

## PROJECT BRIEF : Evaluating the Effects of Rain Gardens in a Vermont Community

### Project Location

St. Albans, Vermont

### Date Completed

January 2014

### Project Owner

Vermont Agency of Natural Resources

### Point of Contact/Reference

Jim Pease

Vermont Agency of Natural Resources

(802) 490-6116

Jim.Pease@state.vt.us

### Stone Project ID#

092187-W



*Manhole on Rugg Street in which flow monitoring equipment was deployed, St. Albans, VT.*

### Description:

Stone supported the Vermont Agency of Natural Resources Ecosystem Restoration Program, in partnership with the Lake Champlain Sea Grant and the City of St. Albans, in a Green Streets project to implement infiltration-based stormwater retrofits within the City. Areas targeted for rain garden installation include the watersheds of Rugg Brook and Stevens Brook, streams that have been designated as impaired by excessive stormwater runoff.

The Green Streets project was well received by the residents of St. Albans; however, no rigorous effort had been made to quantify the effectiveness of the rain gardens. To demonstrate whether rain gardens mitigate stormwater runoff, a paired watershed study of two residential streets was initiated.

Stone's work involved developing a monitoring plan and procedures; specifying, installing, and maintaining monitoring equipment; and analyzing flow and water quality data. In 2010 and 2011, continuous flow monitoring was performed within stormwater manholes on Rugg and Ferris Streets. An electronic tipping bucket rain gauge was used to measure rainfall. Flows in the Ferris Street and Rugg Street storm sewers were monitored for a sufficient number of events to establish a characteristic, statistical relationship between their hydrologic responses.

In August 2011, the Lake Champlain Sea Grant constructed five rain gardens in the municipal right-of-way on either side of Rugg Street. Problems related to siting, design, and construction of the rain gardens delayed post-construction flow monitoring, and four of the rain gardens were reconstructed in September 2012. Post-construction flow monitoring was performed in 2013 to document the hydrologic effect of the Rugg Street rain gardens. Post-construction monitoring was needed in both the Rugg Street and Ferris Street stormwater lines to evaluate how the hydrologic response of Rugg Street changed relative to Ferris Street, which served as the control watershed.

The installation of rain gardens in the Rugg Street right-of-way significantly reduced stormwater flows entering the closed drainage system during moderate and large storm events. By extension, we demonstrated that rain gardens have the potential to reduce the frequency and magnitude of high stream flow events. Over time, this improvement in the hydrologic regime should improve conditions necessary to support aquatic life in stormwater-impaired streams.

#### Relevance to this Contract

- ✓ 1-3 Flow + Rainfall Gaging
- ✓ 1-4 Discharge Monitoring



**STONE ENVIRONMENTAL INC**

535 Stone Cutters Way  
Montpelier, Vermont  
05602 USA

Phone / 802.229.4541  
Fax / 802.229.5417  
Web Site / [www.stone-env.com](http://www.stone-env.com)