Environmental Conservation
Drinking Water and Groundwater Protection Division

Vermont's Drinking Water Capacity Development Program Annual Report 2018



Helping public drinking water systems improve their technical, managerial, and financial capabilities so they can provide safe, affordable drinking water to their customers.

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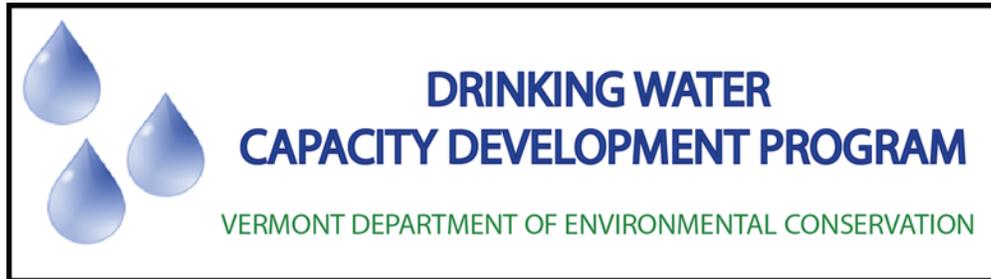


Table of Contents

Introduction	4
Capacity Development for New Public Water Systems	5
Vermont’s Regulatory Program Application.....	5
Capacity Determinations.....	6
New System Compliance.....	7
Capacity Development for Existing Public Water Systems	8
Identifying Systems that Need Assistance.....	9
Helping to Improve Technical, Financial and Managerial Capacity.....	10
Capacity Development – Looking Forward	15
Appendix A. Operator Certification Program Annual Report for 2017	



Introduction

Vermont's public drinking water systems face significant challenges as they try to comply with regulations, manage aging infrastructure, and achieve financial viability. To help address these challenges and to meet the requirements of the federal Safe Drinking Water Act's (SDWA) 1996 Amendments, the Drinking Water and Groundwater Protection Division (DWGWP, or Division) created a Capacity Development Program. The Program's objectives are:

- To ensure that new public community (CWSs) and non-transient non-community (NTNCs) drinking water systems demonstrate the technical, managerial, and financial capacity to provide a sufficient quantity of safe water in a cost-effective manner now and into the future;
- To help existing systems become more sustainable by improving their technical, managerial, and financial capabilities; and
- To ensure long term compliance with Vermont's Safe Drinking Water Standards as specified under Chapter 21 of the Environmental Protection Regulations, Water Supply Rule.

Technical capacity refers to a system's physical and operational abilities.

Managerial capacity refers to a system's administrative and organizational abilities.

Financial capacity refers to a system's abilities to generate or obtain enough money to maintain the system and pay for future improvements.

This annual report is required by the Environmental Protection Agency (EPA). It provides a summary of the Capacity Program's efforts during state fiscal year 2018 (July 1st, 2017 thru June 30th, 2018). The first section briefly describes the state's legal authority to ensure that all new CWSs and NTNCs demonstrate the capacity to comply with drinking water regulations. It also lists the compliance status of the systems that began providing water within the past three years.

The next section of the report focuses on the Capacity Program's strategy to help existing systems improve their technical, managerial, and financial capabilities. It describes how the Program identifies systems that need assistance and some of the tools used to help build capacity. *The last part of the report describes the Program's plans for the near future.*

Figure 1. There are three types of public drinking water systems (PWSs):

Community water systems serve 25 or more year-round residents or have 15 or more year-round residential connections;

Non-transient non-community water systems serve 25 or more of the same people at least six months per year. Examples include daycares, schools, and office buildings; and

Transient non-community water systems serve 25 or more people per day at least 60 days per year. The persons served need not be the same people. Examples include delis, hotels, campgrounds, and restaurants.

The EPA will use this report to help determine whether Vermont’s Capacity Development Program meets the SDWA’s statutory requirements. Failure to meet the requirements would result in a 20% withholding from our Drinking Water State Revolving Fund (DWSRF) Capitalization Grant. For example, the grant for federal fiscal year 2018 is \$11,107,000, so failure to comply would result in a \$2,221,400 penalty.

Capacity Development for New Public Water Systems

Section 1420(a) of the SDWA requires the state to ensure that all new CWSs and NTNCs beginning operations after October 1st, 1999, demonstrate the capacity to comply with regulations. Vermont’s legal authorities to implement this requirement are in statute (10 V.S.A. § 1685) and rule (Environmental Protection Rules, Chapter 21 Water Supply Rule). There were no changes to these legal authorities during the year.

Vermont’s Regulatory Program Application

The Water Supply Rule (Environmental Protection Rules, Chapter 21) prohibits a new CWS or NTNC from operating before demonstrating that it has adequate technical, managerial, and financial capacity. The rule also outlines the criteria to demonstrate capacity and includes several control points – places where the DWGWPD can exercise its authority to ensure a new system will have adequate capacity (see Figure 2). Each control point marks a significant milestone in demonstrating capacity. The DWGWPD makes a formal determination as to whether a system has adequate capacity at two points – before issuing the construction and operating permits for new NTNC or CWS systems. This year the Capacity Program introduced a step in the Capacity Review Process to ensure that an owner does not become financially committed to becoming a public water system before the DWGWPD is convinced that, upon receiving all permits, the Water System can maintain over the long term adequate technical, managerial, and financial capacity. This new step requires the PWS owner and consulting engineer to meet with the Capacity program and submit requested documentation prior to receiving *any* drinking water permits from DWGWPD.

Figure 2. Control points to ensure that new CWSs and NTNCs have adequate capacity.

-  *Source Protection Plan Approval*
-  *Source Permit Issuance*
-  *Long Range Plan Approval*
-  *Construction Permit Issuance*
-  *O&M Manual Approval*
-  *Sampling Plan Approvals*
-  *Operator Certification*
-  *Operating Permit Issuance*



Capacity Determinations for New Public Water Systems

The table below lists new systems for which a capacity determination was completed during state fiscal year 2018. It also lists proposed systems for which an evaluation is underway, but not yet completed, and a note regarding their Capacity Review Status.

Table 1. Capacity evaluation status for new CWSs and NTNCs.

WSID	Water System Name	PWS Type	Date Activated	Capacity Review Status
VT0021585	Kids of the Kingdom on the Hill	NTNC	9/29/2017	Capacity determination completed
VT0021615	Georgia Daycare	NTNC	Proposed	Source permit application received, capacity review process started
VT0021615	Garden Time	NTNC	Proposed	Source permit application received, capacity review process started, project on hold by Water System
VT0020376	Killington Village Water System	CWS	Proposed	Source and Construction permit issued, capacity review process started, project on hold by Water System
VT0021005	Sundance Subdivision	CWS	Proposed	Source and Construction permit issued, capacity review process started, project on hold by Water System
VT0021396	Daniels Construction	NTNC	Proposed	Source and Construction permit issued, capacity review process ongoing
VT0021588	17 Black Walnut LLC	CWS	Proposed	Source permit application received, capacity review process started, project on hold by Water System
VT0021590	Quechee Lakes Subdivision – Highland Parcel	CWS	Proposed	Source permit application received, capacity review process started, project on hold by Water System

New System Compliance

If a public water system does not comply with a federal and state drinking water regulation, the DWGWPD notifies the water system's owner(s) and operator(s) of the alleged violation. The Division's notification of violation letter requests that the system inform the public of the alleged violation, provide corrective action as necessary, and return the water system to compliance with safe drinking water standards. The DWGWPD also offers the system technical assistance to help them return to compliance (on-site inspections, written determinations, meeting discussion, engineering assistance and permitting). If the system still does not make significant effort and progress to comply with established safe drinking water standards, the DWGWPD takes necessary and appropriate enforcement action.

The DWGWPD uses the Drinking Water Enforcement Tracking Tool (ETT) to help prioritize enforcement actions. The EPA requests that the state include in this annual report the ETT status of CWSs and NTNCs activated during the past three years (see Table 2, below). Systems that exceed a score of ten become an immediate enforcement priority. Those with scores of ten or less are tracked closely. No systems activated in the past three years has a score of more than ten.

Table 2. Compliance status of CWSs and NTNCs activated within the last 3 years that had capacity determinations.

WSID	Water System Name	PWS Type	Date Activated	On ETT list? Score?
VT0021585	Kids of the Kingdom on the Hill	NTNC	9/29/2017	Yes- 2
VT0021446	The Binding Site VT	NTNC	3/16/2017	No
VT0021272	South Face Village at Okemo	CWS	11/3/2016	No
VT0021454	Heartbeet Community Center	NTNC	10/11/2016	No
VT0021062	MSCVT Water System	NTNC	9/08/2016	No
VT0021448	Westminster Public Safety Building	NTNC	8/02/2016	Yes-5
VT0021202	Berlin Municipal Water System	CWS	2/22/2016	No

Capacity Development for Existing Public Water Systems

Section 1420(c) of the SDWA requires the state to develop and implement a strategy to help existing public water systems acquire and maintain technical, managerial, and financial capacity. On July 28th, 2000 the DWGWPD published its “Existing Public Water System Capacity Strategy”. The strategy’s five major components are listed in Figure 3. With time, the Capacity Development Program has incorporated other tools. For example, in the last four years, the Program has begun to employ a strategic long-term planning strategy which promotes water systems inventorying and performing condition assessments of their assets and preparing budgets and timelines for infrastructure maintenance and replacement. We believe this strategy will further strengthen and improve systems’ technical, managerial, and financial capacity in the short-term and into the future. The DWGWPD began to revise the formal Capacity Development Strategy in 2018 to incorporate this additional focus.

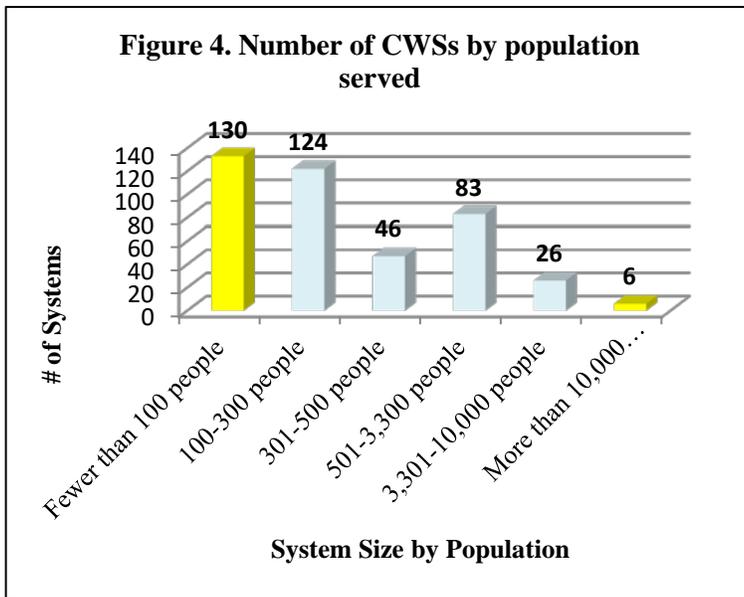
During Fiscal Year 2018, there were 1,393 active public water systems in Vermont, including:

- ◆ 415 community systems (CWSs),
- ◆ 248 non-transient non-community systems (NTNCs), and
- ◆ 730 transient non-community systems (TNCs).

Vermont is unique in that 72% of its CWSs are very small (i.e., serve 500 or fewer people). According to the EPA, only about 56% of CWSs nationwide are this small (EPA Document 816-R-10-022, July 2011). Figure 4 shows a breakdown of the CWSs in Vermont by population served. As this figure depicts, the number of very small water systems far outweighs the number of large systems. Most small systems in Vermont were created when regulatory standards were less stringent than they are today. For example, most of Vermont’s small CWSs were created between 1975 and 1987. The smallest systems are often run by part-time or volunteer staff with limited time and limited budgets. Many do not generate enough revenues to cover the system’s full cost of service because they have a very small customer base and inadequate water rates. Too often water service rates have been kept low by relying on volunteers or underpaid staff, and deferring infrastructure maintenance, repairs, and replacement.

Figure 3. The *Existing Public Water System Capacity Strategy* describes:

- ◆ The methods or criteria used to identify and prioritize systems in need of capacity development assistance.
- ◆ The factors (e.g., legal, regulatory, or institutional) at the federal, state, or local level that encourage or impair capacity development.
- ◆ The ways the state uses its authorities and resources to help systems comply with regulations, encourage the development of partnerships between systems, and train and certify water system operators.
- ◆ The methods used to establish a baseline and measure improvements in capacity.
- ◆ The ways to involve interested parties in developing and implementing the capacity development strategy.



Lacking strong capacity, specifically managerial and financial capacity, these systems need the tools and training to help them operate in a more sustainable manner. Water systems need assistance to identify their infrastructure needs and the resources available to assist them in completing necessary and required improvements. While the Capacity Development Program provides its assistance to all CWSs and NTNCs, extra focus is on the smallest, and frequently the most non-compliant, community systems.

Identifying Systems that Need Assistance

The Capacity Development Program uses compliance data and sanitary survey findings to help identify systems in greatest need of technical assistance. DWGWPD staff conducts a sanitary survey at each system every three years. In state fiscal year 2018, staff surveyed 161 CWSs and 41 NTNCs.

During each survey, division staff reviews the system’s compliance with regulatory standards and provides the water system with guidance on how to improve operations and management. If the system is identified as needing technical, managerial, and/or financial capacity assistance, the surveyor refers them to the Capacity Development Program.

Information from capacity determinations for systems applying for DWSRF loans is also used to direct technical assistance to the Program. The DWSRF Program Lead completes most of the capacity determinations for loan applicants. Capacity Development Program staff also complete the eligibility determinations related to loans that involve a change in ownership of the water system. During the capacity assessment, staff ensures that the improvements project that is being proposed for DWSRF loan funding is designed to address technical deficiencies that have been identified by the Division. For systems lacking managerial and/or financial capacity, staff prepares a list of tasks that, if completed, will improve the water system’s capacity. These tasks are either provided as recommendations to the system, included as a compliance improvements schedule activity within an operating permit, or as a requirement for loan approval or forgiveness. The DWSRF Program Lead and/or the Capacity Development Program staff work with systems that request help completing the tasks. The state does not award DWSRF monies to systems that lack adequate capacity unless the funds will improve the system’s capabilities and address chronic non-compliance issues.

Helping Improve Technical, Financial and Managerial Capacity

During the year, the state continued to use tools identified in the capacity development strategy to help systems improve their technical, managerial, and financial capabilities. These tools include: source, construction, and operating permits; sanitary surveys; financial assistance programs, including low interest and negative interest loans; technical assistance consultations; and source water assessments. The Division continues to develop new capacity development initiatives, while continuing to emphasize Asset Management and Water Loss Control Programs. Some highlights are described below.

Asset Management Programs (AMP) - Workshops, Grants, and Loans

In a 2014 capacity questionnaire, Vermont's community water systems identified "creating or updating an Asset Management Program...or other tool to help manage the water system" as a top priority. In order to help community water systems develop an Asset Management Program, the Capacity Program has hosted multiple Asset Management training workshop series each year since 2015, and followed up by offering grants in 2016 and 2017 for Asset Management Plans to select community water systems. In 2018, the Capacity Program transitioned from a grant program for asset management plans to a forgivable loan program for these plans.

During the workshops, participants learned how to develop the components of an Asset Management Program to help solve a problem with their drinking water utility. Between each of the workshops, the participants applied what they learned by working on portions of an Asset Management Program (i.e. Level of Service Goals, Asset Management Inventory and Condition Assessment, Maps, Life Cycle Cost Analysis, Risk Assessment, Risk and Cost Reduction Strategies, Funding Strategies) for their system. By the end of the workshop series each water system had developed a program for part of their system and gained the knowledge and confidence to grow their water system's Asset Management Program over time. Representatives from 12 community water systems participated in the 2018 workshop series.

An Asset Management Program uses level of service goals, a detailed asset registry, risk assessments, risk and cost reduction strategies, and financial planning to help set priorities and meet customers' expectations in a cost-effective manner. It can help systems:

- ◆ *Operate more efficiently,*
- ◆ *Prolong the life of assets,*
- ◆ *Make informed decisions,*
- ◆ *Justify needs and decisions,*
- ◆ *Plan and pay for future repairs and replacements, and*
- ◆ *Become more resilient and sustainable.*

An up-to-date map and asset inventory are the backbone of a successful Asset Management Program. Public water systems often have limited staff time available and creating a detailed inventory can take several years. Water systems can benefit from the development of an Asset Management Program before the asset inventory is complete; however, the time and effort needed to create an inventory often prevents a water system from starting an Asset Management Program. Therefore, in 2016 and 2017, the Division's Capacity

Development Program offered systems grants of up to \$20,000 to assist with the development and implementation of an Asset Management Program. These grants were used by the community water systems to develop portions or complete Asset Management Plans, depending on the size of the water system.

In 2017, 21 systems were awarded an Asset Management grant; 6 of the 21 grantees received grants in 2016 for other components of an Asset Management Program. Systems use the funding to develop level of service goals and performance measures; create an asset inventory and assess the condition of assets; map assets; analyze asset life cycle costs; conduct a risk assessment to identify priority assets; develop risk and life cycle cost reduction measures; and create funding strategies (see Table 3).

As stated above, in CY2018, the Division’s Capacity Development Program transitioned from grants to 100% forgivable planning loans for Asset Management Plans. To receive 100% forgiveness for these DWSRF Planning Loans, the Water System Operator and a Board Member must attend training in asset management and a complete approved Asset Management Plan must be developed. The Capacity Development Program is limiting the number of forgivable Asset Management Planning Loans issued to five a year to allow Division staff the time to help the recipients and ensure the Asset Management Plans developed are robust and meet the needs of the individual water system.

Table 3. Number of systems with grant funding to complete each component of an Asset Management Program.

Asset Management Program Components	2016 Number of Systems with Grant Funding for Component	2017 Number of Systems with Grant Funding for Component	2018 Number of Systems with Loan Funding for Component
Level of Service Agreement (Goals and Performance Measures)	19	16	5
Asset Inventory and Condition Assessment	27	21	5
Maps	19	18	5
Life Cycle Cost Analyses	12	17	5
Risk Assessments	23	16	5
Risk and Cost Reduction Strategies	21	17	5
Funding Strategies	19	16	5

Free Stand-by Power Evaluations



In CY2018, the Division, in conjunction with DWSRF Program, offered standby power evaluations to CWSs, as well as NTNCs that have been designated emergency shelters. This initiative was split into two phases. For the first phase, the DWGWPD assigned contractor provided free sizing, design, and benefit-cost analysis for auxiliary power supplies to operate water system infrastructure during interruptions to the main electrical supply. Ten water systems received free stand-by power evaluations.

As follow-up to the evaluations, the DWGWPD intends to combine selected standby power evaluations into a single application for a grant offered by the Federal Emergency Management Agency's (FEMA's) Hazard Mitigation Grant Program to assist the selected public drinking water systems with the purchase and install of standby power. Regardless of whether a Water System is selected for the second phase or not, having the evaluation will put the Water System in a better position to meet the standby power requirements of the Water Supply Rule.

Drinking Water Lead Reduction Strategies Grants

In early 2017, the Capacity Development Program offered grants to help public CWSs reduce the risks of exposure to lead in drinking water. The purpose of the grants is to help community systems create an inventory of publicly and privately-owned lead service lines and/or other lead-containing infrastructure; develop strategies for removing the lead infrastructure and reducing exposure users; and communicate with system users. The total amount available for the grants was \$125,000; maximum grant award \$80,000, and the minimum grant award \$20,000.

Two community water systems were awarded grants, totaling \$125,000. Grant funding will be used to: find, map, and inventory water distribution and customer service lines and other lead-containing infrastructure; establish a proactive, full lead service line replacement program; educate the public about the risks of exposure to lead in drinking water and how to reduce risks; develop a Capital Needs Study, Capital Improvement Plan, and funding strategies to replace publicly and privately-owned lead lines and other lead-containing infrastructure.

The work under the grant is expected to be completed by December 15, 2018. We expect these grantees to develop and implement risk reduction strategies that other communities can use as a model, with an emphasis on finding and removing lead service lines.



Leak Detection Surveys

Finding and repairing leaks in a timely fashion can minimize wasteful water withdrawals, reduce treatment costs, capture lost revenue, prevent disruptions to the water system, and protect public health. For the fourth consecutive year, the Capacity Development Program has offered free leak detection services to CWSs.

To be considered for the leak detection services, systems had to submit a project request including the results from a basic water audit, the miles of pipe they want to be surveyed, the pipe’s age and material type, and any additional information demonstrating why the system would benefit from the project (e.g., water pipe break history, or examples of system water shortages or low-pressure events thought to be caused by leaks). The system also had to agree to assist with the survey (i.e., preparing maps, locating listening points, exercising valves, etc.), and fix any leaks found.

In fiscal year 2017, 17 public community drinking water systems received leak detection services. About 55 miles of pipe were surveyed and 19 leaks were identified. An estimated 77 gallons per minute (110,880 gallons per day) of drinking water was being lost through these leaks. Capacity Development Program staff followed up with the systems to ensure that they fixed the leaks or had a plan to do so. Because leak detection is not an exact science, some leaks were likely not found. Table 4, (see below), provides a summary of the leak detection surveys conducted in fiscal years 2014 - 2017.

Table 4. Summary of leak detection surveys completed in fiscal years 2014 - 2017.

Fiscal Year	Number of Systems	Miles of Pipe Surveyed	Number of Leaks Identified	Estimated Losses from Leaks Identified (gallons per day)
2014	25	155	51	519,840
2015	24	359	89	1,731,960
2016	32	257	117	936,720
2017	17	55	19	110,880

In 2018, 14 systems were awarded a leak detection survey. The surveys are being conducted in accordance with the American Water Works Association’s “Water Audits and Loss Control Programs” manual (Manual of Water Supply Practices M36, 3rd Edition, 2009). They are scheduled to be completed by the end of October 2018. A final project report will be prepared once the surveys are done.

The Capacity Development Program plans to offer leak detection services again next year, calendar year 2019. Also, we plan to help systems develop more comprehensive water loss programs by offering trainings and technical assistance on conducting and validating water audits. Comprehensive water loss programs will likely be required for some systems in the future.



Revised Total Coliform Rule – Level 2 Assessments

To meet the goals of the Revised Total Coliform Rule, the Drinking Water and Groundwater Protection Division’s Compliance and Support Section offers free Level 2 Site Assessments to CWSs and NTNCs following the triggers identified in the Rule, including an *E. coli* maximum contaminant level violation, or certain repeated total coliform or compliance issues. The goal of the assessments is to help identify sanitary defects or issues that triggered the assessment or led to the compliance issues, and recommend corrective actions to resolve the issue. This will lead to a better understanding of the water system by the operator, increased compliance with drinking water regulations, and greater protection of public health. Sixteen Level 2 Site Assessments were completed at CWSs and NTNCs during the last state fiscal year, 11 by assessors, 5 by Division staff.

The table below summarizes some other on-going capacity development initiatives.

Table 5. On-going capacity development initiatives for existing systems.

Initiative	Target Audience	Description
Drinking Water State Revolving Fund (DWSRF) Program Changes	Potential DWSRF loan recipients	Changes were made to the Priority List ranking criteria in December 2016. These changes attempt to streamline the deficiency point categories, preserving award of the highest points to the most serious public health risks, elevating projects that will address lead and copper issues, and refining how aged infrastructure is addressed. For the aged infrastructure issue, three new categories were created to better reflect what the funding and regulating programs are witnessing: inadequacy of critical components, system vulnerability to contamination, and improvements to/redundancy of system components.
Training and Assistance	Public water system (PWS) owners and operators	Contract with Vermont Rural Water Association to provide technical assistance and conduct group and one-on-one trainings. Appendix B includes a summary of the training provided during the year. Since 2015, the Capacity Development Program has also hosted intensive Asset Management workshop series.
User Rate Reviews and Budgeting/Assisting in the Development of Financial Capacity	CWSs, NTNCs	Systems have contacted the Capacity Development Program for assistance in establishing an equitable user rate structure. The Capacity Development Program has hosted some Rate Setting workshops.
By-laws & Ordinance Development and Updates	CWSs	Several water systems requested help with creating or updating by-laws and ordinances. Developing a checklist of items to include in a municipal ordinance.

Ownership restructuring	CWSs, NTNCs	Providing guidance while undergoing restructuring (e.g., forming a Fire District to acquire a privately-owned system, assisting with a merger between two municipal entities)
Technical Assistance, RTCR Assessments, and Contamination Investigations for transient non-community (TNCs) water systems.	TNCs, NTNCs, CWS	The DWGWPD has contractors available to provide technical assistance, conduct contamination investigations and RTCR assessments at TNCs. Assistance includes determining the possible causes of contamination, identifying sanitary defects, making recommendations on how to improve the system and comply with regulations. This service has helped educate owners and operators at TNCs on drinking water regulations, protect public health and assist systems with staying in compliance or returning to compliance more quickly.

Capacity Development – Looking Forward

The Capacity Development Program’s goal is to help ensure that Vermont’s public water systems are sustainable. Sustainable drinking water systems have the technical, managerial, and financial capabilities to provide their customers a sufficient quantity of clean, safe water in a cost-effective manner - now and into the future.

“You cannot have a first-rate community...with third-rate infrastructure”– Source unknown

Feeling pressure to keep user rates low, many communities have not been making the investments needed to properly maintain, repair, rehabilitate, and replace their drinking water infrastructure. Consequently, more pipes, pumps, storage tanks, and water treatment plants continue to exceed their engineer’s assessment for remaining useful life. The EPA estimates that Vermont needs to invest more than \$510 million in public drinking water infrastructure in the next twenty years to ensure the health, security, and economic well-being of our communities (Drinking Water Infrastructure Needs Surveys and Assessment, Fifth Report to Congress, April 2013). This estimated infrastructure expense does not include sufficient revenue for on-going operations and maintenance, expenses incurred to comply with new regulations, or expenses associated with expanding water systems.

As drinking water infrastructure continues to age and degrade, public water systems will continue to struggle to be sustainable and remain in compliance with safe drinking water standards and regulations. Funding from utility reserves and public financing will likely not be enough to address Vermont’s drinking water infrastructure needs into the future. This financial shortfall presents the greatest challenge for most public community water systems. Vermont’s Capacity Development Program is encouraging systems to develop and implement Asset Management Programs to help address this funding shortfall, and to plan to meet these and other challenges they likely face (e.g., emerging contaminants, retaining the knowledge of retiring staff, adjusting to changes in demand for services, and complying with new and more stringent regulations).

Building on momentum from the Asset Management Plan Development Workshops and Grants, the Capacity Development Program will continue to help systems by offering more training, technical assistance, and 100% forgivable Asset Management Planning Loans. In addition, the Capacity Development Program will update the Division Capacity Strategy to ensure it continues to drive the direction of the program and helps Vermont's Water Systems increase their technical, managerial, and financial capacities.

Vermont's systems need to 'dig deep' and invest more in drinking water infrastructure and materially commit to using standardized financial and managerial systems practices and approaches to operate, maintain, repair, rehabilitate, and replace outdated and no longer useful assets. State and federal governments need to invest more to assist very small to medium sized Public water systems too. In 2018, the federal capitalization grant and state match that fund Vermont's Drinking Water State Revolving Loan Program increased by 33% to \$11,107,000. But this is not enough, the funding needs for PWS infrastructure replacement, operations and maintenance continue to grow. Without proper funding, we will not be able to continue to rely on our drinking water infrastructure for disease protection, fire protection, basic sanitation, economic development, and to support our quality of life.