NewsLeaks
Vermont Rural Water Association
Fall 2023

INUNDATED

Water and wastewater systems experience major flooding p.3

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The Vermont Rural Water Association provides training and support to drinking water and wastewater systems to promote healthy communities, rivers, and lakes across Vermont.

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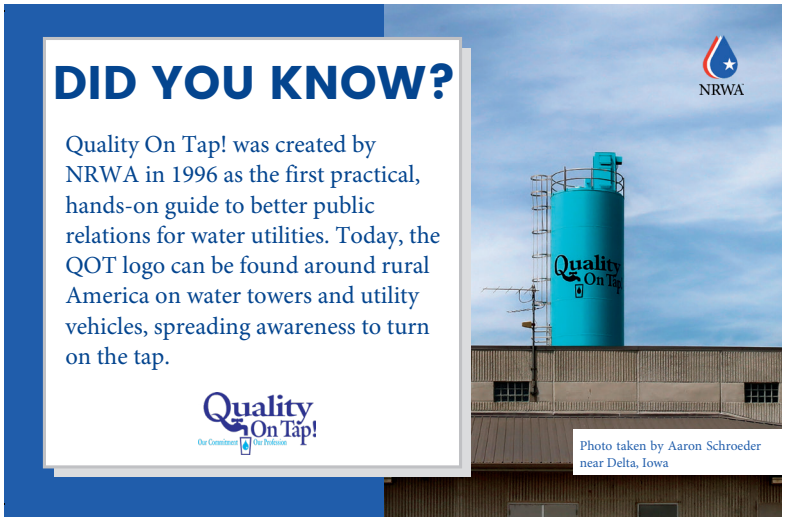
On the cover: The Vermont Rural Water/VT WARN emergency response trailer at Hardwick's wastewater treatment facility after July's flooding.



Devastating Floods at Water & Wastewater Systems

by Katherine Boyk
Program Assistant

Ludlow's wastewater treatment facility was severely damaged by flooding.

Like many in Vermont, I woke up on Monday, July 10 with a feeling of panic. The night before, it had been pouring rain and we'd had flash flood warnings for hours. Now, before I even changed out of my pajamas, I had heard from two of my coworkers at Vermont Rural Water who couldn't leave their house because their streets were flooded.

By the time I made it to the office—located in Essex Junction, which was spared any major damage—we were starting to hear about water and wastewater systems that were in distress. Towns east of the Green Mountains were seeing major flooding. The crew at the Ludlow wastewater treatment facility had to be evacuated by boat.

My coworkers jumped into emergency response mode. Wastewater specialist Wayne Graham went to check on systems in the northern part of the state and deputy executive director Tim Russo drove to southern Vermont. Elijah Lemieux, our other wastewater specialist whose road was flooded, called systems on the phone. We discussed whether to cancel a Zoom class the next day. I put together an email update with information, resources, and safety reminders. I didn't know it at the time, but this was to be a daily task for me for the next week and a half. Executive director Liz Royer, meanwhile, had been on the phone nonstop with operators, state staff, and reporters. This would become a daily task for her as well—and it still is as I write this four weeks later.

Soon the flooding spread to the western side of the Green Mountains and major rivers like the Winooski and the Lamoille overflowed their banks. By the next morning, we had heard that the wastewater treatment plants in Hardwick and Johnson were underwater. So was the source well for Morrisville's drinking water. A water main in Marshfield was damaged and officials warned that the community may be without drinking water for days. Operators in Waterbury, Montpelier, and Richmond were scrambling to prevent catastrophe as the Winooski River rose.

And it was still raining. We were still under flash flood warnings. There was even a tornado watch at one point. Folks were already comparing this to Tropical Storm Irene, which hit Vermont in 2011 but was still fresh in everyone's mind. Some were saying this was worse than Irene, as the damage was more widespread and the rain just kept coming.

The Drinking Water and Groundwater Protection Division started issuing Boil Water Notices for

water systems impacted by flooding. Nine communities were initially put on Boil Water. By the end of the week, I would count sixteen systems on Boil Water, two on Do Not Drink, and one with no water at all.

Wayne Graham at the Johnson wastewater treatment facility.

My coworkers continued to check in with water and wastewater systems across the state and help out at the ones that were hardest hit. I'm not sure if Wayne, Elijah, and Brad Roy, our Source Water Specialist, were getting any sleep. Elijah had spent so much time at the Ludlow wastewater treatment plant that he was able to start a tour for the assessment team while operator Joe Gaudiana met with the insurance adjustor.

Operators from other systems stepped up as well. Ethan Graham, Wayne's son and an operator at the St. Johnsbury wastewater treatment facility, delivered an emergency response trailer to Hardwick's wastewater plant. He also helped clean and rebuild the chemical feed room, which had been ravaged by the flood.

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Water & Wastewater Added to FEMA's Community Lifelines

On August 1st, the Federal Emergency Management Agency (FEMA) quietly added Water Systems to its list of Community Lifelines. These are critical functions that are essential to human health and safety or economic security. Community Lifelines receive extra focus from FEMA during an emergency.

The Water Systems lifeline focuses on these components:

Potable Water	Wastewater Management
• Intake	• Collection
• Treatment	• Storage
• Storage	• Treatment
• Distribution	• Discharge

The other Community Lifelines are Safety and Security (such as police and fire); Food, Hydration, and Shelter (includes agriculture and bottled water); Health and Medicine; Energy; Communications; Transportation; and Hazardous Materials.

The addition of Water Systems to this list of Community Lifelines means that during a disaster, FEMA will include metrics like the number of households without potable water and the number of wastewater leaks/breaks in its daily Situation Reports. Water and wastewater systems will also be part of FEMA's pre-disaster response planning.

What does this mean for Vermont? The Water Systems lifeline was incorporated into reporting during the July flooding disaster. This served to increase state and federal attention to damage sustained by water and wastewater systems.

According to an article by Water ISAC, "FEMA and EPA worked closely together to better identify and represent the water sector (drinking water and wastewater systems) in existing emergency response procedures, protocols, and frameworks." Water sector organizations have been advocating for this designation for years through Congressional testimony, after action reports, and other methods.

– Liz Royer

Advocate for Emergency Response Planning

On a local level, water and wastewater systems should advocate to be included in emergency-related communications, Regional Emergency Management Committees, and hazard mitigation efforts. Even municipal systems shouldn't assume that they will automatically be included in town and regional emergency planning efforts. You will need to continually educate your local officials and legislators about your critical services, especially when there is turnover in these positions.

If you are a Fire District, a homeowners' association, or other non-town owned entity, you will need to work even harder to educate your local and regional officials about your purpose and your needs during and after a natural disaster or other emergency.

On a statewide level, Vermont Rural Water and VT WARN will continue to educate Vermont Emergency Management and other organizations on the essential and critical nature of the water sector. We will continue pushing to include more information on water and wastewater systems and infrastructure in the State Emergency Management Plan and Hazard Mitigation Plan.

Our industry is the first line of defense in the protection of public health and the environment every day, and even more so during flooding and other disasters. While many of us prefer our work to remain behind-the-scenes, we need to capitalize on the attention that water and wastewater have received since the July flooding. Now is our chance to draw more support (and ultimately, more funding!) to replace and improve our damaged and aging infrastructure.

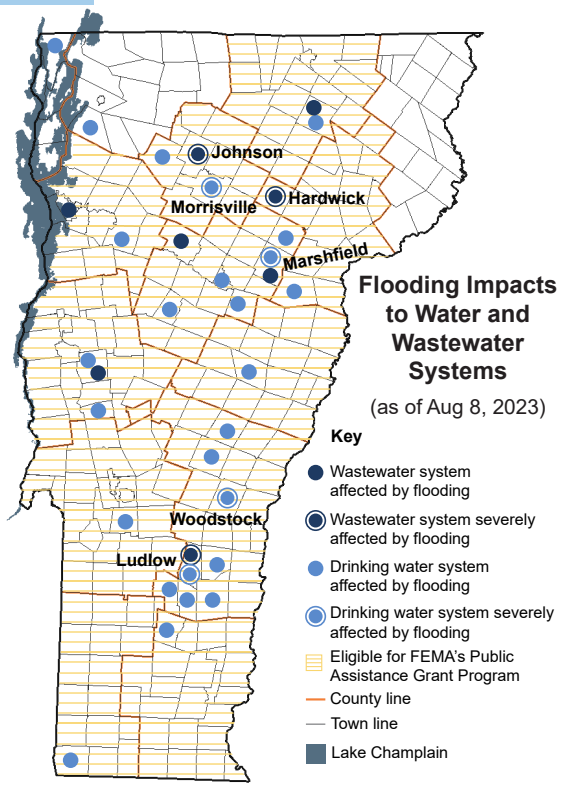
– Liz Royer

Liz Royer at the Johnson wastewater treatment facility.

Resources for Water/Wastewater Systems

Updates from Vermont Rural Water:
https://vtruralwater.org/flooding-july-2023/

Information about FEMA assistance:
https://vtruralwater.org/fema-pa/



Silent Water Hero in the Night: Disaster Response during the Christmas Ice Storm

by Aaron Perez
Water System Specialist

Ray Counter (left) and Aaron Perez inspect a generator at Brandon Fire District #1.

It was a dark and stormy night just before Christmas. Ray Counter, the water superintendent of Brandon Fire District #1, was called out at 1:30 am on December 23 by a no power alarm at the district's 1.4 million gallon water storage tank. At that time, the backup battery power at the tank was adequate to maintain its minimal needs, mostly to run the supervisory control and data accusation (SCADA) system. Before going back home, Ray checked the three wells to ensure that they still had power and weren't damaged by the storm.

Later, at 3:30 am, Ray received a no power alarm at all three wells. He got back out of bed and headed out. Upon arrival at wells 2 and 3, which are the main operating wells, he confirmed that the power was out. He tried to call the electric company using the phone number on their website, but only got a recording that they were not able to answer phones due to high call volume.

At that time the storage tanks had sufficient water available to maintain system pressure and provide fire flow. Regardless, with no estimate of when the power would be restored, Ray stayed to monitor the situation.

At 10:30 am, Ray decided to start the generator at well 2. It started fine and was running well until two hours later, when Ray received yet another power fail alarm. Upon investigation, he found an issue with the pump motor control, which made this well inoperable.

Ray's perseverance would not be hindered; he went to well 3 and started its generator. This generator started, ran for an hour and half, and then failed as well! At this point Ray called the generator service company and, despite the fact that they were extremely busy dealing with the numerus power outages across the state, a technician who was in the area was able to promptly respond.

The technician found an issue with an oil pressure sensor. They didn't have a replacement part, but since the well 2 generator was not being used, they took that sensor, which was luckily the same make and model. The generator at well 3 was repaired and running, water was being produced, and the storage tank level was recovering.

Ray had been at work dealing with this situation for fourteen and a half hours at this point and went home for some much-needed rest. He did not get it! As all dedicated operators know, it is impossible to truly rest with a situation like this at the back of your mind. So he went in every couple of hours to make sure that everything was still running correctly.

Sometime between 11:00 pm on December 23rd and 4:00 am on the 24th, the generator for well 3 failed again. Another storm had

moved in, bringing snow and freezing temperatures. Back into the cold and dark Ray went. He arrived at the well house only to find that the lock for the gate had frozen shut, so he had to get bolt cutters from the shop. After finally gaining entrance, he tried in vain to start the generator.

At this point he returned to the office to consult Brandon Fire District's emergency response plan. Ray tried to call the electric company again and received the same recording. At 5:15 am, Ray called Vermont Emergency Management to ask about the restoration of power and request a backup generator. He was told that they would make some inquires and get back to him. Ray notified the fire department chief of the situation and the potential for a water shortage.

At 9:30 am, Dana Nagy, the Drinking Water Community Operations Section Supervisor, who had been contacted by Vermont Emergency Management, called Ray for an update on the situation. Dana said that he would also contact the power company to try to get an estimate of when electricity would be restored.

After speaking with Dana, Ray returned to well 3 to again try to start the generator. This time it started on the second attempt. The day had warmed up a little, which may have contributed to the generator's successful start. Ray's heart rate and blood pressure returned to somewhat back to normal at this point.

An hour later, Ray finally received information from the electric company. There was significant damage to the power line feeding the two main production wells. They estimated that power would be restored that evening, Christmas Eve.

Ray continuously monitored the generator at well 3 to make sure it kept running. It did until power to the wells was restored at 6:00 pm. Ray ran the well in manual because the electricity at the tank was still down so the SCADA system wasn't working. He had to monitor the pressure at the valve vault building with a flashlight to ascertain tank level.

At 7:30 pm Ray had just returned home when he received a follow-up call from Vermont Emergency Management. He was able to inform them that power had been restored but the well was running in manual operations.

At 9:00 pm, power was restored to the storage tank. Ray was able to switch the pumps from manual to auto and the fire district returned to normal operation. At 3:30 am, Christmas morning, the storage tanks refilled to their proper operating levels and Ray could finally rest.

LESSONS LEARNED

Following this this event, Brandon Fire District did an after action assessment and came up with these conclusions:

Communications: Vermont Emergency Management should have been notified at the start of the event. The Vermont Water and Wastewater Response Network (VT WARN) could also have been contacted to request a back-up generator or spare parts.

Generators: Investigate the possibility of purchasing a portable generator that could serve as back-up power to the tank and any of the wells. A generator or other back-up power source is needed at storage tanks to ensure the automatic operations of the SCADA system. If SCADA systems are connected to a back-up power source, you will receive an alert if an issue arises.

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Training Calendar

Fall 2023

Date	Course	TCHs	Location	Cost (Member/Non)
Tue, Oct 10 9 am – 12:30 pm	Busting Gender Bias	3 **W WW**	Essex	No cost
Oct 12, 13, 17, 20 8 am – 12:30 pm	Small Systems Water Treatment Course: Class 2	16 **W**	Hybrid (Zoom/Essex)	No cost $60 textbook
Tue, Oct 24 9 – 11:30 am	Recruiting and Retention for Gender Equity	2 **W WW**	Essex	No cost
Tue, Oct 31 9 am – 2 pm	Class 3 & 4 Exam Preparation Course	4 **W**	Hybrid (Zoom/Essex)	$28 / $56
Wed, Nov 1 9 am – 2 pm	Distribution Exam Preparation Course	4 **W**	Hybrid (Zoom/Essex)	$28 / $56
Fri, Nov 3 9 am – 12:30 pm	Permit Required Confined Space Entry **New Class!**	3 **W WW**	Essex	$21 / $42
Mon, Nov 6 9 am – 12:30 pm	Introduction to Wastewater Treatment **New Class!**	3 **WW**	Essex	$21 / $42
Tue, Nov 7 9 am – 12:30 pm	Water and Wastewater Ethics	3 **W WW**	Zoom	$21 / $42
Tue, Nov 14 9 am – 12:30 pm	Water Treatment: Microbiology **New Class!**	3 **W**	Essex	$21 / $42
Thur, Nov 16 9 am – 12:30 pm	Trench and Excavation Safety **New Class!**	3 **W WW**	Essex	$21 / $42
Tue, Nov 28 9 am – 12:30 pm	Water Treatment: Chlorination **New Class!**	3 **W**	Essex	$21 / $42
Tue, Dec 5 9 am – 12:30 pm	Corrosion Control and Polymers	3 **W WW**	Zoom	$21 / $42
Thur, Dec 7 9 am – 12:30 pm	Creating and Updating Your Operation and Maintenance Manual	3 **W**	Zoom	$21 / $42
Tue, Dec 12 9 am – 12:30 pm	Troubleshooting Sequencing Batch Reactors (SBRs)	3 **WW**	Zoom	$21 / $42
Wed, Dec 13 9 am – 1:30 pm	Basic Math for Water and Wastewater Operators	4 **W WW**	Zoom	$28 / $56

TCH = Training Contact Hours **W** = Approved for Water Credit **WW** = Approved for Wastewater Credit

Locations

Essex: Vermont Rural Water's office – 20 Susie Wilson Rd, Suite B, Essex Junction, VT 05452

Hybrid: These classes are offered simultaneously in-person and over Zoom.

Zoom: You will receive the Zoom link by email the day before class.

Registration and Payments

Register online at vtruralwater.org/training to pay by credit card or check, or mail in the form below. Registrations received less than 24 hours prior to class are subject to a late fee.

Members of the Vermont Rural Water Association receive a 50% discount on most registration costs.

Wastewater Renewal Extension

Pollution abatement facility operators have been given an extra six months to renew their licenses due to the flooding emergency. Wastewater operators now have until **January 31, 2024** to complete required continuing education credits and pay the licensing fee.

Cancellations/Refunds

Cancellations received at least 24 hours in advance can receive a refund or transfer to another class. No-shows will be charged the full course fee.

Sick Policy

As we offer more in-person classes, we ask that if you have symptoms of a contagious illness (Covid, flu, or other) you please do not attend classes in-person. If you are ill on the day of class, we will work with you to find a remote attendance option or switch to another class on a different day. We want water and wastewater systems to be able to stay fully staffed and this should help all of us stay as healthy as possible.

Accommodations

We strive to make our trainings accessible to all. Call 802-660-4988 or email info@vtruralwater.org prior to the day of class to request accommodations.

Register Online: vtruralwater.org/training

Registration Form

Duplicate this form to register for multiple classes.

Course and Date: _____

Attendee Name(s): _____

System/Organization: _____

Billing Address: _____

_____

Email: _____

Phone: _____
(number where you can be reached the morning of class)

Payment Enclosed: _____

Mail this form and payment to:
VRWA
20 Susie Wilson Rd, Suite B
Essex Junction, VT 05452

Questions?
info@vtruralwater.org
(802) 660-4988

Reducing Inflow and Infiltration to your WWTF Part 1: Sump Pumps

by Wayne Graham
Wastewater Specialist

Left: a typical sump pump in a basement. Right: an illegally connected sump pump, hooked to a building's sewer line that flows to the municipal wastewater collection system.

In this series of articles, I will discuss cost effective ways of reducing inflow and infiltration to wastewater facilities. This is a timely discussion given our wet summer and the recent devastating flooding.

Let's start with some definitions, which come from *Operation of Wastewater Treatment Plants, Volume 1*. Inflow is "water discharged into a sewer system and service connections from sources other than regular connections. This includes flow from yards, drains, foundations, and around access and manhole covers."

Infiltration is "the seepage of groundwater into a sewer system, including service connections. Seepage frequently occurs through defective or cracked pipes, pipe joints and connections, interceptors access risers and covers, or manhole walls."

The book further clarifies, "Inflow differs from infiltration as it is a direct discharge into the sewer rather than a leak in the sewer itself."

Sump pumps can be a big source of inflow to collection systems and wastewater facilities. Sump pumps are used by some residents to remove water from their basements.

Unfortunately, a lot of sump pumps are hooked into a home's sewer line, which flows to municipal collection systems. This results in increased flow that the wastewater collection system has to handle and the wastewater facility has to treat.

A typical home sump pump (40 gallons/minute) running 10 minutes per hour can pump 9,600 gallons per day. If there are just 20 such sump pumps in your community, that is 192,000 gallons of unwanted water being sent to your wastewater facility every day!

All this extra inflow from sump pumps takes up valuable facility capacity and restricts the amount of future hookups a system can handle, and therefore, restricts growth of the community. It may even lead the facility to undergo expensive upgrades to accommodate more capacity.

Sump pump discharges also cause wastewater facilities to use more electricity and treatment chemicals and can affect the efficiency of the treatment process. Sewer backups and overflows can also occur if inflow and infiltration increase during a rainstorm.

A much better solution for sump pump discharges is to connect them to a storm water system, drainage ditch, or dry well.

Here are some ideas for reducing sump pump flows into sewer collection systems:

EDUCATION: many residents do not realize the problems they are causing by hooking sump pumps

into their sewer lines. Educational mailings, billing inserts, door hangers, newspaper notices, and town report messages are all ways of communicating to residents about proper use of sump pumps. Many residents who learn that they pay for these wasteful flows through sewer rates and taxes will voluntarily fix the problem.

ORDINANCES: many communities have sewer ordinances that regulate illegal connections such as sump pumps, roof drains and perimeter drains. Enforcing the sewer ordinance is sometimes necessary.

PLUMBERS: a visit to your local plumber(s) to remind them about proper sump pump installation may also help.

Consider these options when trying to reduce costs, increase capacity, and improve efficiency. Getting the word out about the proper use of sump pumps and doing periodic inspections of basements may yield surprising results.

For assistance with inflow and infiltration in your collection system and wastewater treatment facility, contact Vermont Rural Water's wastewater specialist Wayne Graham at 802-660-4988 x319

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Spare parts for generators should also be included in a water or wastewater system's inventory. Generator companies may no longer have all necessary spare parts in stock due to supply chain issues. Ask your generator company what parts are most likely to wear out and purchase extras of these.

Establish a relationship with a generator rental company prior to an emergency. Talk with a sales representative in your area and inform them of the critical services your system provides. Include this person's contact information in your Emergency Response Plan.

Electric provider: Water and wastewater departments should establish communications protocols with their electricity provider. Electric companies may have an email list or designated phone number for critical customers like water and wastewater utilities. This way you will have a direct way to get information during a power outage, rather than calling the general customer service line. Periodically review this procedure with the electric company and check that your information is up-to-date.

Ray Counter checks a control panel.

Emergency Response Plan: After a situation like the power outage at Brandon Fire District or the severe flooding this summer, revise your emergency response plan with information you learned or wish you had during the emergency. This way the plan will serve you better next time.

Aaron Perez (right) and operator Bradley Danforth prepare for a January cold snap by identifying vulnerable areas in Brandon Fire District's distribution system.

Assistance Available for Service Line Inventories

GUEST AUTHOR
by Danielle Jepson
Vermont Drinking Water and Groundwater Protection Division

Lead is a highly toxic metal—there is no safe level of lead in the body. Children, pregnant people, and sensitive groups are especially at risk. Too much lead in the body can damage the brain, kidneys, and nervous system. Lead is not usually found in the water sources (e.g., wells, springs, surface water) used by Vermont's public drinking water systems. However, lead was historically used in some drinking water infrastructure, including service lines, and premise plumbing. Through corrosion and physical disturbance, lead from these sources can enter drinking water and reach consumers' taps as small particles or dissolved in the water.

The Drinking Water and Groundwater Protection Division (DWGPD) is offering a free program to help small water systems develop their Service Line Inventories (SLI) and Lead Service Line Replacement (LSLR) Plans in accordance with the federal Lead and Copper Rule Revisions (LCRR). Through this program, Community (CWS) and Non-Transient Non-Community (NTNC) water systems serving 1,000 or fewer customers are eligible for free contracted assistance.

DWGPD will assign contracted consultants to work directly with interested water systems to create SLIs and LSLR plans by the LCRR's due date of October 16, 2024. DWGPD's Sustainable Infrastructure Analysts are managing these contractors and providing technical support for this program.

To enroll in this program, water systems must complete the assistance request form. Once a contractor is assigned to a water system, the contractor will reach out to the water system's primary contact and schedule a kickoff meeting.

DWGPD staff performing a service line inspection at an NTNC school. Photo provided by DWGPD.

The contractor will coordinate with the water system to schedule site visits for visual inspections, research and review records, develop and complete the SLI, and if necessary, create a LSLR plan. Water systems must collaborate with the contractor to make this assistance program successful.

The DWGPD Sustainable Infrastructure Section sent eligible water systems an email in June 2023 containing the contracted assistance request form and FAQs. If your water system has not received this email or has any questions about this program, please contact ANR.SLI@vermont.gov

The purpose of the Service Line Inventory is to document what materials service lines are made of, both water system-owned and customer-owned. If any service lines are made of lead or an unknown material, an Lead Service Line Replacement Plan must be created as well.

Lead was banned in water system components on July 1, 1989. Even water systems built after this ban must submit an inventory verifying that all service lines are non-lead. The LCRR does not waive any CWS or NTNC water system from completing an inventory.

Assistance is also available for water systems that don't qualify for the contracted assistance program. CWSs serving more than 1,000 customers can receive a loan through the Drinking Water State Revolving Fund (DWSRF) to hire a consultant or cover in-house staff time. For NTNC schools, DWGPD staff are developing inventories, and LSLR plans when necessary, at no cost to the school.

Visit the Service Line Inventory page at https://dec.vermont.gov/water for additional information about inventories and available assistance, including a FAQ on contracted assistance.

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Tim Dagesse from Barton loaned chemical feed pumps and equipment to Hardwick as well.

Morrisville's chlorine feed pumps were destroyed in the flooding and the water system was on Do Not Drink orders. Charlie Taylor in Lyndonville responded within 15 minutes saying that they had pumps and parts available to loan.

Margaret Dwyer from Winhall-Stratton Fire District #1 loaned a pumper truck to Ludlow. Chris Hughes from Cavendish delivered a trash pump. Springfield loaned a vactor truck, and Springfield staff came multiple times to help with jetting and vac work.

Similarly, an operator from Burlington brought a trailer-mounted pump to Johnson and stayed to help with the cleanup effort.

The Rutland wastewater treatment facility provided activated sludge to help reseed Ludlow's treatment process, as the microorganisms had been diluted by floodwaters. South Burlington did the same for Montpelier.

That first week was very busy and very stressful for operators at flood-damaged systems and for us at Vermont Rural Water. I would like to say that things have calmed down a bit, but we still have a long way to go. We are transitioning our focus from immediate response to long-term recovery. We are thinking about not just rebuilding, but building smarter.

At the same time, the rain continues. As I write, Middlebury is now experiencing flooding that has impacted both the drinking water and wastewater systems.

And we are all thinking: climate change. These floods are the effect of climate change, right here in Vermont. Which means that this will keep happening. It means that we need to rebuild smarter. We need to be prepared for the next disaster, because it will happen. Soon.

Dan Copp, chief operator at the Johnson wastewater treatment plant, shows the height that floodwaters reached.

Paul Sestito setting up a bypass pump in Waterbury.

An assessment team tours the Ludlow wastewater treatment facility.

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