



Green Streets-Green Jobs Grant Program Final Report Form



www.chesapeakebaytrust.org / 410-974-2941

To complete the final report for your grant, follow the format below. Failure to submit final reports will affect your organization's ability to receive future grants from the Trust and other funding partners.

1. Grantee Information

Organization Name: **Town of Ashland, Virginia**
Project Leader: **Ingrid Stenbjorn – Town Engineer**
Grant Number: **11412**

2. Summary of the Project

Describe the project and results achieved. Feel free to attach photos, digital images, newsletter articles, or press clippings to supplement your written description.

When the Town of Ashland needed to upgrade and repair its municipal parking lot, the Town Council and staff decided to "Go Green" and build a new parking lot that not only looks great, but also provides runoff reduction and promotes water quality. This parking lot renovation was then designed and built by the Town in approximately six months.

Project Benefits

The parking lot includes permeable pavement and bioretention treatment in series. Runoff comes from approximately 1-acre of impervious watershed, made up mostly of rooftops and pavement. Runoff drains into the voids of the permeable interlocking concrete pavers (PICP), down through 18-inches of open-graded stone, and infiltrates into the ground below. Any runoff that cannot infiltrate drains into the bioretention facility for secondary treatment. The bioretention facility uses native vegetation and specially designed soils (high flow media) to convey runoff through the root zone and into a 6" sump below the filter media. Any remaining runoff then drains through an upturned elbow pipe, and into the storm drains.

Based on engineering calculations, the peak rate of runoff from a 10-year storm is reduced by 96%. Smaller storm events have zero runoff. This provides the Town with a parking lot that protects downstream drainage systems and waterways from the affects of urbanization, while still providing an attractive and functional parking lot for the Town's businesses, residents and visitors to enjoy.

Visiting During a Rainstorm?

If you want to see our stormwater treatment in action, you should visit during a rainstorm. You can first observe the runoff draining onto the parking lot from the rooftops and downspouts along one side of the parking lot. It disappears underground. The runoff then drains through the stone and bioretention areas, to a storm drain pipe inside a grate inlet in the center of the parking lot. Based on initial results, there is typically no runoff coming from the discharge pipe whereas untreated runoff from the larger pipes inside the grate inlet can be seen clearly. Take a look!

More Details

For more details about this "green" parking lot, including this fact sheet and a video showing the construction work can be found by visiting our website at www.town.ashland.va.us.

DISCLAIMER: By submitting photos and videos in your final report, you are acknowledging ownership and copyright of the photos and videos submitted. The copyright will remain with the photographer; however, the Trust reserves the right to publish all items in publications, websites, advertising and promotional materials. You also confirm that you have written consent from all subjects in the photos/video submitted including if any subjects are minors under the age of eighteen.



In addition, please fill out only those metrics relevant to your project in the following table:

Project Participants	#	Restoration Outcomes (cont'd)	#	Outreach Outcomes	#
Estimated number of volunteers:		Sq. ft. of bay grasses (SAV) planted:		# of publications (print, web, other) produced:	1
Estimated number of people of color		Sq. ft. of oyster reef restored:		# of copies of print publications produced	200
Estimated number of students:		# of trees planted:	7	# web hits on online publications expected	100
Estimated number of students of color		# of native plants planted:	77	# of presentations/workshops:	2
Estimated number of teachers:		# of rain barrels installed/distributed:		# of attendees at presentations:	52
Estimated number of people of color		# of fish to be raised and/or released:		Pounds of trash/debris removed:	
Restoration Outcomes		# of bay grasses (SAV) planted:		# of storm drains stenciled:	
Sq. ft. of streamside forest buffers planted:		# of oysters to be raised and/or released:		# media hits (e.g., newspaper articles, TV and radio stories, etc.)	4
Linear ft of bank stabilization:		# of wildlife habitat structures:		<u>Other:</u> Ribbon Cutting Attendees	44
Sq. ft. of rain garden or bioretention created:	270	Sq. ft. of invasive species removed:		<u>Other:</u> Sq. ft. of Permeable Pavement	3,300
Sq. ft. of wetlands enhanced/ restored:		Linear feet of living shoreline created:			

3. Project Evaluation and Lessons learned

Provide a written evaluation of the project. Describe lessons learned; challenges or potential roadblocks to future progress. What were your greatest successes and the biggest challenges? What advice would you give someone considering a similar project?

This project's greatest success is found in the ability to see an attractive and functional permeable pavement and bioretention solution, in series. It is providing a 96% reduction in runoff for a 10-year storm event. This project also has demonstrated three significant challenges for future progress and research by others:

1. Once the old parking lot was removed the underlying sub-grade was very poor soils, with very low infiltration capabilities. It was decided to add a geo-grid to help support the traffic loadings without undercutting the site, reducing field changes and delays during construction.
2. The contractor did not compact the open graded stone in 6" lifts, and the conditions of the loose stone made it almost impossible to drive a loaded dump truck across the site. Several times, chains were needed to pull trucks through the loose stone. A more detailed specification on the compaction requirements is needed in the future.
3. Even with some donated materials that were secured during construction, the overall cost of the project was \$220,000 exceeding our budget. This cost of more than \$15 per square foot could be cost prohibitive to future project possibilities when compared with more traditional methods of stormwater management and pavement repairs, in combination.

4. Community Involvement and Outreach Activities

Describe any public involvement in the project, including the specific roles of volunteers in project activities. Also, describe any outreach or educational activities (e.g. training, brochures, press releases, or public events) related to the project that has occurred. Please list the number of volunteers involved in and the number of volunteer hours contributed to the project.

1. Two design presentations were made as part of the Ashland Main Street Association Meetings. They were utilized to inform business owners about the parking lot renovation and to build support for continuing the green design approach with the Railroad Avenue Streetscape Project which is currently funded by Town Council for design.

2. A ribbon cutting event was held to showcase the project to the local media contacts, elected officials and regulators at the state and local government level. All were encouraged to utilize the project site as a demonstration project for the region.
3. A U-Tube video link and project fact sheet were developed and posted to the Town's website, and included with an article for the Town newsletter.
4. A press release was issued by A. Morton Thomas and Associates, announcing that this project received the 2013 David Pearson Watershed Excellence Award. It was also announced in the Virginia Lakes and Watersheds Association (VLWA) newsletter. Both are attached.
5. Copies of articles from local media sources are also attached.

5. Transferability and Sustainability

How will the results of your work be used by others? Was the project or will the project be transferred to other jurisdictions/locations? How will these efforts be sustained in the future?

This project is a demonstration project for the region in utilizing permeable pavement and bioretention in series. It is designed to be a demonstration site where you can observe the runoff reduction benefits of stormwater management. The discharge pipe can be visually observed, and the information sign and fact sheets further describe the technical details of the project. There is also a U-Tube video of the construction work based on time lapse photography. Each of these educational materials is designed to encourage a wider understanding and use of these BMP technologies based on the proven success of this project.

6. Project partners

Please list your project partners and describe their roles.

A. Morton Thomas & Associates	Consultant	On-Call Engineer / Designer
Talley & Armstrong	Contractor	On-Call Construction Company
Filterra, Americast Division	Supplier	Donated Materials & Sign
Virginia DCR	State Agency	Letter of Support provided
Hanover County	Watershed Partner	Letter of Support provided
Randolph Macon College	Watershed Partner	Letter of Support provided
Center for Watershed Protection	Non-Profit	Letter of Support provided

7. Accounting of Expenditures

List all grant expenditures for the full grant period. Budget items should correspond to those listed in the approved proposal. Below is an example of the format you must follow. Receipts and/or invoices are required.

A copy of the final invoice from A. Morton Thomas and Associates (AMT) is available, showing the \$25,000 in engineering consulting services to support this project. It does not include donated time and materials associated with the project information sign, ribbon cutting event, fact sheet, other public education efforts, and grant administration. These were addressed through a combination of donated time and materials from the Town of Ashland, A. Morton Thomas and Associates, and Filterra BioPave. In addition, 100% of the construction cost for this project was paid for by the Town of Ashland, through an on-call construction contract with Talley and Armstrong. You will see that the construction costs exceeded the initial budget, and that some donated materials from Filterra BioPave were necessary to defray unanticipated costs and move this project forward to completion (see attached letter).

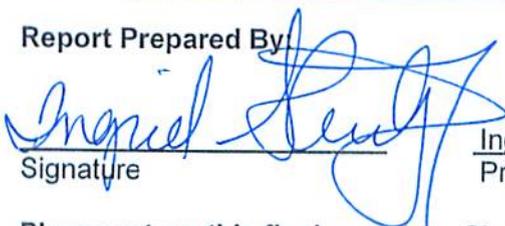
Budget item	Total cost	CBT grant funding expended	Cash match	Source of cash match	In-kind match	Source of in-kind match	Volunteer hours
Surveying – Parking Lot	\$2,380	\$2,380	\$0				
Surveying – Green Street	\$1,820	\$1,820	\$0				
Prelim. Design – Green Street	\$3,800	\$3,800	\$0				
Final Design – Parking Lot	\$17,000	\$17,000	\$0				
Public Education	\$5,500					Town Staff	
Construction Administration	\$4,200					Town Staff	
Project Fact Sheets / Reports	\$600					AMT	
Ribbon Cutting Event & Reception w/ Media Outreach	\$1,500					Town, Filterra & AMT	
Information Sign	\$2,000					Filterra	
Grant Administration	\$3,200					Town & AMT	
Construction Work	\$220,000		\$220,000	Town Funds			
SUM =	\$262,000						

Total Awarded: \$25,000 Total Spent: \$25,000

Is a refund due to CBT? No Make refund checks payable to Chesapeake Bay Trust.

8. Signature

Report Prepared By:



Signature

Ingrid Stenbjorn

Print Name

April 23, 2013

Date

Please return this final report to: Chesapeake Bay Trust, 60 West Street, Suite 405, Annapolis, MD 21401 or via email to tbaker@cbtrust.org.



Town of Ashland - Municipal Parking Lot

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Project Partners

It is with great appreciation that the Town of Ashland thanks its project partners for making this happen. The Town received a design grant from EPA Region 3, administered through the Chesapeake Bay Trust. The Town also utilized donated materials from Filterra Bioretention Systems, and contributions from many other project partners.



TOWN OF ASHLAND MUNICIPAL PARKING LOT

When the Town of Ashland needed to renovate and repair its parking lot, Town Council and staff decided to incorporate Low Impact Development (LID). The Town saved up funds for a showpiece LID Parking Lot. To stretch the funding Ashland received a grant from the Chesapeake Bay Trust for designing the LID Parking Lot. The Town's consulting engineers, A. Morton Thomas and Associates, assisted with the grant application and designed the lot. Filterra Bioretention Systems and Eagle Bay, USA (sister companies of Eagle Corporation) partnered with the Town to make this a successful project. This LID Parking Lot is one of the first of its kind, incorporating in series permeable pavement and a bioretention facility.

FEATURES

- Plantings**
Native vegetation supports pollutant removal and supports high water flow.
- Treatment Area**
0.3 acres of permeable pavers treat an impervious drainage area of more than 1-acre.
- High Flow Engineered Bioretention Media**
allows very compact size, yet provides high pollutant removal as follows:

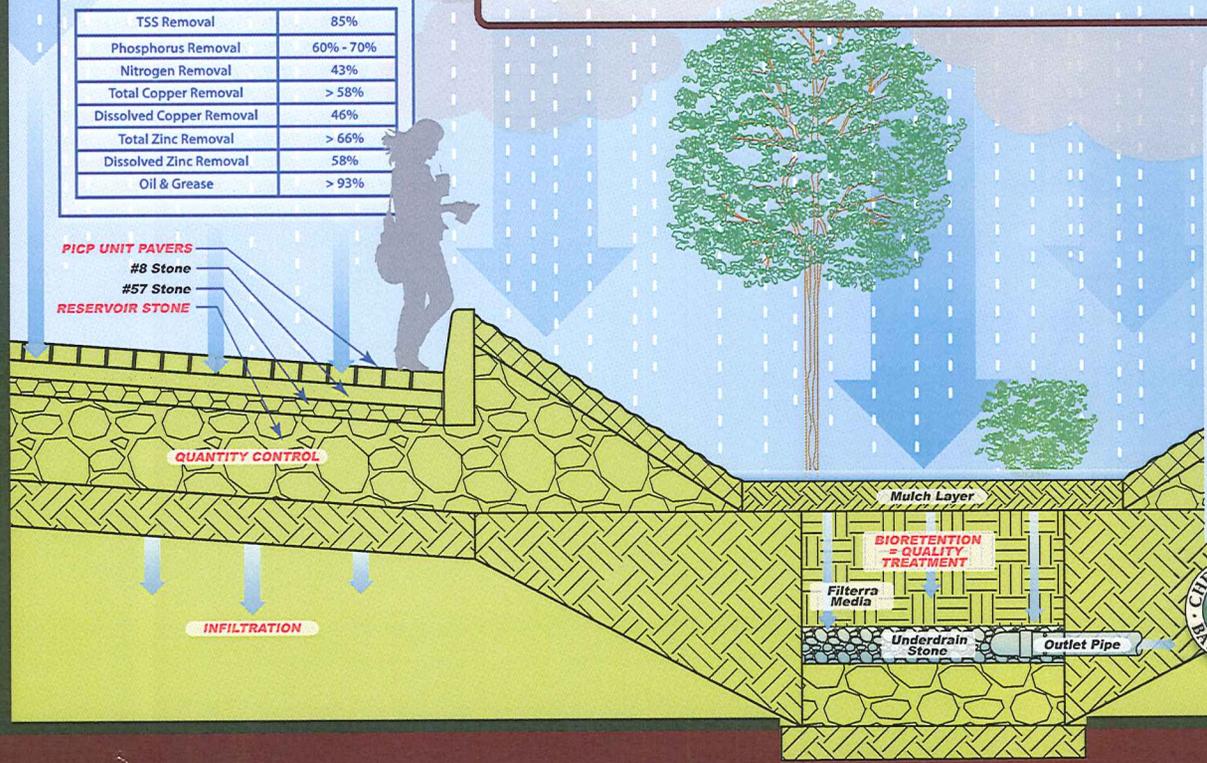
TSS Removal	85%
Phosphorus Removal	60% - 70%
Nitrogen Removal	43%
Total Copper Removal	> 58%
Dissolved Copper Removal	46%
Total Zinc Removal	> 66%
Dissolved Zinc Removal	58%
Oil & Grease	> 93%

STORMWATER MANAGEMENT IN A WEARING SURFACE: FILTERRA BIOPAVE®

Permeable Interlocking Concrete Pavers (**PICP UNIT PAVERS**) provide voids (openings) between each paver which allow stormwater runoff to infiltrate through the underlying stone section (**RESERVOIR STONE**) below. This section temporarily stores stormwater runoff (**QUANTITY CONTROL**) and allows some of the stormwater runoff to seep into the ground below (**INFILTRATION**), recharging the surrounding groundwater supplies. Any stormwater runoff from the Reservoir Stone section that does not infiltrate, is drained to the Filterra Bioretention System, which is a pre-engineered stormwater treatment device that mimics natural vegetative systems such as a forest and meadows (**BIORETENTION**). The Filterra Bioretention System removes the majority of key pollutants from the remaining stormwater runoff (**QUALITY TREATMENT**). Because the Reservoir Stone section is fully drained by the Filterra in under 24 hours even for the larger storms, the mechanical integrity of this parking lot is maintained.

GETTING A BIT MORE TECHNICAL:

The Filterra BioPave® Stormwater Management System combines stormwater detention, storage, conveyance, infiltration, and bioretention quality treatment with a wearing surface for light and heavy duty vehicular traffic. This system uses exclusive components of permeable interlocking concrete pavers (PICP), washed stone, soil stabilization grid and Filterra® Bioretention Systems to create a system that fully detains, conveys and treats up through the Q10 storm. (5.5" rain in 24 hours) Quantity management up through the 100-year storm is also provided. This system can eliminate quantity conveyance systems and offers unprecedented stormwater quality treatment within a functional wearing surface such as a parking lot.



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