



CITY OF BURLINGTON

PHASE II STORMWATER  
2012 ANNUAL REPORT

General Permit #3-9014  
NPDES Permit #VTR040000

Submitted by:  
The City of Burlington  
Stormwater Management Program  
Burlington Public Works

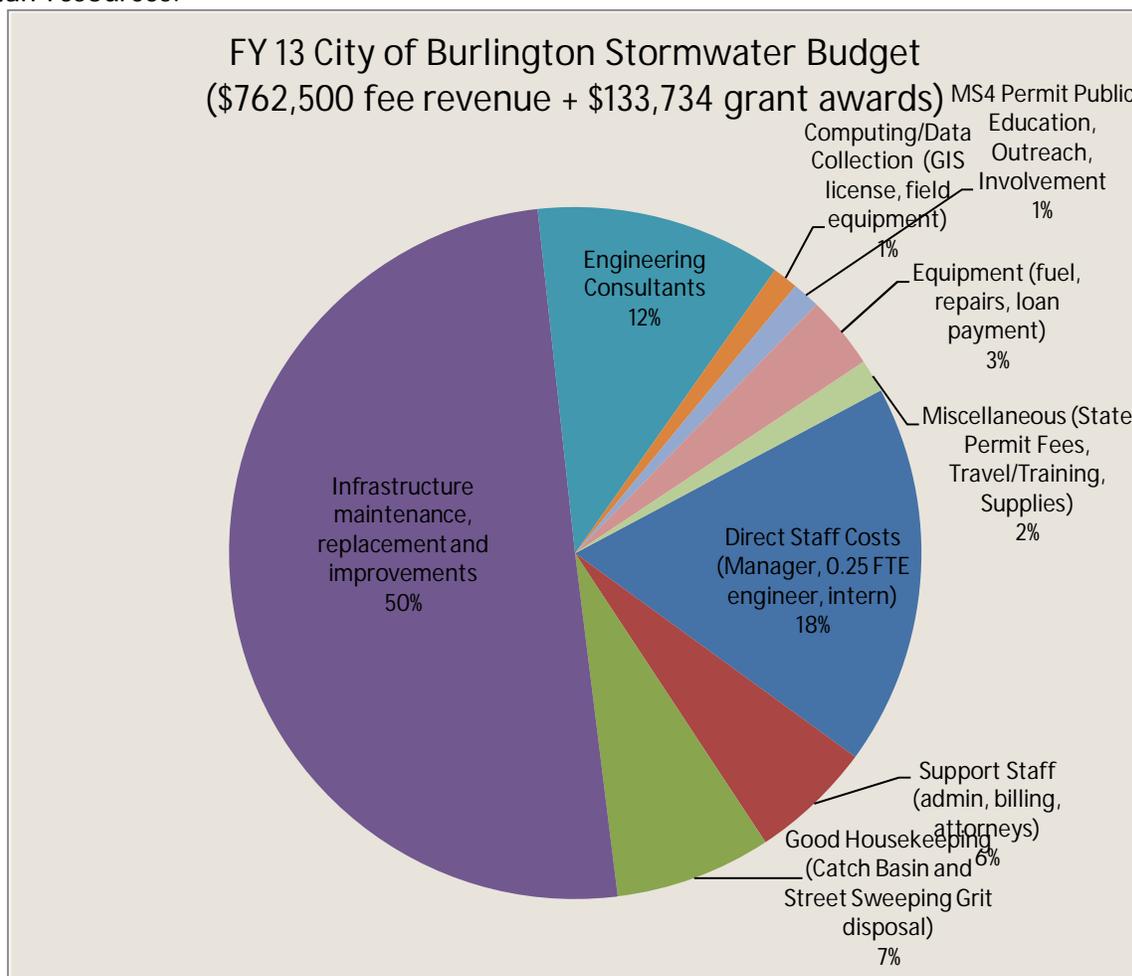
April 2013

## A. INTRODUCTION

This report is being submitted as part of the City of Burlington's Phase II Stormwater Plan per the NPDES (National Pollution Discharge Elimination System) requirements. It follows the same format used in previous years and includes the following information as discussed in Section H of the city's plan:

- Status of compliance with permit conditions.
- Results of information collected.
- A summary of stormwater activities planned for the next annual cycle.
- Any proposed changes as outlined in Section F of the stormwater plan.
- If applicable, provide notice as to whether or not another entity is responsible for any of the permit obligations.

Overall we continue to invest significant dollars in maintaining and improving our stormwater system while maintaining compliance with the MS4 permit. The biggest barrier to increased implementation is currently available staff resources.



## B. STATUS OF COMPLIANCE WITH PERMIT CONDITIONS AND INFORMATION RESULTS

This section outlines efforts taken by the City of Burlington under each of the six minimum control measures in accordance with our revised Stormwater Management Plan (2008).

### 1. Public Education/Outreach Program

The City of Burlington continues to be a participant (\$5000 annual fee and participation on the steering committee) in the Chittenden County Regional Stormwater Education Program (RSEP) in accordance with section E1 of the stormwater plan.

During the 2012-2013 program year (March 1, 2012 through February 28, 2013), the Regional Stormwater Educational Program (RSEP) focused on using paid media and a drive to website to educate the public about the effects of stormwater runoff on water bodies and the simple steps that the public can take to reduce these effects. As in previous years, key messages of the campaign have remained the same, and include stormwater runoff and stormwater systems education, tips on prevention methods related to pet waste, car washing, fertilizer/chemicals, and home construction erosion or debris. The focus of this program year was, again, to reduce fertilizer use and runoff through the use of soil testing to determine if fertilizer was needed. Marketing Partners, Inc. continues to work on a contract basis with RSEP to implement the public outreach campaign. The complete 2012 Summary can be found in Appendix A, pages 11-12. We look forward to the next permit cycle when the messages and approach can be re-evaluated to ensure maximum effectiveness.

The Burlington Stormwater Management Program (BSWMP) and the Department of Public Works continues to use social media tools including Front Porch Forum, FaceBook – 241 likes (up from 149 in 2012) and Twitter – 728 followers (up from 479 in 2012) to communicate information about projects and share information about workshops and meetings. Follow us at @btvdpw on Twitter or <http://www.facebook.com/BTVDPW> on Facebook.

Our Stormwater website has been updated to include information about upcoming and recent projects: <http://www.burlingtonvt.gov/DPW/Stormwater/Stormwater-Projects/>

### 2. Public Involvement/Participation

As a participant in the Chittenden County Stream Team (\$1800 annual fee and participation on the steering committee) Burlington has benefitted from the various workshops and opportunities that have been created throughout Chittenden County. Even though Burlington was not a “town of focus” in 2012, approximately 400 citizens have interacted with the CCST in some way, and 19 citizens were participants in a variety of hands on projects, including the Salmon Hole Clean up (7), Landry Park Rain Garden Clean up (2), Farrell Street Rain Garden Clean up (4), Water Quality Monitoring/Training (3), and Adopt a Rain Garden (3). Through CCST/Let It Rain two of our public rain gardens have been adopted. (Appendix B, pages 13-18).

On May 5, 2012 volunteers showed up in great numbers for Green Up Day in Burlington with 335 volunteers total on Green Up Day itself, and another 192 on days prior to Green Up Day. In total, volunteers collected 4.05 tons of garbage and 102 tires and 0.1 cubic yards of scrap metal. As in previous years, the Englesby Brook watershed was targeted on Green Up Day along with cleanups on the Winooski River and North Beach.

### 3. Illicit Discharge and Elimination (and Outfall Inspections)

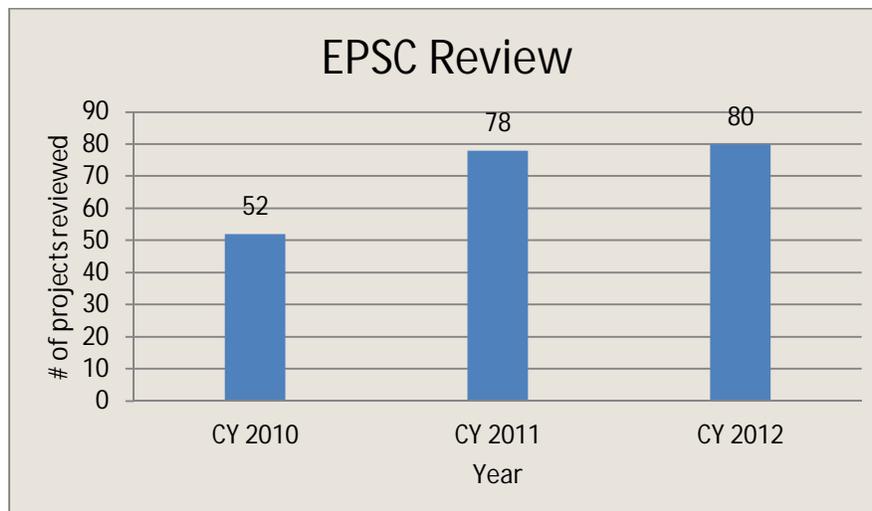
We are continuing work to locate outfalls, GPS them with our high resolution unit for ease of locating in the future, test for illicit discharges and inspect outfalls discovered as part of the mapping update process in 2013. To date we have approximately 13 outfalls out of a new total of 74 public outfalls left to inspect and test –

including those which are buried and which may have to be tested using an upstream manhole until the outlet can be accessed. This final inventory and testing will be completed prior to the submission of the new SWMP and NOI.

We continue to find that a number of our outfalls are in poor to failed condition due to their location on steep slopes and due to the intense storm events that we have experienced in recent years. Prioritizing which outfalls are in most need of repair and final engineering and implementation cost estimates will be part of the Clean Water SRF funded planning work that we now hope to launch in 2013, as we were unable to pursue this in 2012 due to lack of staffing resources.

#### 4. Construction Site Stormwater Runoff Control

Article 3 of Chapter 26 of the City Ordinance “Wastewater, Stormwater and Pollution Control” continues to provide for stronger local regulatory oversight of projects engaging in earth disturbance. Specifically, all projects disturbing greater than 400 sq. ft. are reviewed by BSWMP for compliance with minimum Erosion Prevention and Sediment Control measures.



#### *Project Review*

In 2012, approximately 80 projects were reviewed and accepted under this program. All projects are reviewed for compliance with State jurisdictional triggers related to earth disturbance, thus ensuring that the project complies with VT DEC requirements.

At minimum, projects must submit a “Small Erosion and Sediment Control Form” which is reviewed by DPW (see [link](#) on DPW website<sup>1</sup>). Projects subject to Major Impact, Subdivision or Planned Unit Development zoning permit review must submit a more formal EPSC plan typical of that which is submitted to the State. As part of approval of the small project plan, a moderate plan or a major plan, a formal acceptance letter and notice has been established to clearly outline any additional conditions and inspections that may be required. If the project requires a state CGP or INDC, applying for and providing proof of coverage prior to construction is included in the conditions of the City Stormwater Approval.

<sup>1</sup> <http://www.burlingtonvt.gov/DPW/Stormwater/Stormwater-Management/>

Projects that are reviewed are entered into and tracked in the City's land record based permitting database currently used by the Planning & Zoning, Code Enforcement and Trades Inspection programs. Code enforcement has been working with the BSWMP to ensure that sites have been stabilized prior to issuance of certificates of occupancy.



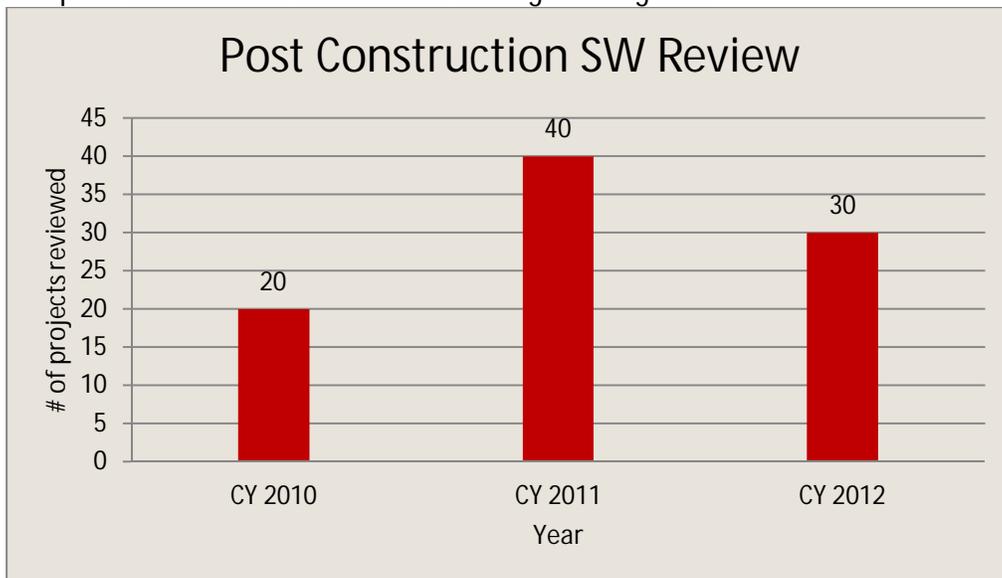
*Example of a discharge from a project site; and the site contractors cleaning up after notification.*

#### *Programmatic Development*

Work continues to refine the level of review based on the risk (disturbance area predominantly, though slope and proximity to waters will also play a factor) in order to simplify the review, documentation and close out process in favor of more frequent inspections and compliance follow up. Additional staff is necessary to pursue the level of compliance necessary for effective ordinance implementation.

#### 5. Post-Construction Stormwater Management in New Development and Redevelopment

Article 3 of Chapter 26 of the City Ordinance "Wastewater, Stormwater and Pollution Control" also provides for the stormwater management review of projects disturbing greater than 400 sq. ft. Though all projects that disturb more than 400 sq. ft. require formal EPSC review, a smaller subset of projects are specifically reviewed for compliance with post-construction stormwater management goals.



### *Project Review*

In 2011, approximately 30 projects were formally reviewed and accepted. All projects are reviewed for compliance with State jurisdictional triggers related to the creation of new impervious or redevelopment of impervious, thus ensuring that the project complies with VT DEC requirements. Residential (single family or duplex) properties with total proposed impervious surface greater than 2500 s.f. (the average amount of impervious for these uses) continue to be required to submit a "stormwater questionnaire" to evaluate whether or not they are increasing the amount of connected impervious substantially. Technical assistance and a site visit are often necessary to help the homeowners fill out the form as well as to help them minimize the amount of connected impervious. BMPs for mitigation of residential impervious include disconnected downspouts, strip driveways and rain barrels.

Commercial projects with increases in impervious or significant redevelopment are reviewed and are required to treat/detain (depending on the sewershed/watershed) 100% of the net new impervious as well as a significant portion (25 - 50%+) of existing/redeveloped impervious. Typical stormwater BMPs include pervious pavers, pipe storage, sand filters, drywells, subsurface infiltration systems and tree plantings.

If the project requires a state stormwater 9015 or INDS permit, applying for and providing proof of coverage prior to construction is included in the conditions of the City Stormwater Approval.

Projects that are reviewed are entered into and tracked in the City's land record based permitting database currently used by the Planning & Zoning, Code Enforcement and Trades Inspection programs.

### *Programmatic Development*

While all projects disturbing 400 sq. ft. of earth are eligible for stormwater review by the BSWMP, in practice we are focusing predominantly on 1) commercial properties that are increasing impervious surface and/or undergoing significant redevelopment and 2) residential projects where the property has, or will be creating, more than the average amount of impervious associated with single family homes or duplexes (~2500 s.f.)

We continue to document and codify jurisdictional triggers for the various levels of stormwater review and the specific runoff management standards and to eventually incorporate these formally into Chapter 26 and/or a formal Burlington Stormwater Manual. Currently the working jurisdictional framework is based a combination of use (residential vs. commercial), amount of total impervious on the property and amount of net new impervious and redevelopment. The standards that must be met vary slightly based on whether the project discharges to the separate storm system vs. the combined sewershed, and then for projects in the separate storm sewer, whether they are discharging to Lake Champlain, the Winooski River, an impaired stream or an unnamed tributary (many of which are experiencing erosion).

### *City Stormwater Pollution Mitigation Projects*

See <http://www.burlingtonvt.gov/DPW/Stormwater/Stormwater-Projects/> for more detailed information on these and other projects .

In 2012, the City, with the assistance of grant funding from LCBP and VT DEC completed a water quality remediation project involving the stabilization of an eroding swale with turf reinforcement matting (vs. rip rap), the installation of a swirl separator for pre-treatment of stormwater, and the restoration of a highly degraded urban wetland –providing for treatment of stormwater from 1.5 acres of previously untreated impervious before discharge to Blanchard Beach on Lake Champlain.



*Blanchard Beach Wetland Restoration and Water Quality Improvement Project (Funded by LCBP, VTDEC and City of Burlington). Treats 1.5 acres of previously un-treated impervious.*

With the assistance of a 319 grant we have designed Burlington's first Silva Cell/Stormwater Tree filter installation which will be installed in May/June 2013. We were also the recipients of a grant support for a Stormwater Retrofit Planning Study for the College Street Storm Drain System (VT DEC ERP) and for a series of fact sheets on Stormwater Friendly Driveways (LCBP).

6. Pollution Prevention and Good Housekeeping for Municipal Operations  
*Catch Basin Maintenance and Street Sweeping*



*Note: Please see update to 2011 amounts which were previously underestimated*

This year we cleaned and inspected over 1000 catch basins and continued to sweep the City's 96 lane miles of roadway are swept at least once annually, with many areas swept more frequently. Every spring Operation Clean Sweep occurs. This uses the city's snow/maintenance lights to get parked cars off the streets, and involves three to four sweepers working nights to thoroughly clean every street. The BSWMP is also working with the Right of Way Group to identify streets that need more frequent cleaning.

### *Mapping:*

Mapping/inventory activities continued in 2012 with a focus on stormwater conveyance features in the Englesby Watershed. Elevations of all manholes were captured using a high resolution RTK GPS and manholes without inventory information (inlet/outlet elevations) were inventoried. Outfalls within Englesby were also GPS'd. Due to the size and complexity of the conveyance system, we are still undergoing significant QA/QC to verify correct connectivity of lines between the high resolution GPS points.

As per our goals, we acquired a high resolution (capable of centimeter level accuracy) GPS to assist in maintaining an updated GIS database. A Stormwater intern provided data entry support to enter catch basin cleaning and inspection records for 2011 – August 2012.

### *Pollution Prevention:*

We successfully installed an improved vehicle wash area for our DPW yard consisting of sedimentation tanks and a Koala oil/grit separation system.

The Department of Parks and Recreation continues to manage 12 dog bag stations across the city; average annual bag usage is 110,000 dog poop bags.

### *Employee Education*

Employees of the Department of Public Works regularly attended a variety of trainings/presentations and a conference during 2012 to gain additional information related to the various minimum measures:

- Municipal Employee Training – “Spill Prevention and Mitigation” – September 27, 2012 ( 3 employees)
- AWSPs webinars
  - Retrofit This – A Guide to Retrofitting the World? – February 29, 2012 (1 employee)
  - Customizing Your Stormwater BMP Design for Specific Pollutants – December 12, 2012 (1 employee)
- Up By Roots: Healthy Soils and Trees in the Built Environment – June 5, 2012 (1 DPW, 1 Parks & Rec)

Other activities completed:

- Updated City impervious data (manual delineation of directly assessed parcels) for ISU rate study in preparation of FY14 budget development and possible rate increase to more appropriately fund the BSWMP

### C. ACTIVITIES PLANNED FOR THE CURRENT ANNUAL CYCLE

All activities starting in 2013 shall be in accordance with the current management plan and/or with the upcoming new stormwater management plan for the new MS4 permit that will be submitted with our NOI. This includes training, construction site review and monitoring, post-construction review of new projects and monitoring of completed projects, and continued review of municipal operations.

Continued/Additional activities planned for 2013:

#### *MM1:*

- Continue to increase use of social media to communicate with citizens regarding stormwater topics including homeowner stormwater management tips, workshop opportunities and driving traffic to Stormwater website and Smartwaterways.org

- Maintain a dynamic City Stormwater website to include information on stormwater related workshops and presentations (“Get Involved”) and stormwater related projects (“Projects”); provide a map of stormwater projects (public and private)
- Continue to update “Stormwater Links” on City Stormwater website to include more up-to-date and interesting links

*MM2:*

- Promote the rain barrel making workshops being held at Resource via outreach mechanisms above. Subsidize cost for Burlington residents to attend workshop.
- Promote the WNRCDC “Let It Rain” or similar programs; provide additional subsidies for Burlington citizens if fiscally possible
- Partner with “Blue” program to assist 40+ residences in managing their residences in a more water quality friendly manner.
- Explore possibility of providing rebates/grants to homeowners who are installing stormwater management practices (rain barrel, rain garden, pervious pavement etc.)

*MM3*

- Complete outfall inspection, IDDE and high resolution mapping for “new” outfalls.
- Locate private outfalls in advance of updated SWMP requirements for new MS4 permit.

*MM4:*

- Pursue hire of stormwater staff person to provide support in review and compliance of EPSC process.
  - Increase # of field inspections, minimum 25% of projects [Continue]
- Revise construction stormwater review process in AMANDA permit database to streamline review and project signoff based on project “risk” [Continue]
- Develop “sample applications” for small projects [Continue]  
Develop EPSC project forms/checklists for moderate and major projects [Continue]

*MM5:*

- Revise post construction stormwater management review process in AMANDA permit database to streamline review and project signoff based on project impact (amount of total and new impervious)
  - Finalize jurisdictional guidelines and management plan standards for all projects [Continue]
- Inspect/obtain inspection certification from minimum of 50% of projects with stormwater management installed under Chapter 26 [Continue]
- Implement grant funds from VTDEC (\$35K) to identify locations and provide conceptual engineering and cost estimates for stormwater retrofits in the College Street Storm Drain System
- Install a SilvaCell Tree/SW trench on Upper Cherry Street
- Create Stormwater Friendly Driveway Fact Sheets

*MM6:*

- Clean a minimum of 850 catch basins (~1/3 of city’s CBs) with an emphasis on MS4 basins vs. catch basins draining to the combined sewer; record inspection data on CB inspection and cleaning form
  - If possible, enter previous years’ inspection data into new GIS asset database for historical record
- Develop a map of known corrugated metal stormwater pipes in system; begin video assessment of these pipes (estimate 10% - 25% of network to be video’d) for incorporation into SW infrastructure

capital improvement plan [**Continue**]

- Using Clean Water SRF, prioritize outfall repair list for outfalls in poor condition [**Continue**]
- Develop method (forms/GIS) for tracking street sweeping activities [**Continue**]
- Evaluate barriers to increasing street sweeping frequency

D. PROPOSED CHANGES TO THE STORMWATER PLAN OR TIMELINE

Our MM2 compliance will be fulfilled, in part, by our participation and payment into the Chittenden County Stream Team. However, we will continue to support Green Up Day and will also look for other opportunities to increase public participation, including promoting and, where possible, subsidizing Burlington citizens' participation in workshops (ResourceVT make your own rain barrel workshops), grant opportunities (Let It Rain) and through our partnership with the "Blue" program. Any other changes to our stormwater plan or timeline will be provided in the revised NOI and SWMP that is due for the new MS-4 Permit in June 2013.

The contact for general correspondence (note mailing address vs. physical address given in 2011 report) is:

Megan Moir  
Stormwater Plangineer  
Mail: P.O. Box 878  
Burlington, Vermont 05402  
[mmoir@ci.burlington.vt.us](mailto:mmoir@ci.burlington.vt.us)  
802-540-1748 (ph)  
802-734-4595 (cell)

E. CHANGE IN RESPONSIBILITY FOR PERMIT OBLIGATIONS

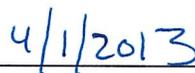
No changes are proposed at this time.

F. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



\_\_\_\_\_  
Megan Moir, CPESC, CPSWQ,  
Stormwater Program Manager



\_\_\_\_\_  
Date Signed

**Chittenden County Regional Stormwater Educational Program  
Annual Review: 2012- 2013 Program Year Summary**

The 2012-2013 program year (March 1, 2012 through February 28, 2013) of the Regional Stormwater Educational Program (RSEP) maintained a consistent stream of public education and outreach. This year's program focused on using paid media and a drive to website to educate the public about the effects of stormwater runoff on water bodies and the simple steps that the public can take to reduce these effects.

As in previous years, key messages of the campaign have remained the same, and include stormwater runoff and stormwater systems education, and tips on prevention methods related to fertilizer/chemicals. The focus of this program year was to reduce fertilizer use and runoff through the use of soil testing to determine if fertilizer was needed.

Marketing Partners, Inc. continues to work on a contract basis with RSEP to implement the public outreach campaign. RSEP Communications Plan goals achieved in 2012-2013 have included:

- The 2012 program year spring media campaign. The media campaign included four weeks of radio spots on VPR, WCPV, and WEZF; four weeks of cable TV spots in the Chittenden County area; four weeks of spots during local news on broadcast TV; print ads in member community newspapers; and three weeks of advertising on Front Porch Forum (an opt-in community e-newsletter). The spring 2012 media expenditure totaled \$19,766 (approximately the same spending as spring 2011).
- The Fall 2012 media campaign. Another paid media campaign was completed throughout Chittenden County in fall of 2012 that consisted of two weeks of print ads in member community newspapers; two weeks of radio spots on VPR, WCPV, and WEZF; two weeks of cable TV spots in the Chittenden County area; and two weeks of placement on Front Porch Forum. Broadcast television was eliminated to increase online sponsorships. The fall 2012 ad campaign budget totaled \$10,000. This also was approximately the same budget for fall media compared to fall 2011.
- Extension of the "Soil Test" campaign in partnership with the University of Vermont (UVM) Agricultural Testing Lab to provide residents within the MS4 a free soil test. The ad campaigns drove people to the RSEP website where 226 eligible residents downloaded a printable coupon during this program year. UVM continues to track the number of coupons redeemed during paid media campaigns running in the spring and fall. Thirty-nine tests were submitted (an increase of three over 2011-2012).
- Increased website traffic to the soil test page by more than 36% to 803 visits (although overall website visits remained steady).
- Continued compiling of website visibility tracking data and coupon download and redemptions in order to monitor outreach effectiveness.

## Gross Impressions/Audience Reach, 2011-2012 Program Year Summary Chittenden County Regional Stormwater Educational Program

### 1. Unpaid Media (Public Relations)

Program year 2012-2013 did not include any public relations efforts. The Champlain Water District *Water Quality Report 2012* included a reference to RSEP for stormwater mitigation information.

### 2. Total Paid Media Impressions, 2012 (Spring and Fall campaigns)

The 2012-2013 paid media budget was \$31,000 with \$29,766 expended, the same as the prior year. The same media strategies of increased online sponsorship in addition to commercial advertising were used with increased frequency through online sponsorships. This year's paid media schedule resulted in an increase of 17% in gross impressions, as delineated below:

Print: 1,325,832\*  
 Broadcast TV: 90,840 (*Nielsen households using television, Chittenden County, program ratings*)  
 Cable TV: 77,220 (*Nielsen program ratings by cable market penetration*)  
 Radio: 383,912 (*based on Arbitron ratings of adult listeners in Chittenden County, M-F 6a – 7p*)  
 Online: 234,000 (*based on circulation reported by media outlet*)  
**Total gross impressions: 2,111,804**

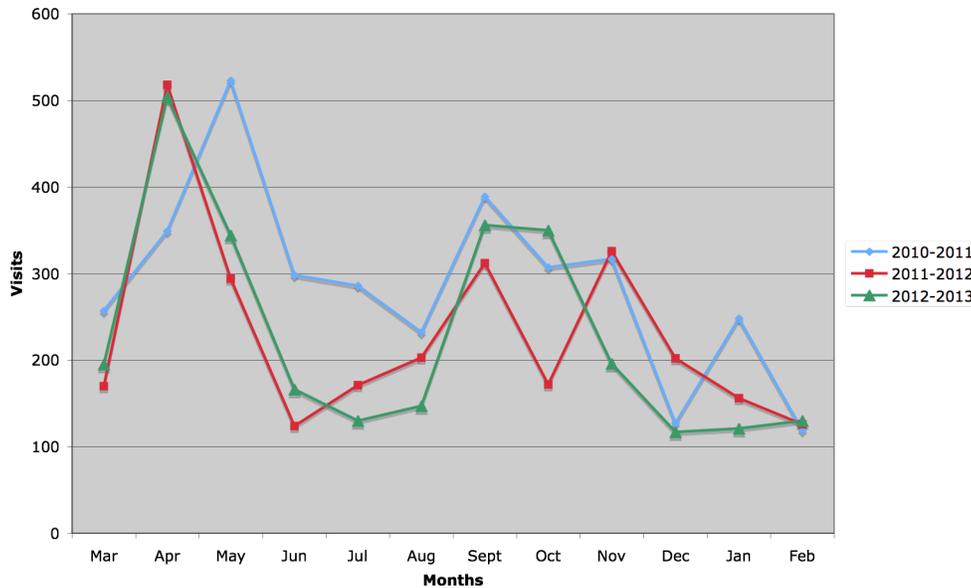
*\*Impressions are based on circulation as reported by outlet and an average readership of 2.34 per issue for community newspapers. An impression is a measure of the number of times an ad is displayed*

### 3. Website

Below is the website visitor information for 2012-2013, as compared to the three most recent preceding years. The program year had 2,756 visits, about the same number of visits as 2011-2012; ~~however, page views per visit and time on site increased.~~ Website traffic increases/spikes are in conjunction with paid media campaigns.

### Smartwaterways.org Website Visits

3-Year Comparison



NOTE: Data from Google Analytics for [www.smartwaterways.org](http://www.smartwaterways.org).

## MCM #2

## Chittenden County Stream Team

## Summary of Activities: January-December 2012

## Prepared by Winooski Natural Resources Conservation District

In the fall of 2009, the MS4 communities began to explore collaborative approach to fulfilling their Minimum Control Measure #2 permit requirement. At the request of these MS4s, the Chittenden County Regional Planning Commission (CCRPC) applied for and received two grants totaling \$22,500. Using these grants, CCRPC assisted the MS4s in developing a regional pilot project called the Chittenden County Stream Team (CCST). In its pilot year, CCST created a logo, launched a website and Facebook page, surveyed local residents, hosted a number of workshops, and completed a variety of local projects. The success of the pilot project lead to the formal adoption of the CCST program in 2011 by eleven of the MS4 communities including Burlington, South Burlington, Williston, Winooski, Shelburne, Milton, Essex, Essex Junction, the University of Vermont, VTrans and the Burlington Airport. The program was put out to bid and awarded to the Winooski Natural Resources Conservation District (WNRCD), a regional entity focused on natural resource protection and management. Under the guidance of the participating MS4s, the WNRCD completed a second successful year in fulfilling MCM2 requirement.

In 2012, the CCST template evolved to focus activities on three target towns per year. This year, they included Shelburne, Winooski, and Milton. A targeted approach aims to strengthen relationships in select areas and inspire greater involvement and capacity by volunteers. Similarly, we focused volunteer opportunities on four main categories in order to increase quality. They include: stream clean ups, Adopt-a-Rain Garden programming, water quality monitoring, and flow monitoring. Numbers of participants in activities were low in two of the targeted towns for 2012, Milton and Shelburne, though their participation in outreach was high. The time spent in 2012 doing much-needed outreach and cultivating community connections is paying off for the planning period of 2013 as we have already heard from a number of contacts in both Milton and Shelburne about an interest in partnering on stream clean-ups, water quality monitoring and rain garden installations. Hence, we believe that town focus may be best achieved over a two-year rolling basis with the first year dedicated to general outreach and building connections and the second year allowing time to implement identified projects with a stronger volunteer base. Using this model, CCST would move into to hands-on project phase with Milton and Shelburne in 2013 and increase outreach and community connections in Essex, Essex Junction and Williston in preparation for on-the-ground project implementation in those towns in 2014.

This report summarizes CCST activities in the 2012 calendar year. Demographic data about participant numbers from each town is presented in tabular form following the narrative. It is important to note that recorded numbers of participants refer to those who chose to sign up for our mailing list and give identifying information. In many cases, CCST events involved greater numbers of participants that could not be tracked. Methods to increase greater participant tracking will be employed in 2013 and will include proven methods such as gift incentives and mapping exercises where event participants who do not wish to sign up for a mailing list can identify their “watershed address” on a large map with stickers.

### **Social Media**

**Facebook** – Facebook is just one of the tools that CCST uses to disseminate information to the public about workshops, events, and projects. It is updated on a regular basis and continues to grow at a steady pace. During the latter half of 2012, the number of ‘likes’ received on the CCST Facebook page grew to 66, a 29% increase from 2011. The most represented group of followers is women between the ages of 35-44. As indicated in the attached summary table, the greatest percentage of these likes came from Burlington residents.

**CCST Website** –After a redesign in 2011, the website was used extensively in 2012 as a means to communicate with the public about general CCST information, impaired watershed locations, upcoming events and workshops, volunteer opportunities, and helpful resources. Of particular note in 2012 was the use of the website for sharing citizen-gathered water quality data – an important method for continued community involvement. Similar to the Facebook page, the website is updated on a regular basis. In total, there were 802 website visits from 557 unique visitors with an average amount of time spent on the site at 3 minutes 28 seconds. People viewed an average of 3.75 pages on each visit with a spike in overall visits following events and workshops. In the summer months of June, July and August the site received 186 views with 109 (58.6%) of them coming from new visitors.

Because we began gathering this data in December of 2011, we cannot compare this year’s web traffic with a previous year. However, it is notable that the total number of visitors to the site in December 2011 was just 15, compared to 45 in December 2012, a three-fold increase.

**E-News** – Quarterly email newsletters to our growing mailing list is another way by which CCST connects with the public. Emails include regional news, information about upcoming events and volunteer opportunities, and tips and resources. In 2012 the mailing list increased from 170 to 244 individuals. CCST E-News open rate is high 40-45%. The typical open rate for similar industries is between 20-25% according to research completed by Mail chimp.

**Organizational Partnerships** – One stated goal of CCST is to partner with other community organizations in order to broaden and strengthen our community ties. Some strong partnerships were forged this year, including a collaboration with the Winooski School District and the Department of Corrections who have agreed to take a leadership role in rain garden maintenance near their facilities. A local landscaper has agreed to donate plants when available to our rain garden efforts. In 2012 alone, Ann Pearce provided CCST with dozens of iris, lobelia and native grasses. Additionally, the Lake Champlain Land Trust and Lake Champlain Sea Grant pledged their support in on-the-ground projects with CCST in the form of staff and volunteer time and planning.

## **Projects**

**Chamberlin School Rain Garden II** – After a successful rain garden installation at the Chamberlin School in South Burlington in 2011, fourth grade teacher Chris Provost was keen to install another one with his incoming class. In September, over 40 South Burlington fourth graders, four volunteers and two teachers removed soil from a space adjacent to the school that receives roof runoff. Then the students filled the area in with more sponge-like sand, compost and topsoil before carefully planting over 50 donated rain garden plants into a 150 square foot garden space. With this garden addition, all runoff from the school’s front most roof area is captured onsite rather than flowing into the parking lot and nearby storm drains. The gardens will continue to serve as an educational tool for the school in future years as we prepare to install educational signage on site. A story about this project was included in South Burlington’s Town Newspaper, “The Other Paper.” (Article attached).

**Landry Park Rain Garden Cleanup** - Winooski’s Landry Park had a three-teired roadside rain garden installed by UVM’s Sea Grant in 2008. Since then the garden has fallen into disrepair with significant weed growth, dying trees and overgrown shrubs. This garden is on the CCST’s list of public rain gardens looking for adopters. To engage with local residents and in order to give the garden an initial boost prior to adoption, CCST coordinated with three Winooski Middle and High School classes and local residents to prune, weed, clean mulch and replant the garden in September. The clean up was successful and included over 60 volunteers on two work days. A local gardener donated iris to replace other perennials that failed to thrive in the tough conditions. The garden has since been adopted by a local high school teacher and his students and will be maintained in the coming seasons by those young stewards.

**Farrel Street Rain Garden Cleanup**- A well-placed infiltration garden buffers the stormwater-impaired Potash Brook from the Regional Correctional Facility’s parking area in South Burlington. The garden was damaged during some

construction at the facility during the 2011 winter months. CCST stepped in to coordinate a volunteer work day to redesign the garden, weed, plant with new stock and mulch. The successful event culminated in a beautified and functional rain garden. Since then, CCST has been in conversations with the work crew leaders at the Correctional Facility who have agreed to donate time to maintain the garden in the 2013 season.

**Water Quality Monitoring-** The Chittenden County Stream Team recruited five volunteers to collect biweekly water quality samples at eleven sites on Centennial, Englesby, Indian, Morehouse, Muddy and Potash Brooks during the summer of 2012. These streams suffer from sedimentation, excessive nutrient loads, high temperatures, bacteria, and other urban pollutants. A total of five samples were collected at each site during the season and were analyzed for turbidity, total phosphorous, total nitrogen, and chloride. The CCST also sampled for total suspended solids (TSS), total phosphorous, total nitrogen, and chloride at five of these sites during a rain event on 8/12/12. A complete list of the specific sampling sites as well as testing results can be found at [ccstreamteam.org](http://ccstreamteam.org).

**Salmon Hole Cleanup** – CCST organized a cleanup of Salmon Hole in Winooski/Burlington on May 5th in conjunction with WVPD. This event was attended by 9 volunteers, including Vermont’s Attorney General, Bill Sorrel.

**Longmeadow Flow Monitoring** - After a season of difficulty with weir fastening and barometric pressure logger operation, flow monitoring finally began in a storm drain in the Shelburne Longmeadow Drive neighborhood that drains to the stormwater impaired Munroe Brook. Local volunteers are gathering barometric pressure and level data biweekly and monitoring precipitation with a rain gauge at the site. The data gathered from this site over the next year will provide us with baseline information about flow from this neighborhood’s impervious surfaces to the impaired waterway and as residents install low impact development practices, we should be able to track the impact on runoff volume in real time.

**Adopt-a-Rain Garden-** In 2012, CCST finalized the adoption of 8 public rain gardens out of a total of 9. A combination of targeted event-driven outreach in areas with gardens in need in addition to web-based and event tabling to share information about the program aided in the successful adoption of so many gardens. Volunteers are supported with access to materials and plants as well as weed and trash disposal.

## **Outreach**

**Ice Cream Social Kickoff** – On April 19<sup>th</sup> in Winooski, CCST hosted an ice cream social kickoff event. Over 50 people stopped by for ice cream and were given information about stormwater and ways to get involved in the local community. Arcana tabled the event, sharing tips on how to plant a rain garden and where to purchase appropriate species.

**Burlington Kids Day** – In May we tabled this event where dozens of children took part in our moving water game and five residents signed up for our newsletter. One Burlington resident reached at this event subsequently volunteered with a rain garden cleanup activity at Farrel St. and became a rain garden adopter in his neighborhood at Callahan Park.

**Friends of the Hort Farm Plant Sale** – This well-attended event introduced us to the chair of the Friends of the South Burlington Library, six area residents who signed up for the newsletter and about a dozen others who we shared information with. Conversations with the Board Chair of the South Burlington Library initiated a large rain garden project that is currently underway to absorb parking area runoff.

**South Burlington Farmers Market** – CCST tabled this weekly market on two occasions, June 17<sup>th</sup> and August 5<sup>th</sup>. In all, nine people signed up for our newsletter and we offered a group of residents suggestions for managing stormwater in their Burlington neighborhood that drains directly to Lake Champlain.

**Milton Youth Activities Fair** – CCST tabled this annual event on September 11<sup>th</sup>. We shared information with Milton residents and gathered suggestions about where to focus a stream cleanup or rain garden installation in the town. Thirty people stopped by the booth and fourteen people signed up for the mailing list.

**Burlington Rain Garden Workshop-** In September, CCST invited local residents to learn about rain gardens – and help clean one up – at Burlington’s Lake Champlain Waterfront. This event attracted 10 people and included several UVM students, encouraged by their ecological landscape design professor to attend. Workshop attendees went home with information on residential-scale low impact development practices and where to access materials to get a project started.

## Activities Summary

Outreach Activities Participation											
Activity	Location	Participant-Residents/Town									Total
		Burlington	South Burlington	Essex	Essex Jct.	Milton	Shelburne	Williston	Winooski	Other/Unknown	
Facebook ('likes')	N/A	29	4	0	1	0	1	3	3	25	66
E-News Mailing List	N/A	42	23	8	12	14	3	14	22	108	246
Website Visits	N/A	294	22	24	0	5	2	13	27	415	802
Ice Cream Social Kickoff	Winooski	3	5	1	1		0	2	16	6	34
Kids Day	Burlington	25	0	0	0	0	0	0	0	2	27
Friends of the Hort Farm Plant Sale	S. Burlington	1	3	1	1	0	0	0	0	0	6
S. Burlington Farmers Market	S. Burlington	0	4	1	0	0	0	0	0	4	9
Milton Youth Activities Fair	Milton	0	1	0	0	27	0	0	0	2	30
Rain Garden Workshop	Burlington	6	2	1	0	0	0	0	1	0	10
<b>Total</b>		<b>400</b>	<b>64</b>	<b>36</b>	<b>15</b>	<b>46</b>	<b>6</b>	<b>32</b>	<b>69</b>	<b>562</b>	<b>1230</b>

Hands-on Projects Participation											
Event	Location	Participant-Residents/Town									Total
		Burlington	South Burlington	Essex	Essex Jct.	Milton	Shelburne	Williston	Winooski	Other/Unknown	
Salmon Hole Clean Up	Winooski	7	0	0	1	0	0	1	0	0	9
Chamberlin School Rain Garden II	S. Burlington	0	46	0	0	0	0	0	0	0	46
Landry Park Rain Garden Clean Up	Winooski	2	2	0	0	0	0	0	61	6	71
Farrel St. Rain Garden Clean Up	S. Burlington	4	0	0	0	0	0	0	0	0	4
Water Quality Monitoring/ Training	Burlington, S. Burlington, Winooski, Williston, Essex, Essex Jct.	3	1	0	0	0	0	0	0	1	5
Longmeadow Flow Monitoring	Shelburne	0	0	0	0	0	2	0	0	0	2
Adopt-a-Rain Garden	Burlington, S. Burlington, Winooski, Williston, Essex Junction	3	0	0	0	0	0	7	6	0	16
<b>Total</b>		<b>19</b>	<b>49</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>8</b>	<b>67</b>	<b>7</b>	<b>153</b>

\*Note: These numbers reflect participants who chose to sign up for our mailing list and give identifying information. Many of these events reached greater numbers of untracked participants.

\*\*Hands-on projects for Milton and Shelburne are planned for spring 2013.

## [“The Other Paper” front page article about Chamberlin Rain Garden](#)



### Students Link Learning to Real-World Science

[Home](#) » [Education](#) » [Students Link Learning to Real-World Science](#)

Thursday September 13, 2012

Share

Like 2

On a steamy, summer-like Thursday afternoon, 4th grade students in Chris Provost's class were busy putting textbook science concepts into practice outside their own school. The students energetically and happily took turns hauling wheelbarrows full of soil from a nearby pile and depositing it into what will become the school's second rain garden. The process of developing the garden ties directly into what they are learning about erosion in science class.

According to Rebecca Tharp, Water Resources Manager at the Winooski Natural Resources Conservation District, "The Chamberlin Rain Garden project is funded by the Chittenden County Stream Team ([ccstreamteam.org](http://ccstreamteam.org)) and Let it Rain ([uvm.edu/sea/grant/let-it-rain](http://uvm.edu/sea/grant/let-it-rain)). The project began last fall (2011) with a S. Burlington school teacher inspired to link the classroom learning of his 4th graders to real-world science and community service in action. Provost noticed that the water that pours off of the roof at the entrance to the school was pouring onto the sidewalk and onto the parking lot where it picked up speed, volume and pollutants as it raced toward the storm drain. Runoff from impervious surfaces is a major water quality concern in Vermont and contributes to poor water quality, stream impairment, phosphorus loading in Lake Champlain and stress on fisheries. Reducing the volume of that water is as easy as encouraging it to infiltrate close to where it lands. In the case of Chamberlin, that is happening with the installation of rain gardens at the base of their downspouts where permeable soils and plants inhabit a landscape depression. This natural holding area allows water to slowly percolate into the soil where pollutants are filtered out and pathogens are removed. Even better, that water that would be a nuisance and a threat becomes a resource as it recharges ground water and contributes to consistent and slow release of a cleaner water source to our waterways."

After the first rain garden was installed last fall the water no longer pooled or ran into the walking and parking areas and to the storm drain. Instead, that runoff goes directly to the garden where it soaks in and contributes to a beautiful landscaping feature near the

school's entrance. The positive impact of the first rain garden inspired Provost to implement a second phase to the project where there is another downspout and more land that connects to the existing garden. He worked steadily beside his students along with resident and Chamberlin parent Bern Scarp, a master gardener from UVM who was volunteering his time along with Ms. Tharp. Many plants have been donated and will become a lasting part of this garden. Ms. Tharp said Provost is, "excited about continuing the effort and seeking ways to impact water quality on the school's campus and beyond—with his students as perennial helpers and learners."

The compost, gravel and soil for this project were donated by Let It Rain. South Burlington Department of Public Works donated the trucks for use.

Individuals interested in becoming involved in some of the storm water projects happening in Chittenden County can visit [costreamteam.org](http://costreamteam.org). Keen to try out low impact development (LID) strategies on your own property? The Let It Rain storm water program is offering financial incentives for property owners who install rain gardens, rain barrels, dry wells, cisterns, permeable pavers, green roofs and other water storing, infiltrating or conveyance methods. To learn more, visit [uvm.edu/sea/grant/let-it-rain](http://uvm.edu/sea/grant/let-it-rain). The Winooski Natural Resource Conservation District manages all of these efforts and designed a manual about how to place, design and build your own rain garden. A PDF of that publication can be found at <http://www.vacd.org/winooski/> and by clicking on the "rain gardens" link to the left.

SOURCE: Corey Burdick, Correspondent