



**Annual Report for National Pollutant Discharge Elimination System (NPDES)
General Permit 3-9007 for Stormwater Runoff from the State Transportation Separate Storm
Sewer System (TS4; 2017)**

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APPENDICES

**Appendix A: CHITTENDEN COUNTY REGIONAL STORMWATER EDUCATION PROGRAM
(RSEP)**

**Appendix B: CHITTENDEN COUNTY REGIONAL STORMWATER PUBLIC INVOLVEMENT AND
PARTICIPATION PROGRAM (“STREAM TEAM”)**

1.0 REGULATORY OVERVIEW

In November 2017, the Vermont Agency of Natural Resources (VT ANR) Department of Environmental Conservation (DEC) issued the National Pollutant Discharge Elimination System (NPDES) General Permit 3-9007 (GP 3-9007) for Stormwater Discharges from the State Transportation Separate Storm Sewer System (TS4; the Permit) for stormwater discharges from the Vermont Agency of Transportation (VTrans; the Agency) owned or controlled impervious surfaces. Per Part 1 of the Permit, the purpose of the Permit is to provide efficiencies in overall program management by combining post-construction operational stormwater requirements for VTrans that are associated with its designated regulated small municipal separate storm sewer systems (MS4s); industrial activities, commonly regulated under the Multi-Sector General Permit 3-9003 (MSGP 3-9003); and previously permitted, new, redeveloped, and/or expanded impervious surfaces, commonly regulated under State Operational Stormwater Permits (e.g., General Permit 3-9015, General Permit 3-9010, and Individual Stormwater Discharge Permit [INDS]). The Permit is issued pursuant to the Vermont Water Pollution Control statute, 10 V.S.A. Chapter 47, specifically §§ 1258 and 1264; the Vermont Water Pollution Control Permit Regulations (Environmental Protection Rules, Chapter 13), including the rule governing general permits in Section 13.12; the Vermont Stormwater Management Rule (Environmental Protection Rules, Chapter 18); the Vermont Stormwater Management Rule for Stormwater-Impaired Waters (Environmental Protection Rules, Chapter 22); the federal Clean Water Act (CWA), as amended, 33 U.S.C. § 1251 *et seq.*; and related regulations of the United States Environmental Protection Agency (U.S. EPA) at 40 C.F.R. 122.

1.1 BACKGROUND

In December 2017, VTrans filed a Notice of Intent (NOI) for General Permit 3-9007 to the VT ANR DEC. The NOI included a Stormwater Management Program (SWMP 2017), which includes a comprehensive plan to manage the quality of stormwater discharged from the TS4 in accordance with Part 5 of the Permit. Attachments with the SWMP include:

- Attachment A: List of Waters (Table 1 and Table 2)
- Attachment B: Chittenden County MS4 Stormwater Program Agreement (July 1, 2018)
- Attachment C: VTrans Bridge Washing Best Management Practices and VT ANR Vehicle Washing Policy
- Attachment D: VTrans Flow Restoration Plan
- Attachment E: VTrans Phosphorus Control Plan (to be provided by April 2020)
- Attachment F: Incorporation of Previously Permitted Stormwater Systems
- Attachment G: Stormwater Program Evaluation Top 13 Actions
- Attachment H: Gap Procedure

2.0 COVERAGE UNDER THIS PERMIT

As outlined in Part 2 of the Permit, the Permit applies to:

- VTrans-owned or controlled state highways, sidewalks, multi-use pedestrian paths, welcome centers, airports, gravel pits, mineral mining, maintenance facilities, park & rides, truck weigh stations, and VTrans-owned facilities leased to third parties, including welcome centers and airport facilities (hangars and terminals), and excludes rail lines, rail yards, public transit facilities, and rail trails.
- State highways and VTrans-owned or controlled non-road impervious surfaces in the urbanized areas and stormwater-impaired watersheds of Burlington, Colchester, Essex, Essex Junction, Milton, Shelburne, South Burlington, Williston, Winooski, the University of Vermont, the Burlington International Airport, Jericho, Underhill, St. Albans, the Town of St. Albans, the Town of Rutland, and the City of Rutland.
- VTrans-owned or controlled airport facilities and non-metallic mineral mining facilities.

3.0 ANNUAL REPORTING REQUIREMENTS

In accordance with Subpart 10.2 Annual Report of GP 3-9007, VTrans shall submit annual reports to the DEC Watershed Management Division, Stormwater Management Program by April 1st each year. Flow Restoration Plan (FRP) and Phosphorus Control Plan (PCP) reports may be included with the annual report when reporting deadlines coincide. In addition to FRP and PCP reporting requirements, the annual report shall include reporting requirements under Parts 4, 5, 6, and 7 of the Permit, as well as:

- A. The status of VTrans' compliance with permit conditions, an assessment of the appropriateness of the identified Best Management Practices (BMPs), progress towards achieving implementation of BMPs necessary to meet Total Maximum Daily Load (TMDL) requirements and progress towards achieving the statutory goal for the six minimum measures of reducing the discharge of pollutants to the Maximum Extent Practicable (MEP), and the measurable goals for each of the minimum control measures and TMDL implementation measures;
- B. An inspection report on the condition of VTrans' stormwater management systems that notes all problem areas and all measures taken to correct any problems and to prevent future problems;
- C. Results of information collected and analyzed, if any, during the reporting period, including monitoring data used to assess the success of the program at meeting TMDL requirements and the success of the six minimum measures;

- D. A summary of the stormwater activities VTrans plans to undertake during the next reporting cycle (including an implementation schedule);
- E. Proposed changes to VTrans' SWMP, including changes to any BMPs or any identified measurable goals that apply to the program elements; and
- F. Notice that VTrans is relying on another government entity to satisfy some of its permit obligations (if applicable).

In the following sections of this annual report, as well as the accompanying Annual Report Workbook, VTrans is providing a summary of activities as they are associated with the annual reporting requirements listed above. In addition to the information provided in this annual report, the accompanying Annual Report Workbook includes the following tabs with relevant updates:

- Tab 4.0: Discharge Requirements Annual Reporting
- Tab 6.0: Minimum Control Measure (MCM) Annual Reporting
- Tab 6.1: Trainings Summary
- Tab 6.3.a: Facilities Updates
- Tab 7.0: Industrial Activities Summary
- Tab 8.0: Operational Stormwater Management System Annual Inspections Summary
- Tab 9.1: Flow Restoration Plan (FRP) Implementation Summary
- Tab 9.2: Phosphorus Control Plan (PCP) Development Reporting

4.0 DISCHARGE REQUIREMENTS

Impaired waters are those waters that VT ANR has identified pursuant to Section 303(d) of the Clean Water Act (CWA) as not meeting the Vermont Water Quality Standards (VWQS). Impaired waters encompass both those with approved TMDLs or Water Quality Restoration Plans (WQRPs), and those for which TMDL development is necessary but has not yet been approved by the U.S. EPA. Per the Permit, except for Part 9, a VTrans project is considered to discharge to an impaired water if the first water of the State to which runoff discharges is identified as an impaired water. For discharges that enter a separate storm sewer system prior to discharge, the first water of the State to which runoff is discharged is the waterbody that receives the stormwater discharge from the storm sewer system. To address this requirement, VTrans has developed and provided a complete list of first waters to which designated MS4/TS4 areas discharge; included as Table 1 in Attachment A of the SWMP (2018).

4.1 DISCHARGES TO IMPAIRED WATERS WITH AN APPROVED TOTAL MAXIMUM DAILY LOAD WITH WASTELOAD ALLOCATION

Discharges from the TS4 to impaired waters with an approved TMDL and wasteload allocation, including descriptions of the measures being used to address requirements where applicable, are listed in Tables 1 and 2 in Attachment A of the SWMP (2018). Progress on measures VTrans is implementing can be found in Tab 4.0 of the Annual Report Workbook.

4.2 DISCHARGES TO IMPAIRED WATERS WITH AN APPROVED TOTAL MAXIMUM DAILY LOAD WITHOUT WASTELOAD ALLOCATION

Discharges from the TS4 to impaired waters with approved TMDLs, where the TMDL does not specify a WLA or other requirements for the TS4 discharge, are listed in Tables 1 and 2 in Attachment A of the SWMP (2018). These tables include a summary of VT ANR-approved measures that VTrans is implementing to address the pollutant(s) of concern addressed by the TMDL. Progress on measures VTrans is implementing can be found in Tab 4.0 of the Annual Report Workbook.

4.3 DISCHARGES TO IMPAIRED WATERS WITHOUT AN APPROVED TOTAL MAXIMUM DAILY LOAD

Identified and mapped discharges from the TS4 to impaired waters that are listed on the "State of Vermont 303(d) List of Impaired Waters, Part A – Impaired Surface Waters in Need of TMDL" are listed in Tables 1 and 2 in Attachment A of the SWMP (2018). These tables include a summary of measures that VTrans is implementing to ensure compliance with the VWQS. Progress on measures VTrans is implementing can be found in Tab 4.0 of the Annual Report Workbook.

5.0 STORMWATER MANAGEMENT PROGRAM

Per Subpart 5.1 of the Permit, VTrans has developed a written SWMP (2018) to include information required, as necessary, under Part 3 of the Permit; the information required under Part 4 of the Permit to address discharges to impaired waters; the required elements under the six minimum control measures in Part 6 of the Permit; the industrial control measures in Part 7 of the Permit, including the Stormwater Pollution Prevention Plan (SWPPP); the operational stormwater requirements under Part 8 of the Permit; and the Flow Restoration Plan (FRP) and Phosphorus Control Plan (PCP) developed in accordance with Part 9 of the Permit.

To meet requirements of Subpart 5.2 of the Permit, VTrans has performed an annual review of the SWMP and has no changes for this reporting period.

6.0 MINIMUM CONTROL MEASURES

Per Part 6 of the Permit, VTrans has developed and is implementing and enforcing a SWMP (2018), which includes the six minimum control measures that are designed to reduce the discharge of pollutants from the TS4 to the MEP, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. For purposes of the six minimum control measures, implementation of BMPs consistent with the provisions of the SWMP constitute compliance with the standard of reducing pollutants to the MEP. The six minimum control measures include:

1. Public Education and Outreach on Stormwater Impacts (MCM 6.A)
2. Public Involvement and Participation (MCM 6.B)
3. Illicit Discharge Detection and Elimination (MCM 6.C)
4. Construction Site Stormwater Runoff Control (MCM 6.D)
5. Post-Construction Stormwater Management for New Development and Redevelopment (MCM 6.E)
6. Pollution Prevention and Good Housekeeping for VTrans' Operations (MCM 6.F)

The BMPs that are being implemented by VTrans to address these six minimum control measures are included in Part 6.0 of the SWMP (2018). A summary of annual reporting requirements and progress for each MCM is provided in Tabs 6.0, 6.1, and 6.3.a of the Annual Report Workbook.

7.0 INDUSTRIAL ACTIVITY CONTROL MEASURES

Per Part 7 of the Permit, VTrans has developed and is implementing Stormwater Pollution Prevention Plans (SWPPPs) for its airport transportation facilities and facilities that conduct non-metallic mineral mining and dressing as the primary activity on site and that have the SIC Codes listed in the Permit. VTrans has selected, designed, installed, and implemented control measures, including BMPs, to minimize pollutant discharges that address the selection and design considerations, meet the nonnumeric effluent limits, meet limits contained in applicable effluent limitations, and meet the water quality-based effluent limitations per the relevant subparts of Part 7 of the Permit. A table that lists airport transportation facilities and non-metallic mineral mining and dressing facilities that are included in the VTrans TS4 and that were previously issued an MSGP 3-9003 by VT ANR is provided in Part 7.0 of the SWMP (2018). A link to the SWPPPs that have been prepared for these facilities can be found at:

<https://outside.vermont.gov/agency/VTRANS/external/docs/stormwater/Forms/AllItems.aspx>

A summary of trainings, inspections, monitoring, and any corrective actions taken is provided on Tab 7.0 of the Annual Report Workbook.

8.0 STORMWATER DISCHARGES FROM IMPERVIOUS SURFACES

Per Part 8 of the Permit, permit coverage is provided for: (1) previously permitted stormwater runoff discharges and proposed new stormwater runoff discharges from impervious surfaces that trigger jurisdiction as outlined in Subpart 8.1.A of the Permit, (2) stormwater discharges to waters of the State that are not impaired by stormwater and to waters of the State that are listed as principally impaired due to stormwater runoff with a stormwater WQRP or TMDL on the EPA-approved State of Vermont List of Priority Surface Waters (Part D, Impaired Surface Waters with Completed and Approved TMDLs) and that have an approved FRP or other approved implementation plan.

A list of projects in the TS4 with VTANR operational coverage including status, inspections, and corrective actions needed or taken is provided on Tab 8.0 of the Annual Report Workbook.

9.0 TOTAL MAXIMUM DAILY LOAD IMPLEMENTATION

9.1 FLOW RESTORATION PLAN

VTrans maintains infrastructure within the watersheds of the following stormwater-impaired waters: Allen, Bartlett, Centennial, Indian, Moon, Munroe, Potash, Rugg, Stevens, and Sunderland Brooks. Per Subpart 9.1 of the Permit, VTrans submitted an FRP to VT ANR in October 2016 (FRP 2016) to address requirements of General Permit 3-9014 for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (2012) associated with these watersheds; see Attachment D of the SWMP (2018). Upon approval by VT ANR, the FRP will become a part of the SWMP (2018).

Supporting information per annual reporting requirements of the TS4 are provided in Tab 9.1 of the Annual Report Workbook.

Per Subpart 9.1 of the Permit, VTrans, along with other MS4s, funds a Flow Monitoring Program to address flow and precipitation monitoring in its respective stormwater-impaired watersheds. Stream flow and precipitation monitoring data that are collected through this program are available at the following links:

- Flow monitoring data: <http://vt-ms4-flow.stone-env.com/FlowDev/index.html>
- Precipitation data: <http://vt-ms4-flow.stone-env.com/Precip/index.html>

VTrans spent \$17,005.00 this year on the Flow Monitoring Program.

9.2 PHOSPHORUS CONTROL PLAN

VTrans maintains infrastructure in all 13 lake segments within the Lake Champlain Basin. Per Subpart 9.2 of the Permit, VTrans will develop and implement a comprehensive PCP for the TS4 within the Lake Champlain Basin in phases, beginning with the establishment of baseline phosphorus loading and calculation of the phosphorus load reductions needed to achieve its percent reduction from the TS4 for each Lake segment. Development and implementation of the remaining phases of the PCP, and submittal to VT ANR, will be conducted per the schedule outlined in Subpart 9.2.C of the Permit.

A summary of progress towards meeting the milestones established for phosphorus control planning is provided in Tab 9.2 of the Annual Report Workbook.

10.0 RECORD KEEPING AND REPORTING

Per subpart 10.1 of the Permit, VTrans is retaining records of monitoring information, copies of reports required by the Permit, copies of Discharge Monitoring Reports (DRMs), a copy of its authorization and amended authorizations under this Permit, and records of data used to complete the NOI for this Permit, for a period of at least three years from the date of the sample, measurement, report or application, or for the term of this Permit, whichever is longer. VTrans is retaining copies of written records relating to the stormwater collection, treatment, and control systems, and BMPs, including calculations used to size STPs, authorized under this Permit. VTrans is submitting its records to VT ANR when specifically asked to do so. VTrans is retaining a copy of the SWMP and a copy of the Permit language at a location accessible to VT ANR. VTrans is making its records, including the NOI and SWMP, available to the public, if requested to do so in writing.

Per subpart 10.2 of the Permit, VTrans is submitting its annual reports to the VT DEC, Watershed Management Division, Stormwater Management Program by April 1st each year. FRP and PCP reports may be included with the annual report when reporting deadlines coincide.

APPENDICES

**Appendix A CHITTENDEN COUNTY REGIONAL STORMWATER
EDUCATION PROGRAM (RSEP)**

Minimum Control Measure #1:
Public Education & Outreach
REGIONAL STORMWATER EDUCATION PROGRAM
RETHINK RUNOFF

JANUARY–DECEMBER 2021
ANNUAL REPORT

Prepared by:

Pluck

Introduction

Since 2003, Chittenden County's twelve MS4s have worked to pool resources to professionally engage the public in a one message, one outreach effort known as the Regional Stormwater Education Program. Through regular spring and summer advertisements to drive people to the program's website, www.smartwaterways.org, this cooperative approach to fulfilling its NPDES Permit Minimum Control Measure #1 (Public Education & Outreach) requirements has built a regional awareness among the public of the need for individual action to assist in fighting stormwater problems.

In the summer of 2016, the MS4s contracted with Tally Ho through their Lead Agency, the Chittenden County Regional Planning Commission, to rebrand the Smart Waterways campaign into a combined effort with the MS4's Minimum Measure #2 regional effort known as the Chittenden County Stream Team. The goal was to create one cohesive organization and outreach effort to both educate the public about stormwater and boost public participation in implementation of projects to combat the negative impacts of stormwater. In spring of 2017, Rethink Runoff was publicly launched, including a new website and revised creative by Pluck (previously Tally Ho Design).

Pluck has been responsible for the creative, administration, and management of Rethink Runoff since late 2017.

This 2021 calendar year report recaps the work done primarily related to Minimum Control Measure #1. As in prior years, this work was developed through coordination with CCRPC and its MS4 subcommittee of the Clean Water Advisory Committee.

2021 Initiatives

In 2021, Pluck maintained existing creative for advertising, while introducing certain web initiatives and introducing social media in the 2021-2022 fiscal year, all for the purpose of continuing to drive residents to visit the program website, www.rethinkrunoff.org. We continued our Ms. Drop's Tip of the Month promoted animation as a way of providing monthly and seasonal topics related to stormwater runoff (*A on page 3.*)

We introduced HTML5 animations onto our What You Can Do interior pages on the website (*F on page 4*). These short, repeatable animations are based on our existing visual language and provide on-screen movement to web visitors.

We set up tracking onto the websites for conversions (or actions our visitors take while visiting the website). Our first conversion to be tracked was a downloadable pdf with instructions on How to Build a Rain Barrel. Rain Barrel workshops often book to capacity and are also restricted to residents by the host city or town, so including a downloadable pdf on the site allows us to measure of interest in visitors doing DIY stormwater-related projects.

During 2020-2021, we discussed our approach to rain gardens with the subcommittee. Rain gardens are inherently expensive to install, when compared with other initiatives, like installing rain barrels. With that in mind, we created a new downloadable pdf (*B on page 3*) identifying plants used in rain gardens that homeowners could use in their gardens, to help alleviate stormwater runoff. The overall strategy was to identify and include a low-cost options for homeowners, allowing them to take action to reduce stormwater runoff, thereby raising awareness.

In Fall 2021, we introduced Google Search ads to complement our Google Display ads and YouTube ads (*E on page 4*). Whereas Google Display ads are graphic-based ads served on websites based on content (i.e. fertilizer-related ads on a site about lawn care), Google Search are text-based ads shown in response to users' searches. In this way, we're able to provide a presence and a direct call to action. For example, we created a series of Search ads offering non-fertilizer-based lawn care ads designed to be seen when users searched for "fall lawn care tips" or related topics.

Starting in the fall of 2021, we also began to strengthen social media development as well as implementation of social media content. Our social media strategy focuses on Facebook and Instagram, our existing social media channels. Our work here complements the outreach efforts of MCM #2 effort, the Rethink Runoff Stream Team, administered by the Winooski Natural Resources Conservation District. Our overall strategy includes posting brand-related content, Lake Champlain news, general water pollution/clean water news (*C on page 3*), and Instagram-based engagement from Vermont residents (i.e. reposting Lake Champlain and Vermont waterways photography). In some cases, social media posts are promoted via ads, based on target MS4 audiences (*D on page 3*).

2021 Creative

A. SOCIAL MEDIA ANIMATIONS: SAMPLE VIDEOS

PICK UP YOUR DOG POOP!
Ms. Drop's Tip for June: Pick Up Your Dog Poop!
Now that the warm weather is back, please pick up your dog poop whenever you're with your four-legged friends.
10 comments • 6.7K views

ALGAE BLOOMS & LAKE CHAMPLAIN
Ms. Drop's Tip for July: Algae Blooms and Lake Champlain
Algae blooms, or cyanobacteria, appear in Lake Champlain each summer. Certain environmental conditions, like elevated levels of nutrients from...
2 • 0 comments • 7.7K views

REDIRECT YOUR DOWNSPOUTS
Ms. Drop's Tip for August: Redirect Your Downspouts
Looking for one more summer project before the fall?
Redirecting your downspouts is a great way to reduce stormwater runoff...
1 • 0 comments • 7.4K views

FALL GARDENING
Ms. Drop's Tip for September: Fall Gardening
Fall is an often overlooked time to garden. Bulbs and perennials are best planted in the fall. Take the time to plan your garden out now and save yourself the headache next mud season!...
1 • 0 comments • 7.7K views

MULCH LEAVES, DON'T RAKE
Ms. Drop's Tip for October: Mulch Your Leaves Instead of Raking Them!
We're not done with our fall lawn care tips quite yet!
Instead of raking your leaves this year, use your mower to chop them up...
1 • 0 comments • 6.3K views

AVOID USING ROCK SALT
Ms. Drop's Tip for November: Avoid Using Rock Salt
This winter, try to avoid using rock salt on your walkways and driveway.
The salt can wash into our storm drains leading to increased water...
1 • 0 comments • 6.5K views

B. RAIN GARDEN PLANTS PDF

RETHINK RUNOFF

WHAT YOU CAN DO AROUND YOUR HOUSE
GUIDE TO RAIN GARDEN PLANTS

Rain gardens are a great way to reduce stormwater runoff around your home, but you can also make smaller changes around your garden that will help reduce stormwater. Just by including certain plants in your garden.

Below is a list of rain garden plants that you can use in your garden to help reduce stormwater runoff. All of these plants are native to Vermont. In addition, we've noted their mature height, sun exposure and when they bloom.

SALT TOLERANT PLANTS
These plants are salt-tolerant, so you can plant them near walkways, driveways or other places to get soaked during the winter.

COMMON NAME	SCIENTIFIC NAME	TYPE	HEIGHT	DESCRIPTION	EXPOSURE	BLOOM
Columbine	<i>Acquilegia canadensis</i>	Perennial	1-2'	Ornamental	Full Sun	Fall
New England Aster	<i>Aster novae-angliae</i>	Perennial	2-6'	Ornamental	Full Sun	Summer
Daylilies	<i>Heimericallis spp.</i>	Perennial	2.5-3.5'	Flowers	Full Sun/Partial Shade	Summer
Blue Flag Iris	<i>Iris versicolor</i>	Perennial	2-3'	Ornamental	Full Sun/Partial Shade	Summer
Cardinal Flower	<i>Lobelia cardinalis</i>	Perennial	2-4'	Flowers	Full Sun/Partial Shade	Summer
Black Eyed Susan	<i>Rudbeckia hirta</i>	Perennial	1'	Ornamental	Full Sun	Summer

SALT INTOLERANT PLANTS
These plants are not salt-tolerant, so you want to avoid placing them in areas away from where you salt in the winter.

COMMON NAME	SCIENTIFIC NAME	TYPE	HEIGHT	DESCRIPTION	EXPOSURE	BLOOM
Milkweed	<i>Asclepias tuberosa</i>	Perennial	1-2.5'	Orange flower	Full Sun	Summer
Coneflower	<i>Echinacea purpurea</i> spp.	Perennial	1-2'	Various include purple and white flowers	Full Sun/Partial Shade	Summer
Burnsnet	<i>Eupatorium perfoliatum</i>	Perennial	4-6'	Flat-topped clusters of small, fluffy white flowers	Full Sun/Partial Shade	Summer
Bee Balm	<i>Monarda didyma</i>	Perennial	2'	Red, pink, salmon colored flowers	Full Sun/Partial Shade	Summer
Bloodroot	<i>Sanguinaria canadensis</i>	Perennial	6-10"	White flower, toxic	Partial Shade	Spring
Red Deer Dogwood	<i>Cornus sericea</i>	Shrub	6-12'	White flowers, red stems in winter provides food and cover	Full Sun	Spring/Summer

Check out the other side for our list of salt-tolerant plants.

[Learn more at RETHINKRUNOFF.ORG](#)

C. SAMPLE SOCIAL MEDIA POSTS: NEWS

Rethink Runoff Stream Team
November 10, 2021 at 9:00 PM
Since 2005, Lake Champlain has seen a decline in the clarity of the water. In the past decade, the lake has only been frozen once for three days because of rising water temperatures, climate change, and unpredictable weather patterns. What's in store for this winter?
Lake Champlain water temperatures dip toward freezing — but will it freeze over?

Rethink Runoff Stream Team
November 10, 2021
New information sheds light on how the private sector could impact Vermont, from agriculture and forestry, and increase levels of our green space.
Vermont Climate Study Says Sweeping Change is Happening — and More Looms

Rethink Runoff Stream Team
November 11, 2021 at 3:00 PM
Lake Superior in Michigan is the only Vermont lake to be consistently over the rising phosphate levels. A plan for potentially do the same for Lake Fairlee and check for faltering health is in the works.
An action plan for Lake Fairlee's faltering health
We're so excited for the first report about Lake Superior

Rethink Runoff Stream Team
November 6, 2021
Good news for Lake Champlain. The state will be draining from lake trout. Biologists say it's a sign of a healthy population and a healthy lake.
Healthy Water: Biologists see improved health in Lake Champlain trout

D. SAMPLE SOCIAL MEDIA POSTS: CONTENT

Rethink Runoff Stream Team
November 2, 2021 at 11:00 AM
Here's a great fall tip for your lawn!
Mowing is a great way to maintain a healthy lawn. It reduces soil compaction and is a source for the production of all water and nutrients.
By following our natural lawn care techniques, you can avoid getting herbicides that end up in our rivers, lakes and streams.

Rethink Runoff Stream Team
November 14, 2021 at 11:00 AM
Don't put seeds that blow off yet!
Many people think once school starts it's time to back-lawn care until next spring. If you keep your grass too long before the first frost, your lawn can develop a moldy fungus. Try to keep it at 2-2.5 inches before the first frost.

Rethink Runoff Stream Team
November 10, 2021 at 11:00 AM
Great mowing leaves each fall!
At the best mower and chow plant out!
Proper attachment and the chopped leaves will add to your lawn as they break down over the winter... See

Rethink Runoff Stream Team
November 10, 2021 at 11:00 AM
Learn more

2021 Creative

E. SEARCH ADS: SAMPLE COPY AND VARIABLE HEADLINES

● **Winterize Your Lawn This Fall | Prep Now for Green Grass Later | 5 Tips to Winterize Your...**
www.rethinkrunoff.org
 Try these five fertilizer-free lawn care tips for green grass next summer. Avoid fertilizers wit...
[View assets details](#)

● **Rain Gardens Reduce Runoff | Choose Plants to Reduce Runoff | Can Plants Reduce Runoff? ...**
www.rethinkrunoff.org
 By choosing certain plants, you can reduce stormwater runoff & keep Lake Champlain...
[View assets details](#)

● **Build a Rain Barrel This Fall | Rain Barrels Reduce Runoff | DIY Rain Barrel Instructions...**
www.rethinkrunoff.org
 Build a rain barrel to help reduce stormwater runoff around your house. Keep rainwater aw...
[View assets details](#)

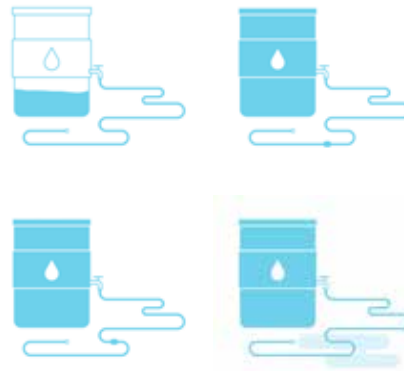
- Plan Your Garden This Fall
- Choose Plants to Reduce Runoff
- Can Plants Reduce Runoff?
- Rain Gardens Reduce Runoff
- By choosing certain plants, you can reduce stormwater runoff & keep Lake Champlain clean.
- Fall is the best time to plan out your gardens. Choose plants that will reduce runoff.
- Find out what plants can help reduce rainwater around your home.
- Choose plants that reduce rainwater runoff with our handy guide.

- Rain Barrels Reduce Runoff
- DIY Rain Barrel Instructions
- Reduce Your Water Bill
- Rain Barrels Reduce Water Use
- Build a Rain Barrel This Fall
- Want to Build a Rain Barrel?
- One More DIY Fall Project
- Collect rainwater and use it on your garden and plants.
- Build a rain barrel to help reduce stormwater runoff around your house.
- Reduce stormwater runoff and keep Lake Champlain clean with a rain barrel.

- Prep Your Lawn for Next Spring
- Fall Lawn Care That Works
- Prep Now for Green Grass Later
- 5 Tips to Winterize Your Lawn
- Toss The Scotts For Lawn Care
- 5 Fertilizer-Free Lawn Tips
- Winterize Your Lawn This Fall
- Why Rake Leaves? Mow & Mulch
- Skip The Fertilizer & Do This
- Avoid fertilizers with these five key tips. Your lawn and Lake Champlain will thank you!

F HTML 5 ANIMATIONS

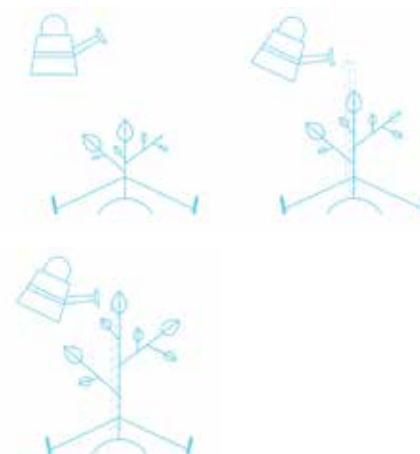
RAIN BARREL



PET WASTE



PLANTING A TREE



Media Buy Breakdown

Below is a cost breakdown of media buys, compared with previous years. We continued our Winter Campaign with a focus on both pet waste and reducing salt use. Similar to our past efforts to shift outreach year-round, our Winter Campaign ran in January and February, traditionally a quieter time from an advertising standpoint.

Digital media buys include Google ads, Facebook ads and WCAX. TV includes WCAX and Xfinity media buys.

Overall, our 2021 media buy strategy continued earlier efforts to create a more year-round approach. For 2021, we reduced our broadcast spend, pushing more into digital/digital video (Facebook, Google and YouTube).

In Fall 2021, we introduced Google Search ads, to complement Google Display ads and YouTube ads.

On the social media front, we also began promoting content-based posts that also offered a direct Call-To-Action leading to our website.

2016 – MEDIA BUY			
SOURCE	SPRING	SUMMER	FALL
RADIO	\$4,500	-	\$3,258
DIGITAL	\$7,500	-	\$4,985
TV	\$5,500	-	\$2,379
PRINT	\$2,500	-	
TOTAL	\$20,000	-	\$10,622

2017 – MEDIA BUY			
SOURCE	SPRING	SUMMER 05/28–08/02	FALL
RADIO	\$3,088	-	\$1,080
DIGITAL	\$3,600	\$3,826	\$4,582
TV	\$2,015	-	\$1,833
PRINT	\$1,755	\$585	\$1,170
TOTAL	\$13,191	\$4,235	\$8,666

2018 – MEDIA BUY			
SOURCE	SPRING	SUMMER 6/16–08/27	FALL
RADIO	\$2,675	-	\$1,044
DIGITAL	\$3,394	\$7,534	\$2,987
TV	\$3,710	-	\$2,472
PRINT	\$1,755	-	\$1,006
TOTAL	\$11,534	\$7,534	\$7,509

Media Buy Breakdown by Vendor

CAMPAIGN	WINTER	SPRING	SUMMER	FALL
WCAX BROADCAST		X		X
XFINITY BROADCAST		X		
GOOGLE	X	X	X	X
YOUTUBE		X	X	X
VTDIGGER.ORG				
VPR RADIO	X			X
WVMT RADIO		X		X
SEVEN DAYS		X		X

2019 – MEDIA BUY				
SOURCE	WINTER	SPRING	SUMMER* 5/27–09/2	FALL
RADIO	\$360	\$1,008		\$1,025
DIGITAL	\$1,800	\$2,320	\$5,830	\$3,000
TV		\$5,830		\$3,306
PRINT	\$503	\$2,012		\$1,006
TOTAL	\$2,663	\$11,170	\$5,830	\$7,509

2020 – MEDIA BUY				
SOURCE	WINTER	SPRING	SUMMER 7/1–9/1	FALL
RADIO		\$375		\$375
DIGITAL	\$1,800	\$4,557.51	\$400	\$3,430.33
TV		\$5,788.75		\$2,063.83
PRINT		\$1,579.50		\$1,053
TOTAL	\$1,800	\$12,301	\$400	\$6,922

2021 – MEDIA BUY				
SOURCE	WINTER	SPRING	SUMMER 7/1–9/1	FALL
RADIO	\$725.40	\$375		\$375
DIGITAL	\$2,640.00	\$7,380.00	\$3,429.45	\$4,195.54
TV		\$5,600.00		\$680
PRINT		\$1,455.00		\$1,053
TOTAL	\$3,365.40	\$14,810	\$3,429.45	\$6,922

Google Advertising Metric

CAMPAIGN	IMPRESSIONS	INTERACTIONS	COST
DISPLAY	3,405,317	3,287	\$4,755.87
VIDEO	571,872	339,690	\$5,704.81
SEARCH	20,488	419	\$768.16

Impressions are the number of times the ads are served to web users. For Display and Search, Interactions are the number of times a web user clicks on the ad.

Video ads are consider pre-roll or mid-roll, meaning they are shown either directly before, or in the middle of a video the web user is watching. These ads are typically skipable after the first five seconds. Interactions include web users who click on the ads, or watch the entire ad.

Facebook Advertising Metrics

CAMPAIGN	IMPRESSIONS	CLICKS	REACH	COST
MS. DROP	113,535	618	21,083	\$2,054.92
FALL 2021	571,872	87	42,513	\$680.23
WINTER 2021	10,432	139	2,258	\$200.70
PAGE LIKES	3,142	10	1,390	\$55.09

Impressions are the number of ads served to Facebook users. Clicks are the number of people who click on an ads. Reach is the number of individual Facebook users that see the ad.

Our increased focus on social media also provides us with age- and gender-related information about users who like our Facebook page (Likes) and individuals who follow our Instagram page (Followers).

In this case, reach refers to the overall unique users in each platform that have seen our posts, either through other users liking and sharing our content, users using the Explore features, or users who see promoted posts.

Facebook Likes Demographics

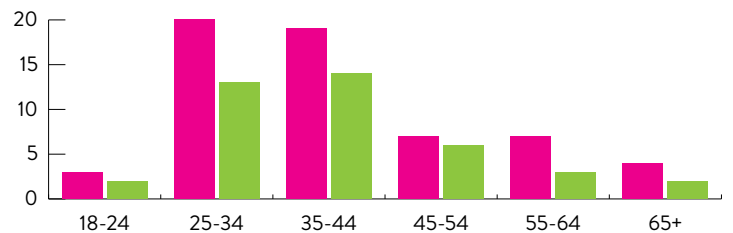
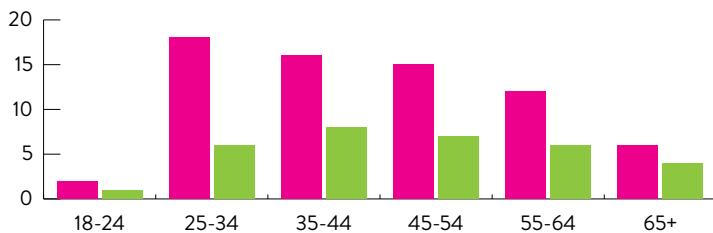
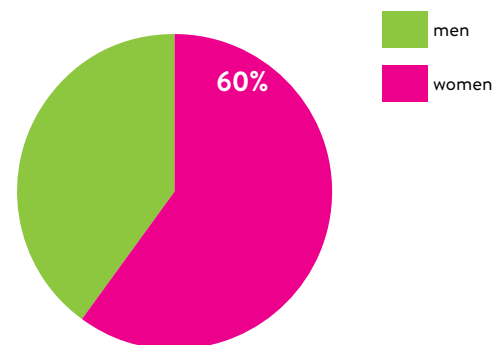
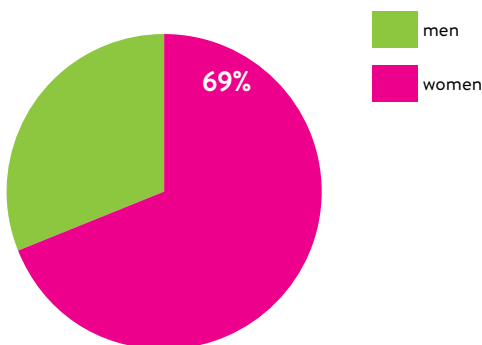
Facebook Reach: 60,998

Likes: 318

Instagram Follower Demographics

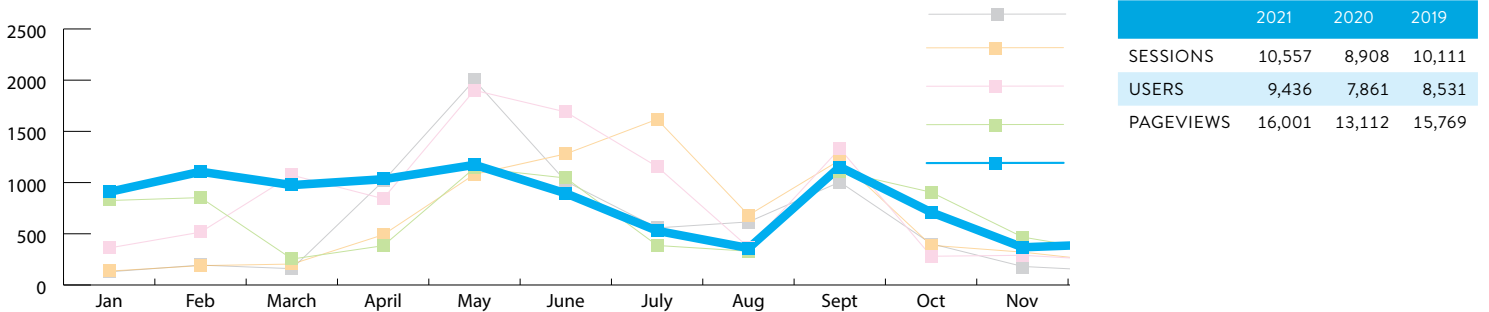
Instagram Reach: 19,384

Followers: 349



Website Metrics for 2016–2021

Our 2021 website metrics bounced back after a slower 2020 calendar year (due to COVID). Overall, our users, sessions and page views all increased by close to 20% when compared with 2020. In addition, when compared with 2019 (the last full pre-COVID year), our sessions (10,557 vs. 10,111), users (9,436 vs. 8,531), and pageviews (16,001 vs. 15,769) increased as well.



Total Sessions/Visits (1/1–12/31)

TOTAL	TIME PERIOD
10,557	2021
8,908	2020
10,111	2019
7,832	2018
7,407	2017
6,004	2016
4,659	2015
7,728	2014
3,541	2013
2,787	2012

Top Vermont Cities and Towns

TOTAL	USERS
BURLINGTON*	1,152
SOUTH BURLINGTON*	589
COLCHESTER*	539
ESSEX*	487
SHELBURNE*	196
STOWE*	65
JERICHO	58
WILLISTON	51
MIDDLEBURY	28
MONTPELIER	27

MILTON: 13
WINOOSKI 6

* SAME POSITION AS LAST YEAR

Website Visits by Device

DEVICE	2021	2020	2019	2018	2017	2016
DESKTOP	46.9%	51.25%	40.2%	50.1%	52.8%	65.7%
MOBILE	44.6%	41.28%	44%	40.6%	36.4%	24.5%
TABLET	8.5%	7.47%	15.8%	9.3%	10.8%	9.8%

Most Visited Pages

PAGE	TOTAL
HOMEPAGE	4,465 (27.90%)
/EDUCATIONAL-RESOURCES/PICK-UP-DOG-POOP/	1,239 (7.74%)
/WHAT-YOU-CAN-DO/	1,076 (6.72%)
/EDUCATIONAL-RESOURCES/REDUCE-ROAD-SALT/	702 (4.39%)
/THE-STREAM-TEAM/	551 (3.44%)
/WHAT-YOU-CAN-DO/REDUCE-FERTILIZER-USE/	551 (3.44%)
/WHAT-YOU-CAN-DO/PICK-UP-DOG-POOP/	528 (3.30%)
/WHAT-YOU-CAN-DO/PLANT-A-RAIN-GARDEN/	472 (2.95%)
/EDUCATIONAL-RESOURCES/FOR-KIDS/CREATE-YOUR-OWN-WATER-CYCLE/	460 (2.87%)
/EXPLORE-THE-LAKE-CHAMPLAIN-BASIN/	410 (2.56%)

Website Event Tracking

DEVICE	2021	2020
MAILCHIMP FORM	48	61
RAIN GARDEN PDF	56	N/A
RAIN BARREL PDF	17	8
SOIL TEST CTA	18	5
SCIENCE EXPERIMENT PDF	15	N/A

**Appendix B CHITTENDEN COUNTY REGIONAL STORMWATER
PUBLIC INVOLVEMENT AND PARTICIPATION
PROGRAM (“STREAM TEAM”)**

Minimum Control Measure #2: Public Involvement & Participation Rethink Runoff Stream Team Summary of Activities



Prepared by Winooski Natural Resources Conservation District 2021 Calendar Year

Overview

Although the pandemic continued to present challenges for the Stream Team in 2021 the Winooski Natural Resources Conservation District (WNRCD) was able to engage many residents in meaningful actions to improve stormwater in their community. We organized a watershed field-day for students in the Winooski Middle School summer school program, reinstated our volunteer water quality monitoring program, explored new opportunities for remote community engagement with the Adopt-a-Drain program and recruited volunteers to install a new rain garden at the Milton Municipal building.

RRST Estimated Impact by Municipality

The table below depicts the estimated number of individuals engaged in each RRST municipality in 2021. This table reflects **in-person** interactions where it was possible to log participants' town of residence. For information about residents reached through digital efforts on the website and social media outlets, see final report from Pluck.

Municipality	# of people reached in-person in 2021
Burlington	4
Colchester	0
Town of Essex	0
Village of Essex Junction	2
Milton	3
Shelburne	0
South Burlington	14
Williston	3
Winooski	16

TOTAL	42
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Table 1: Interaction with the Stream Team by municipality

Organizational Partnerships

The Rethink Runoff Stream Team partnered with **2** non-municipal organizations in 2021:

1. **Hamline University:** Created the Adopt-a-Drain website based on social science research to engage more volunteers in maintaining the health of storm drains in MS4 communities across the country. This year RRSST municipalities engaged in a discussion about joining the Adopt-a-Drain program. See "Projects" section for more details
2. **Winooski Middle School:** A summer school teacher at Winooski Middle School asked if RRSST could present a hands-on watershed lesson to students. See "Outreach Events" section for more details.

Outreach

Social Media

The Stream Team coordinator periodically updated the Facebook and Instagram pages with information about upcoming outreach events or volunteer opportunities.



Figure 1: Two Facebook posts from 2021 related to the Milton Municipal Rain Garden installation project

RRST Website

We maintained the "events" section of the website and occasionally helped to develop ideas for new web content in collaboration with Pluck Design.

Newsletter

At the end of 2021 there were **799** subscribers to the RRST newsletter (an increase from 770 in 2020). One newsletter was published this year in December.

Outreach Events

One "outreach" event was held in 2021. A total of **16** people participated.. The event is described in more details below:

1. **Winooski Middle School Watershed Field Day:** The Stream Team Coordinator delivered a 2-hour hands-on lesson to 12 students and 4 teachers at Winooski Middle School as part of their summer school program. Students met the coordinator at Landry Park in Winooski. The focus of the lesson was watersheds and community. Students looked at a map of watersheds that drain to Lake Champlain, built their own 3D watershed model, explored Morehouse Brook and played a game about ecological connections. Two WNRCD summer interns helped to facilitate small-group activities for students. Teachers provided positive feedback after the event and expressed an interest in continued partnership for the 2021/22 school year. Total # of people reached in-person in Winooski = 16



Figure 2: Students at Winooski Middle School participate in hands-on watershed activities at Morehouse Brook in Landry Park.

Projects -----

Three in-person "project" events were held in 2021 and planning for a fourth initiative (Adopt-A-Drain) began. A total of **29** people participated in hands-on volunteer events in their communities. The projects are described in detail below:

1. Milton Rain Garden Installation
2. Stream Team Water Quality Sampling
3. Adopt-a-Rain Garden Program
4. Planning for Regional Adopt-a-Drain Program

Milton Project: Rain Garden Planning and Installation

Summary: RRST assisted staff at the Town of Milton with the design and installation of a new rain garden at the Municipal Building on Bombardier Road. The Stream Team Coordinator provided municipal staff with a tailored list of recommended plants for the project. All project supplies were paid for by the town, but the Stream Team Coordinator did harvest about 30 perennial transplants from other over-crowded gardens to add to the planting plan. 5 community volunteers assisted with planting & mulching the garden on installation day.

Advertising: Advertising was completed through direct email outreach to our list of active volunteers, posting on social media and inviting community members to share a post on Front Porch Forum.

Impact: 5 community volunteers and three staff members participated in two planting shifts throughout the day. Volunteers learned more about the function of the rain garden and the pollinator and wildlife benefits of the plants that were selected. The area was quickly transformed from an empty hole to a beautifully planted and mulched stormwater feature. Most participants accepted a Stream Team t-shirt and sticker as thanks for assisting. The Stream Team Coordinator is currently working with town staff to design an educational sign to accompany the garden since it is in a location with high foot-traffic.



Fig 3: Community volunteers, Milton municipal staff and WNRCD communications intern help to install perennial plants in a new rain garden at the Milton Municipal Building.

Water Quality Monitoring

Summary: The Stream Team has maintained an ongoing water quality monitoring program since 2012. Community science volunteers collect water samples in urban or suburban streams that are impacted by excessive nutrient loading, high chloride and other pollution.

This year VT DEC's LaRosa Program provided financial support for analysis of the water samples at the Vermont Agriculture and Environmental Laboratory (VAEL), wrote the Quality Assurance Project Plan (QAPP), transported samples from partners' offices to the lab, and took on the responsibility of analyzing data from all state-wide partners. This change allowed us to focus more on volunteer recruitment and engagement and less on behind-the-scenes paperwork. Of note, the state-wide data analysis has not been published yet, so a Stream Team

Data Analysis document is not available with this report.

Fourteen Stream Team volunteers collected biweekly water quality samples at fourteen sites on eight streams in 2021. Volunteers collected biweekly grab samples from June 2 - August 11. Grab samples were analyzed for total phosphorus, chloride, and at some sites, nitrogen. These parameters were also sampled at all sites after two rain events. Eight of the sites were new this year and some required special equipment for sampling like a throw-bucket or dipper stick. Appropriate tools were purchased and/or created to assist with sampling while maintaining volunteer safety around swift waters.

The training day for volunteer samplers took place in late May. This year two sessions were offered - one in person at the stream adjacent to the WNRCD Williston Office and one online - to accommodate volunteers' schedules and comfort with gathering in-person. During both trainings the Stream Team coordinator demonstrated sampling procedures, described the data collection sheets, explained how the collected data would be used and answered questions. Throughout the season, volunteers returned their samples through a contactless dropoff system to the WNRCD office. The Stream Team coordinator ensured all samples were properly checked-in and prepared for delivery to the lab. The Stream Team coordinator sent bi-weekly emails to WQ volunteers to check in about sampling procedure and share interesting local water tidbits, and other ways to get involved.

Advertising: Advertising was completed through direct email outreach to our list of active volunteers. Recognizing that covid-restrictions may make a fully in-person training impossible, we targeted samplers with prior experience. Next year we look forward to adding new volunteers to the team.

Impact: In total volunteers collected 250 individual samples. This data provides information about long term trends that may help towns analyze effectiveness of stormwater BMPs or identify new opportunities for action. Perhaps more importantly, we believe that engaging community members directly in clean-water work creates greater public understanding of the issues VT watersheds are facing and creates greater public support for clean-water initiatives like GSI installation or wastewater treatment plant improvements. In 2022 we plan to add data from this sampling season to the Stream Storytelling online map and use it as an educational tool during outreach events.



Figure 4: Stream Team volunteers collect water samples at sites at various sites across the RRST service area

Stream Team Volunteers 2021	
Municipality	# of Volunteers
Burlington	3
Colchester	0
Village of Essex Junction	2
Town of Essex	0
Milton	1
South Burlington	6
Shelburne	0
Williston	1
Winooski	0
Non -RRST Municipalities	1
TOTAL	14

Table 2: Stream Team Water Quality Sampling Volunteers by town



Fig 5: Stream Team Water Quality Sampling sites map. See interactive online version here: https://www.google.com/maps/d/u/O/edit?mid=1SP_lsNKpOTLeedEOuaGgRXeEcyNGrGrO&usp=sharing

Adopt-a Rain Garden Program Summary

The Stream Team's Adopt-a-Rain Garden program is an opportunity for individuals to assist in keeping public rain gardens in their community functional and attractive. This involves basic maintenance activities like picking up trash, pruning, pulling weeds, installing new mulch, and informing the coordinator of non-functioning gardens. There are currently seven public rain gardens managed by Stream Team. In 2021 all seven gardens were cared for by approximately 10 volunteers. The gardens that have been removed from this list are either now cared for by municipal staff or hired landscaping crews, so it is no longer appropriate to recruit community volunteers. We plan to add 1-4 new gardens for adoption in 2022. See table below for more details.

Rain Garden Volunteers 2021	
Location	Adopter Name
Williston Annex	Rita D.
Callahan Park, Burlington	Brad K.

Chamberlin School, South Burlington	Chris P.
Coast Guard Station, Burlington	Larry K.
Farrell Park, South Burlington	Roan O.
South Burlington Fire Station	Cub Scouts 678
South Burlington Library	Cub Scouts 678

Table 3: 2021 Rain Garden Adopters 2021

Regional: Adopt-a-Drain Launch

Summary: This year we completed significant behind-the-scenes research and coordination to launch a robust Adopt-a-Storm-Drain program similar to Adopt-a-Rain-Garden. Based on early interest from the Village of Essex Junction and the City of Burlington in improving and/or starting new storm drain steward programs and based on the success of a small pilot program in 2020 (see 2020 RRST Annual Report) we began to explore options for offering "Adopt a Drain" as a rotating program for interested municipalities. The goal of the program would be to recruit volunteers to care for storm drains in their neighborhood by clearing trash, sediment, salt and other pollutants on a regular basis.

In early conversations we discussed the feasibility of municipal staff creating and maintaining in-house interactive maps where volunteers could view "adoptable" drains and sign up to help. After discussing the idea with GIS specialists in multiple towns (including Burlington where a pilot platform had already been developed, but experienced technical difficulties), the [Adopt-a-Storm-Drain](#) initiative developed by Hamline University was brought to our attention.

Adopt-a-Storm-Drain is a model developed by staff at Hamline University based on research about best practices for community engagement around stormwater. Their website offers a template for towns to input available drains and for volunteers to sign up and find training resources easily. Their interface is supported by technical staff at the university, which means we can spend more time engaging people in our communities and less time working on coding and data management.

Challenges: The main challenge of this project was that the Adopt-A-Storm-Drain package comes at an additional cost to current MS4 dues. With most MS4 staff and the Stream Team Coordinator working and meeting remotely, the process of discussing this opportunity was lengthy. Gauging the level of interest from each municipality and assessing which funding options would be most feasible took many months, but we have now determined the cohort of municipalities that would like to participate and plan to move forward with a project launch in 2022.

Impact: With the Chittenden County RPC as the administrative partner, the five MS4 communities entered into an MOU with Hamline University (effective Jan 2022) to gain access to the web platform and volunteer training resources. The Stream Team Coordinator will help to

launch the program by taking the lead on volunteer recruitment as a core goal for 2022. We believe launching the Adopt-a-Storm-Drain program is a great fit for these communities in a year that will still be impacted by COVID restrictions. We anticipate that this program will engage hundreds of community volunteers in a project that can be completed without requiring any in-person interaction. Adopting a storm drain is a small and simple action that may inspire community members to participate in other Rethink Runoff activities in the years to come and consider the ways water flows through their neighborhood.

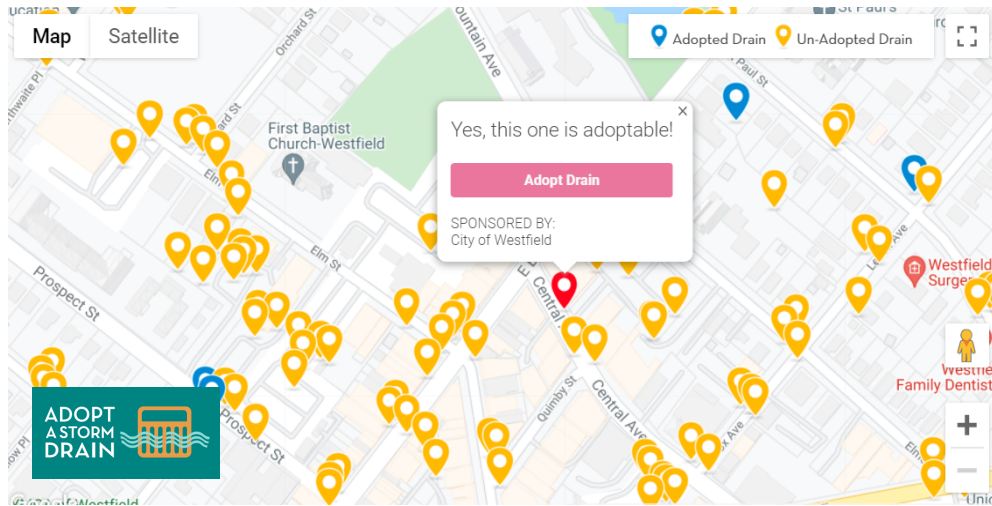


Figure 6: Screenshot from Adopt-a-Drain Website illustrating volunteer sign-up map format

Volunteer Appreciation Summary

Due to covid we were not able to host an in-person volunteer event. All volunteers were offered Stream Team t-shirts and stickers at the time of the event and many accepted one or both. We are planning to send handwritten thank-you notes and a small gift in the mail to our most dedicated volunteers in early 2022.



This document was prepared by the Winooski Natural Resources Conservation District, which is contracted by Chittenden County's MS4 Committee to run the RRST program.

**Appendix C Lake Champlain Basin Phosphorus Control
Plan Progress Report Memo**

March 29, 2022

To: Christy Witters and Emily Schelley
Vermont DEC Stormwater Program

From: Amy Macrellis & Warren Rich, Stone Environmental
Jenn Callahan, Vermont Agency of Transportation

MEMO

Stone Project No. 20211273 | 18-008-E

Subject: Lake Champlain Basin Phosphorus Control Plan, Vermont Agency of Transportation –
Progress Report

On behalf of VTTrans and in accordance with *NPDES General Permit 3-9007 for Stormwater Discharges from the State Transportation Separate Storm Sewer System (TS4)* Section 9.2.D, Stone is pleased to submit this Progress Report summarizing actions taken to implement all Phosphorus Control Plan (PCP) components. This submittal includes a progress report on crediting for impervious and pervious acres managed, and BMPs implemented, through December 31, 2021 and provides updates to estimated extent of completion for remaining items and schedule as of December 31, 2021.

1. Extent of BMP implementation

In the last progress report (submitted September 30, 2021), documentation of historic and current operations, and projection of current operations through the term of the first VTTrans Phosphorus Control Implementation Plan (PCIP)¹ (submitted October 1, 2020) was updated in the implementation model to account for capital projects and maintenance activities completed through December 31, 2020. Plan review, maintenance activity review, and culvert and swale inventory review and crediting activities are in progress for reductions achieved by VTTrans between Jan. 1 and December 31, 2021 with accounting completion anticipated in June 2022.

Below, we briefly summarize activities undertaken and progress documented in July-December 2021, organized by the suite of necessary BMPs set forth in the VTTrans PCIP.

1.1 Tracking and Accounting

VTTrans continued development of a tracking and accounting system, working to integrate with and build from its Vermont Asset Management Information System (VAMIS). The originally developed PCP road segment dataset was refined to standardize road segment lengths while preserving key attributes, such as hydrologic

¹ https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/TS4/VTTrans_PC_Implementation_Plan_2020_10_01_2021_03_12.pdf

connectivity and road slope, and to reference the VTrans Linear Reference System (LRS) for locating road segments. Refinements to the TS4 ditch inventory that were field-tested in the summer of 2021, including dividing swales to correspond to road segments and to Small Culverts Inventory (SCI) cross culverts, were continued for swale assets in the Lake Champlain Basin (LCB), with completion estimated in spring 2022. VTrans anticipates that development of an automated system for tracking and accounting changes in structural corrections to road drainage deficiencies will commence in late spring 2022.

1.2 Structural Correction of Road Drainage Deficiencies

The *VTrans Phosphorus Control Highway Drainage Management Standards (August 3, 2021)* submitted in the Sept. 30, 2021 progress report is under revision to integrate the VTrans Short Structures asset inventory into the existing drainage standards and phosphorus crediting framework. Larger culverts, including many concrete box culverts now being installed by VTrans to replace undersized structures, are tracked in the Short Structures asset inventory instead of in the SCI, which includes only culverts that are six feet in diameter or smaller.

These standards, and the menu of standard BMPs and maintenance activities that may be undertaken to bring road segments and related assets ‘up to standards’, are living documents and will be updated periodically as conditions warrant.

Correction of road drainage deficiencies, as documented in MATS and in programmed capital projects during calendar 2021 is underway, with completion of summaries and credit accounting in the implementation model estimated in June 2022.

1.3 Structural Correction of Road Erosion Issues

Specific crediting mechanisms for stabilization and treatment of areas of localized erosion caused by roadway runoff remain in development. VTrans, with DEC, participated in the research project *Quantifying Nutrient Pollution Reductions Achieved by Erosion Remediation Projects on Vermont’s Roads*, which was completed in June 2021. While the study was valuable, the findings did not include an actionable phosphorus crediting strategy. VTrans participated in further dialogue with ANR in December 2021 regarding P crediting for outlet and gully restoration BMPs as represented in ANR’s *Draft Standard Operating Procedures for Tracking & Accounting of Developed Lands Regulatory Projects & Non-Regulatory Clean Water Projects*. VTrans remains ready to assist as warranted.

Correction of minor areas of localized erosion as documented in MATS and in programmed capital projects during calendar 2021 are being summarized and credited in the implementation model, with completion of summaries and credit accounting in the implementation model estimated in June 2022.

1.4 Non-Structural Controls

Lane miles swept and drop inlets (DIs) cleaned in calendar 2021 are being summarized and credited in the implementation model, with completion estimated in June 2022.

1.5 Structural Stormwater Treatment Practices

Information about existing and planned structural stormwater treatment practices (STPs) throughout the TS4 is updated in the TS4's BMP Tracking Table and in the implementation model as practices move through design or are constructed. The current BMP Tracking Table is being submitted as part of the 2021 TS4 Annual Report. Updates to the PCP implementation model are underway for completed structural STPs following the 2021 construction season.

1.6 Natural Resource Restoration Projects

Natural resource restoration projects, and particularly floodplain restoration projects, may be credited as stormwater treatment practices in the context of the VTrans PCP if the floodplain area to be restored is also connected to a TS4 roadway or other VTrans-controlled contributing drainage. Since the PICP submittal, VTrans continues to complete preliminary evaluations of specific floodplain restoration projects for P reduction credit. The potential for floodplain restoration, bank stabilization, and other relevant practices were evaluated in the Potash Brook watershed near the I-89/I-189 interchange. In 2022, an outlet and gully stabilization practice may be added to the Potash Brook FRP design project.

More exhaustive evaluation of how to execute and credit floodplain reconnection will be possible through application of results from Vermont's Functioning Floodplains Initiative (FFI). Phase I outputs, including a web-based application, are anticipated in the spring of 2022. The initiative is developing and applying methodologies for evaluating river reach and watershed-scale restoration of stream, riparian, wetland, and floodplain function. Phosphorus crediting strategies are in development between the FFI technical team and Vermont ANR in the fall of 2021 and early winter of 2022.

2. Estimate of extent of completion for remaining items

The draft implementation schedule as presented in the October 1, 2020 PCIP remains generally accurate. Both the schedule and the implementation model are planning-level documents only and will be subject to continued adjustment as the implementation plan is executed. The base assumptions used to populate the model remain unchanged from the Generalized PCP submittal. Updates to those assumptions, particularly assumptions related to implementation costs, will continue as plan execution proceeds.

The implementation model submitted with the September 30, 2021 progress report is being updated to summarize activities completed and crediting for calendar 2021, with accounting completion estimated in June 2022.

3. Assessment of ability to meet remaining schedule items

VTrans is presently on or slightly ahead of schedule and is capable of meeting remaining schedule items. As implementation of the PCPs proceeds, if any changes in ability to meet schedule items arise, VTrans report on schedule adjustments as warranted.

4. Written designer statements

Subpart 9.2.D.4 of the TS4 General Permit requires submittal of *a written statement signed by a designer acceptable to the Secretary that any structural BMP build or implemented within the preceding 6 month period was constructed in compliance with the approved plans*. No structural BMPs requiring written designer statements were completed explicitly for the VTrans PCP within the preceding 6 month period.