

City of Harrisonburg Stormwater Advisory Committee Agenda

May 4, 2016 5:00 – 6:30 p.m.

5:00 – 5:05	1. Review and Adopt Minutes
5:05 – 5:10	2. Public Comment (limited to 3 minutes per speaker)
5:10 – 5:15	3. Review of Procedure Reminder: 5 minutes max per person during appeals
5:15 – 5:45	4. Credit Manual Updates Tree Canopy Cover for Residential Design Standards for Voluntary BMPs Appeal Process
5:45-6:00	5. Cost Share Program Update
6:00-6:15	6. Stormwater Improvement Plan Update
6:15-6:30	7. Next Steps

Rules of Procedure for Stormwater Advisory Committee meetings

Expectations for Public Comment Period

- Speaker must state their name and address
- Each speaker is limited to 3 minutes
- SWAC members and staff may respond to speaker's comments at the meeting, but are not required to do so

Expectations for Public during Meeting

- Meetings are open to the public for observation
- There is often a lot to material to cover during the meeting. Citizens attending the meeting are
 to refrain from interrupting the meeting. Citizens with questions may contact city staff or SWAC
 members after the meeting.
- At the chairperson's discretion, he or she may invite a member of the public to comment on agenda items during the meeting.

Requests for Stormwater Utility Fee Credit Appeal

- Applicant requesting appeal must submit written request to city staff 30-days prior to meeting to <u>stormwater@harrisonburgva.gov</u> or Harrisonburg Public Works, ATTN: Stormwater Utility Program, 320 East Mosby Road, Harrisonburg, VA 22801.
- Applicant is encouraged to explain in the written request why a practice should be considered
 for a stormwater utility fee credit or why an area is not considered impervious. Submission of
 photos is also encouraged.
- City staff will submit the written request, along with a staff report to the Stormwater Advisory Committee, when agenda packets are distributed. Agendas are sent about 1-week prior to the meeting.
- · At the meeting,
 - o The chair will invite city staff to present the staff report
 - The chair will invite the applicant and other members of the public to speak in favor or against the matter (5 mins max per person)
 - o The chair will invite committee members and staff to have discussion
 - The chair will ask committee members to make a motion to make a recommendation to the Director of Public Works.

Last updated: 7/29/2015



City of Harrisonburg, Virginia

STREET MAINTENANCE TRAFFIC ENGINEERING TRANSPORTATION PLANNING REFUSE/ RECYCLING CENTRAL STORES

OFFICE OF THE PUBLIC WORKS DEPARTMENT 320 EAST MOSBY ROAD HARRISONBURG, VIRGINIA 22801 (540) 434-5928

TO: Kurt Hodgen, City Manager

FROM: Jim Baker, Public Works

DATE: April 28, 2016

RE: Stormwater Utility Fee Ordinance and Credit Manuals

<u>Summary:</u> At the March 10, 2015 City Council meeting the Stormwater Utility Fee Ordinance, Credit Manuals, and Fee were adopted. Since that time, property owners have applied to receive a reduction in their fees through the Stormwater Utility Fee credit program. Interactions with property owners, City Departments, and regulatory personnel have made it necessary to update the Ordinance and Credit Manual for increased consistency with regulations and clarity for all applicants.

<u>Background:</u> The current Credit Manuals for Residential and Non-Residential properties establish specifications for the implementation of best management practices, credit amounts assigned to each of those practices, and information that the property owner needs to submit about those practices to apply for credits. The proposed changes will clarify citizen questions and regulatory guidance that staff has learned since the program's initial approval from Council. Notable changes are discussed below.

<u>Stormwater Utility Fee Ordinance:</u> Match delinquent fee interest rate to the Real Estate interest rate for ease of processing and to avoid confusion. To be presented as a separate agenda item by the City Attorney.

Non-Residential Credit Manual Updates

<u>Maintenance Agreement</u>: At the July 15, 2015 Stormwater Advisory Committee meeting, SWAC members recommend that if a property owner is seeking stormwater utility fee credits for a pre-existing BMP installed to meet development regulations, but do not have recorded maintenance agreements, then the maintenance agreement required for the stormwater utility fee application would be recorded and conveyed with the land.

<u>Calculating Pollutant Removal Spreadsheets:</u> Staff proposes the addition of three spreadsheets for applicants to use in calculating and reporting pollutant removal rates for on-site required BMPs, retrofitted BMPs, and voluntary BMPs. These spreadsheets will be used by staff in MS4 permit reports to VA Department of Environmental Quality.

Residential Credit Manual Updates

<u>Tree Canopy:</u> Since implementing the Stormwater Utility Fee Program, city staff has been approached by owners of large residential lots whose properties are mostly pervious (often

The City With The Planned Juture

grass fields), and who have concentrated tree canopy cover in portions of their properties. Given the large size of their total parcel, it is difficult for them to reach the 20% tree canopy cover requirement for stormwater utility fee credits. For this reason, new criteria for residential tree canopy cover have been proposed to accommodate property owners with larger lots and was recommended by SWAC at their November 2015 meeting.

Both Residential and Non-Residential Updates

Appeals Process for Applicants: As it exists, if an applicant is not satisfied with the response of the Public Works Department regarding their credit application, they have to appeal directly to the Director of Public Works. Staff proposes that the Stormwater Advisory Committee (SWAC) act as the review team in the case of an appeal. After hearing from staff and the applicant, the SWAC would then make a recommendation to the Director of Public Works who would make the final decision within 45 days of receipt of a formal recommendation from the SWAC.

<u>Key Issues:</u> Staff believes the ordinance changes and Credit Manual updates can help clarify the Stormwater Utility Fee Program.

Environmental Impact: None.

Fiscal Impact: None.

Prior Actions: None.

Alternatives: (a) Adopt ordinance and changes recommended by staff; or

(b) Adopt ordinance and changes recommended by council; or

(c) Do not adopt ordinance at this time

<u>Community Engagement:</u> These changes were identified throughout the past year based on feedback received from property owners, engineers, staff and SWAC members.

Recommendation: The Stormwater Advisory Committee has been made aware of all of the proposed changes and will conduct a final review of the proposed changes at the May 4 meeting. Any additional recommendations provided by SWAC will be presented at the May 10 council meeting. Staff recommends the proposed changes.

Attachments: Non-Residential Credit Manual and Appendices (only Appendices with proposed

changes included)

Residential Credit Manual (No proposed changes to Appendices included)

Excerpts of SWAC Meeting Minutes

The City With The Planned Future

Review:

The initiating Department Director will place in Legistar, in sequence of transmittal, the names of each department that must initial their review in order for this item to be placed on the City Council agenda. The completion of review only addresses the readiness of the issue for Council consideration. This does not address the recommendation for approval or denial of the issue.

###

Stormwater Utility Fee Credit Manual for Residential











City of Harrisonburg, Virginia Public Works Department 320 East Mosby Road Harrisonburg, VA 22801 540-434-5928

http://www.harrisonburgva.gov/stormwater-utility
Adopted by City Council Warch 2015XXX

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This credit manual is applicable only to residential properties. Residential properties are defined as any property on which a single-family, duplex, or townhome dwelling exists and is used for noncommercial purposes. If the property is used for commercial purposes, the Stormwater Utility Fee Credit Manual for Non-Residential must be used to apply for a credit.

1 INTRODUCTION

Stormwater runoff is the rain and snowmelt that flows over the ground and into the city's storm sewer system or directly into Blacks Run and other waterways. In undeveloped areas such as grasslands and forests, the surface flow of water is slowed by vegetation allowing some of the water to seep into the ground. In urban areas, buildings, roads, parking lots, and other impervious surfaces do not allow for rain and snowmelt to soak into the ground. This results in faster flow of runoff. Stormwater runoff picks up pollutants such as oil, sediment, chemicals, and lawn fertilizers and carries them to Blacks Run and local waterways, where they harm water quality.

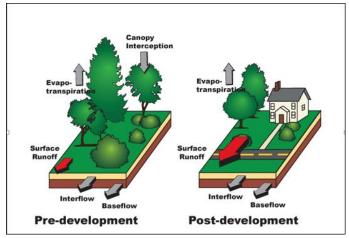
2 STORMWATER UTILITY FEE

WHAT IS A STORMWATER UTILITY FEE?

The City of Harrisonburg has adopted a stormwater utility fee to provide an adequate and stable source of funding for its stormwater program. A stormwater utility fee is a fee for service based on the amount of impervious surface area on a property. *Impervious* means surface area composed of material that significantly impedes or prevents natural infiltration of water into

soil such as roofs, driveways, walkways, etc.

This program is similar in concept to how the City distributes the cost for sanitary sewer and drinking water services. This approach has several advantages. First, it fairly distributes the cost of the city's stormwater services across all eligible properties based on the amount of impervious surface. Second, under the Code of Virginia, revenue from the stormwater utility must be placed in a



special fund that can only be used for stormwater management; therefore, revenue is established as a dedicated funding source to accomplish the goals of the City's stormwater program. Finally, the Code of Virginia requires the City to provide credits to property owners who have implemented stormwater management facilities to reduce their stormwater utility

fees. Per the City Stormwater Utility Ordinance, the stormwater utility fee shall be billed so that half the fee is billed two times per year to the property owner with the real estate tax bill.

HOW WILL THE STORMWATER UTILITY FUNDS BE USED?

The stormwater utility fee is a dedicated fund source that shall only be used for the City's stormwater program. The stormwater programs primary purpose is to provide pollution reductions by effectively managing polluted runoff. The funds collected will be used to support the following:

- Development of a city-wide Stormwater Improvement and Polluted Runoff Reduction
 Plan to identify, select, and prioritize capital projects to manage stormwater, reduce
 pollution, and protect our drinking water sources
- Design and construction of stormwater capital projects, including retrofits and community greening projects to reduce pollution and improve water quality. This includes projects on city-owned properties and partnerships (such as grants or cost-share) with private property owners.



- Coordination of pollution reduction efforts including
 - staff training on pollution prevention and good housekeeping practices for municipal operations, a pollution detection and elimination program, and a public education and outreach program.
- 1. Maintenance and operation of city-owned stormwater drainage and stormwater management facilities.

3 STORMWATER UTILITY FEE CALCULATIONS

Impervious areas such as parking lots, rooftops and driveways cannot absorb water so stormwater moves quickly over these surfaces into nearby storm sewers and streams resulting in a greater flow of water (i.e. a greater demand) on the urban drainage system. Therefore, the greater the impervious surface on your property, the greater the demand on the system.

For all properties in the city, the stormwater utility fee is based on square footage of impervious surface. For billing purposes, the fee is based on each 500 square feet of impervious area identified on each parcel and rounded to the nearest whole number.

All calculations will be performed by the City of Harrisonburg and will be available for review by the property owner.



Proposed Annual Utility Fee Calculation:

For this example, the impervious area on this parcel is 1,900 square feet (sf).

<u>Step 1</u>: Divide the parcel's impervious area in square feet by 500 sf to determine the number of billing units.

1,900 sf
$$\div$$
 500 sf = 3.8 billing units

Step 2: Round the answer in step 1 to the nearest whole number.

1,900 sf
$$\div$$
 500 sf = 3.8 \rightarrow round to 4 billing units

<u>Step 3</u>: Multiply the whole number of billing units found in step 2 with the billing unit rate.

4 INSTRUCTIONS TO APPLY FOR A CREDIT

Homeowners are encouraged to install approved stormwater Best Management Practices (BMPs) to reduce stormwater runoff volume and/or pollutant levels from their property. Homeowners with eligible existing and planned stormwater BMPs as outlined in Section 8, are

able to apply for a credit and must complete the Stormwater Utility Fee Credit Application for Residential (Appendix A) to receive credit. Refer to the instructions below.

Optional Pre-Installation Review

Property-owners installing **planned** eligible BMPs have the option to complete the Stormwater Utility Fee Credit Application for Residential prior to installation of the BMP for city review. They can check the "Pre-Installation" option at the top of the application. This is a courtesy review offered by the Public Works Department to assist homeowners. No stormwater utility fee credit will be given until the stormwater BMP is installed and a Stormwater Utility Fee Credit Application for Residential is submitted. For a courtesy review, homeowners may:

Submit the Stormwater Utility Fee Credit
 Application for Residential to the Public Works
 Department, checking the box "For Pre-Installation
 Review" in the upper left corner of the document.
 The Public Works Department will return comments
 within 45 days.

Applying for a Credit

To receive credit for **both planned and existing BMPs**, applicants <u>must complete</u> the following to apply for a credit. Applicants with existing BMPs will follow steps 2-4 below.

- 1. Install the selected stormwater BMP(s) according to the provided design standards.
- Complete the Stormwater Utility Fee Credit
 Application for Residential and Residential
 Stormwater Utility Fee Residential Maintenance
 Agreement.

- ✓ There is no fee for a credit application.
- Properties with one billing unit are not eligible to apply for a credit.
- ✓ The maximum credit a property owner can receive is 50%.
- Credits are valid for 5
 years before reapplication is
 necessary.
- ✓ Property owners must enter into a maintenance agreement with the City which includes periodic city inspections and a commitment from the property owner to maintain all components of the facility so it functions as designed.

- 3. Include pictures of each stormwater BMP. Photos must be no more than 60 days from the date of application.
- 4. Submit application and the items listed above to the address below. Applications may be submitted by mail or email.

Stormwater Utility Credit
Harrisonburg Public Works Department
320 East Mosby Road
Harrisonburg, VA 22801

Email: stormwater@harrisonburgva.gov

The Stormwater Utility Fee Credit Application for Residential and Stormwater Utility Fee Credit Manual for Residential can be found at the website below: www.harrisonburgva.gov/stormwater-utility

Upon receipt of your application, the Public Works Department will review all documentation and the applicant will be notified in writing when an application is approved or denied. If additional information is needed for review, city staff will contact the applicant.

The City shall approve or deny credit applications and reapplications within 45 days of submittal. Any credit denial shall include comments from the city within 45 days of submittal.

Appeal Process

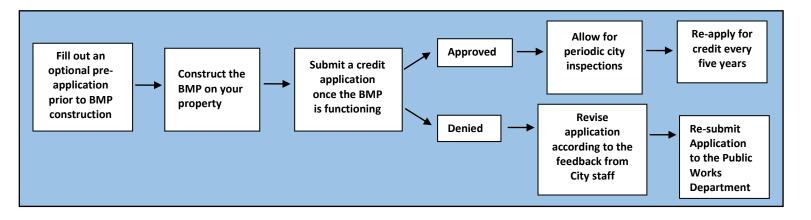
If the applicant is not satisfied with the response of the Public Works Department and/or an application is denied, an appeal may be made to the Stormwater Advisory Committee and the Director of Public Works-. The Stormwater Advisory Committee (SWAC) is comprised of five (5) members and one City Council representative serving as an ex-officio member. This Committee provides guidance, oversight and recommendations to City Council and staff in the implementation of a Stormwater Management Program. The SWAC meetings take place at the Department of Public Works Office, 320 East Mosby Road, Harrisonburg, VA 22801. The Committee meets once per quarter on the first Wednesday of February, May, August, and November unless otherwise noted.

The Applicant requesting appeal must submit a written request to city staff 30 days prior to the next scheduled SWAC meeting. The appeal can be sent to stormwater@harrisonburgva.gov or Harrisonburg Public Works, ATTN: Stormwater Utility Program, 320 East Mosby Road, Harrisonburg, VA 22801. The SWAC meeting schedule and Rules of Procedure can be found at https://www.harrisonburgva.gov/swac.

At the meeting the SWAC will make a recommendation to the Director of Public Works. The Director shall make a determination within forty-five (45) days of receipt of a formal motion

from the SWAC. If the applicant is not satisfied with the response of the Public Works Department and/or an application is denied, an appeal may be submitted to the Director of Public Works using the Stormwater Utility Fee Petition for Adjustment Form. The Director shall make a determination within forty five (45) days of receipt of a complete submittal for the petition for adjustment. The Director of Public Works' decision on a stormwater utility fee adjustment petition is a final decision from which the aggrieved party may appeal to the Rockingham County Circuit Court within 30 days of such decision.

<u>Stormwater Utility Fee Credit – Property Owner Action Plan:</u>



5 CREDIT CRITERIA

Refer to Section 8 of this manual for approved stormwater BMPs and credit reductions and Section 9 for credit calculation examples.

6 MAINTENANCE REQUIREMENTS

In order for an applicant to continue to receive a stormwater credit, each stormwater BMP installed must be maintained to ensure its continued function. The applicant is responsible for having all ongoing maintenance work completed in accordance with the appropriate Virginia DEQ Stormwater Design Specifications and/or Chesapeake Bay Program's Protocol (refer to Section 8) to keep the facilities functional and to maintain compliance with the Stormwater Utility Fee Maintenance Agreement(s). Maintenance work should be documented regularly in the attached Stormwater Utility Fee BMP Maintenance Record (Appendix F).

As described in the Stormwater Utility Fee Maintenance Agreement, city staff may periodically inspect the stormwater BMP at reasonable times and upon presentation of proper identification, whenever the City deems necessary.

If the stormwater BMP is not functioning as approved or has not been maintained, the City will notify the owner in writing outlining the deficiencies and recommended actions. If the deficiencies are not corrected by the owner within 90 days after notification is received, credit revocation will take effect immediately.

Instructions on how to reinstate credits are found in Section 7.

7 CREDIT EFFECTIVE DATE & RE-APPLICATION REQUIREMENTS

Once the stormwater BMP is installed and a credit application is approved by the Public Works Department, the credit will be applied to the stormwater utility fee for the next fiscal year following approval of the credit. For example, if a homeowner submits an application for a rain barrel on October 1, 2015 and is approved on October 30, 2015, then the credit will be applied to the fee on July 1, 2016. Be advised that application review may take up to 45 days.

<u>Credits will be valid for five (5) years from date of application approval or until transfer of ownership</u> (i.e. sale of your home to another party), whichever is first. The owner will need to re-apply for the credit every five (5) years. Proper installation and maintenance is required to continue receiving credit. To re-apply, the applicant shall submit a completed application form with Stormwater Utility Fee BMP Maintenance Records from the past five (5) years and current photographs (no more than 60 days old) of the BMP(s).

The stormwater credit applies only to the applicant. Credits do not transfer with ownership changes. A new Stormwater Utility Fee Credit Application for Residential and maintenance agreement must be submitted by the new owner in order to receive the credit. Upon transfer of ownership, the City encourages the current owners to share a copy of the application, maintenance records, and photographs with the new owner. In the event this information is not provided to the new owner, the new owner may contact the Public Works Department to obtain previous records for the BMP, if available, and apply for the credit.

To reinstate a revoked credit, if within five (5) years of the latest approved application, the applicant shall provide the Public Works Department with a copy of the Stormwater Utility Fee BMP Maintenance Records and current photos (no more than 60 days old) of the BMP(s) showing that BMP deficiencies have been corrected as recommended by city staff.

If credit has been revoked or the credit has expired (5) years after the latest approved application), the property owner must submit a new Stormwater Utility Fee Credit Application for Residential to reinstate the credit.

8 APPROVED STORMWATER BEST MANAGEMENT PRACTICES

Residential property owners may receive credit for approved practices contained in this section of the manual.

To obtain credit, property owners are required to follow the guidelines for the installation and maintenance of approved BMPs provided in this manual and as found in the <u>Chesapeake Bay Program's</u>: Homeowner Guide for a More Bay-Friendly Property.

http://chesapeakestormwater.net/2013/04/homeowner-bmpguide/

Additional information and guidance for the installation and maintenance of certain approved BMPs can be found in the following documents; however, property owners are <u>not</u> required to strictly comply with the standards and specifications found in these documents.

Chesapeake Bay Program's Urban Stormwater Protocol for Urban Stormwater Retrofits: Final CBP Approved

Expert Panel Report on Stormwater Retrofits

http://chesapeakestormwater.net/baystormwater/baywide-stormwater-policy/urbanstormwater-workgroup/retrofits/

- ✓ Selecting more than one stormwater BMP is encouraged.
- ✓ The maximum credit allowed per parcel is fifty percent (50%).
- ✓ Other stormwater management practices may be approved on a case-by-case basis.

DEQ Stormwater Design Specifications:

http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.as px

A. Roof Drain Disconnection

Downspout disconnection is the process of separating roof downspouts (gutters) from being directed to the storm sewer system and redirecting roof runoff onto pervious surfaces, most commonly a lawn. This reduces the amount of directly connected impervious area to the storm sewer system.

Two kinds of roof gutter (downspout) disconnections are allowable:

- 1 Simple disconnection, whereby gutters from rooftops are directed to pervious (grass, meadow, forest) areas, and
- 2 Gutter disconnection leading to an alternative runoff reduction practice(s) adjacent to the roof. Alternative practices can use less space than simple disconnection and can enhance runoff reduction rates. Alternative practices-: discharge into a rain garden, discharge into a drywell or French drain, and discharge into an amended filter path.



This credit is determined by the roof area that drains to each downspout. To receive a 10% credit for this practice, at least 50% of the property's roof area must be disconnected. If 100% of the property's roof area is disconnected, the property is eligible for two (2) 10% credits totaling 20%.

Design Requirements and Installation Standards for Roof Drain Disconnections

To obtain credit for this practice, property owners need to adhere to the following:

- 1. Disconnections shall empty into pervious areas, and should not empty where flow will travel onto sidewalks, driveways, or other impervious areas.
- 2. Disconnections shall not impact neighboring properties, flow onto steep slopes or flow near retaining walls.

It is also advisable that:

- Property owners consider information found in <u>DEQ Stormwater Design Specifications</u>
 <u>http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.as</u>
 <u>px</u> (Click on 2013 BMP Standards & Specifications, Specification No. 1, Rooftop Disconnection, see Simple Rooftop Disconnection)
- 2. To protect your home's foundation, it is highly recommended that disconnections be at least 10 feet from your building.

B. Rain Garden

A rain garden is a depressed landscaped area designed to capture and filter stormwater runoff. The plants and soil in a rain garden provide an easy, natural way of reducing the amount of stormwater runoff through infiltration and uptake.

To receive a 25% credit, at least 25% of the property's total on-site impervious surface area must drain to the rain garden. In order to receive a 50% credit, at least 50% of the on-site impervious surface area, including rooftops, must drain to the rain garden.

Design Requirements and Installation Standards for Rain Gardens

To obtain credit for this practice, property owners need to adhere to the following:

1. The guidelines for the installation and maintenance of approved BMPs provided in this manual and as found in the Chesapeakestormwater.net/2013/04/homeowner-bmpguide/

It is also advisable that:e

- 1.2. Overflows should be at least 10 feet from any building foundation and away from neighboring properties, sidewalks, steep slopes, and retaining walls.
- 2.3. It is highly recommended that native vegetation be planted in the rain garden. Recommended native vegetation can be found in the Chesapeake Bay Program's:

 Homeowner Guide for a More Bay-Friendly Property.



C. <u>Vegetated Filter Strip</u>

Vegetated filter strips are runoff flow paths of dense turf, meadow grasses, trees, or other vegetation with a minimum slope to treat runoff from roof downspouts.

<u>Design Requirements and Installation</u> <u>Standards for Vegetated Filter Strips</u>

To obtain credit for a vegetated filter strip, property owners should adhere to the following:



- 1. The guidelines set forth in the DEQ Stormwater Design Specifications. http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx
- 2. The filter strip area should be fully vegetated with no bare soil or mulch on embankments or within the immediate drainage area.
- 3. Fertilizers and pesticides should not be used on the filter strip or immediate drainage area.

Note: The property owner should clearly delineate in a sketch the filter strip area on the application. The sketch shall include dimensions of the filter strip and distances from landmarks on the property. This information will be shared with the City's Department of Planning and Community Development and will allow the area to be exempt from the Tall Grass and Weeds Ordinance.

Rain barrels and cisterns provide temporary storage of rain water, which reduces peak runoff volumes, reduces soil saturation, and allows for greater infiltration and evaporation of stormwater runoff.

<u>Design Requirements and Installation Standards for Rain Barrels/Cisterns</u>

To obtain credit for a rain barrel or cistern, property owners should adhere to the following:

- The guidelines for the installation and maintenance of approved BMPs provided in this manual and as found in the <u>Chesapeake Bay Program's: Homeowner Guide for a More</u> <u>Bay-Friendly Property</u>. http://chesapeakestormwater.net/2013/04/homeowner-bmp-guide/
- The rain barrel or cistern must be installed with <u>and</u> <u>comply with:</u>
 - a. A diverter or connection from a downspout;
 b. A spigot or a hose to drain the barrel;
 c.b.
 - The rain barrel or cistern must drain in no less than 24 hours and should be emptied prior to the next storm event. (Collected rainwater can be used for irrigation, although the homeowner should note that the primary purpose for the credit is to reduce the volume of stormwater runoff from draining offsite).



During winter months, it is recommended that the spigot be left open during warmer daytime hours to allow any ice to melt.

d. Overflow mechanism

е.с.

- i. All rain barrel or cistern devices should have an overflow area to route extreme flows out into the lawn or into the next treatment practice of the stormwater conveyance system (ex: overflow pipe, overflow filter path, or overflow into a rain garden).
- ii. To protect your home's foundation, it is highly recommended that overflows be at least 10 feet from your building.
- iii. Overflows shall empty into pervious areas, and should not empty where flow will travel onto sidewalks, driveways, or other impervious areas.
 - iv. Overflows shall not impact neighboring properties, flow onto steep slopes or flow near retaining walls.

3.

d. Mosquito prevention and overflow controls must be included.

It is also advisable that:

- 1. <u>During winter months, it is recommended that the spigot should be left open during warmer daytime hours to allow any ice to melt.</u>
- 1. To protect your home's foundation, it is highly recommended that overflows be at least 10 feet from your building.

E. Regional BMPs & VSMP Required BMPs Credit available with this practice: See below

Credits may be provided to individual properties served by a regional stormwater BMP that was built according to Virginia Stormwater Management Program (VSMP) requirements. In circumstances where an applicant is attempting to claim credit for a BMP that is owned by a separate entity, proof that the applicant shares in the maintenance obligations and costs must be submitted with the Stormwater Utility Fee Credit Application for Residential in order for credit to be applied. To receive credit for a regional BMP, the owner of the BMP and all property owners of the properties contributing to the stormwater BMP must complete and sign a Regional Stormwater BMP Agreement Form, which can be found in Appendix G.

CREDIT EARNED for Regional BMP for Individual Properties =

[(YY% BMP Credit) x (ZZ% of impervious area on the individual parcel treated)] x (Original Individual Parcel Stormwater Fee)

A **50%** credit will be granted for a regional stormwater BMP (as applied to the impervious surface area that is treated by the stormwater BMP). With the unique nature of regional BMPs on residential properties, it is advised that applicants contact the Public Works department to discuss further. Additional information is available in the Stormwater Utility Fee Credit Manual for Non-Residential.

VSMP Required On-Site BMPs Credits available with this practice: See below

1. VSMP Required On-Site BMPs Providing Water Quantity OR Quality Controls

If a stormwater BMP has been built as a requirement by the Virginia Stormwater Management Program (VSMP) and the City of Harrisonburg Stormwater Management Ordinance for new development or re-development (effective at the time of the initial permit registration statement for the project), and provides stormwater quantity or quality controls, then a 15% credit is allowable.

VSMP Required On-Site BMPs Providing Water Quantity AND Quality Controls

If a stormwater BMP is built, or has been built, to meet the minimum VSMP and City of Harrisonburg Stormwater Management Ordinance requirements for new development or redevelopment (effective at the time of the initial permit registration statement for the project) and provides stormwater quantity and quality controls, then a 20% credit is allowable.

If a stormwater BMP is built, or has been built, to meet VSMP and City ordinance requirements and has additional water quality pollutant removal beyond the required pollutant removal, a 25% credit is allowable. This includes retrofits to existing facilities. The 25% credit will be approved based on the following criteria:

Table 2. Pollutant Removal Overage – Credit Removal Percentages

Required Phosphorus (P) to be Removed (lbs. /yr.)	Minimum Percentage Increase of P Removal Above Required to Receive 25% Credit (%)
<u>≤5</u>	50%
5 < X ≤ 10	40%
10 < X ≤ 20	30%
Greater than 20	20%

Tree Planting Credit available with this practice: 10%

Tree planting is the practice of planting deciduous or evergreen trees in grassy areas that will grow and create a leaf canopy that intercepts rainfall and reduces runoff. Native tree species are preferred. Trees can be planted by the owner or a contractor, but species should be selected that will grow best given a variety of conditions, including the soil conditions and sun exposure at the planting site.

Tree planting credit can be attained through the planting of new trees or through existing tree canopy <u>based on the percentage of coverage shown in Table 3</u>. To receive a 10% credit, <u>minimum tree canopy coverage of 20% of the total parcel area is required.</u> A 10% credit is the maximum credit a homeowner is able to receive, even if their canopy coverage is greater than 20%.

Table 3. Criteria for Residential Tree Canopy Cover

Lot Size (acres)	% Tree Canopy Cover Requirement		
<u>2.5 or less</u>	<u>20%</u>		
<u>>2.5-5.0</u>	<u>10%</u>		
Greater than 5.0	<u>5%</u>		

Requirements and Standards for *Urban Tree Planting*

To qualify for a stormwater utility fee credit, you may add or preserve existing trees on your property. Tree canopy cover is allowable for all tree canopies contributing within property boundaries. The homeowner must consider the following:

 Tree canopy coverage for planted or existing trees will be calculated on actual cover area, as determined by review of aerial photography, or projected 10-year tree cover area.

2. If adding new trees:

- a. Plant trees recommended in Appendix B of this manual. If trees in Appendix B are not selected, the homeowner will be responsible for providing documentation of projected 10-year tree cover area.
- b. The minimum caliper and or planting size (in height) requirements for each tree provided in Appendix B must be met or documentation must be provided.
- c. Trees should be placed a minimum of 10 feet from any aboveground and underground utilities and structures. Call Miss Utility by dialing 811 a minimum of 3 days before starting your project to request utilities be marked. Care should also be taken in close proximity to septic drain fields.

- 3. Trees located within the city rights-of-way do not qualify for a utility fee credit. Tree canopy that contributes to the property owner's coverage does qualify for a utility fee credit.
- 4. Trees must be planted and preserved properly and in good, healthy condition to continue to receive credit. Canopy coverage and the health of the trees will be reevaluated every 5 years.

C

onservation Landscaping

Credit available with this practice: 10%

Conservation landscaping is the creation of mulched beds that are planted with perennial plants, shrubs and/or small trees that retain rainfall and absorb runoff from impervious areas. Native plants and organic mulch are highly recommended.

Conservation landscaping benefits the environment by improving water quality, preserving native species, and providing wildlife habitat. Conservation landscaping replaces some of the turf grass of a traditional lawn with plants that have adapted to local rainfall and soil conditions and require less water and maintenance than lawn grasses.

To receive a 10% credit, a minimum conservation landscaping coverage of 20% within the parcel is required. A 10% credit is the maximum credit a homeowner is able to receive, even if their conservation landscaping coverage is greater than 20%.

Design Requirements and Installation Standards for Conservation Landscaping

To obtain a residential credit for conservation landscaping, the following standards and requirements must be met:

- 1. The guidelines for the installation and maintenance of approved BMPs provided in this manual and as found in the <u>Chesapeake Bay Program's: Homeowner Guide for a More Bay-Friendly Property</u>. http://chesapeakestormwater.net/2013/04/homeowner-bmp-guide/
- 1.2. <u>Plants must be planted and maintained properly and in good, healthy condition</u> to continue to receive credit. Conservation landscaping coverage and the health of the plants will be re-evaluated every 5 years.

Other considerations:

- 2.3. It is highly recommended that native vegetation be planted in the conservation landscaping area. Recommended native vegetation can be found in Section 12 of this manual.
- 3.4. It is recommended to place conservation landscaping beds in a location that is lower than other parts of your lawn or your neighbor's lawn. Use any extra soil to form a small berm on the opposite side to retain water during a storm.
- 4.5. If trees are planted, they should be placed a minimum of 10 feet from any aboveground and underground utilities and structures. Call Miss Utility by dialing 811 a

- minimum of 3 days before starting your project to request utilities be marked. Care should also be taken in close proximity to septic drain fields.
- Plants must be planted and maintained properly and in good, healthy condition to continue to receive credit. Conservation landscaping coverage and the health of the plants will be re-evaluated every 5 years.
- 6. In some cases, tree canopy and conservation landscaping areas may overlap. Credits will be calculated for each separately as illustrated in Examples A, B and C shown below.

Example A:

The 10,000 square foot (sf) parcel has 2,000 sf in conservation landscaping and 2,000 sf of tree canopy. The areas <u>do not</u> overlap.

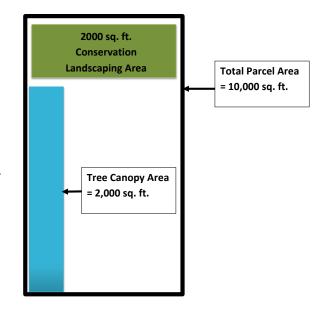
Credit Percentage Allowable:

Total Tree Canopy Area = 2,000 sf or 20% of total parcel area

Total Conservation Landscaping area = 2,000 sf or 20% of total parcel area

Total Credit Percentage Allowable = 10% (tree canopy) + 10% (conservation landscaping)

Total Credit Percentage Allowable = 20%



Example B:

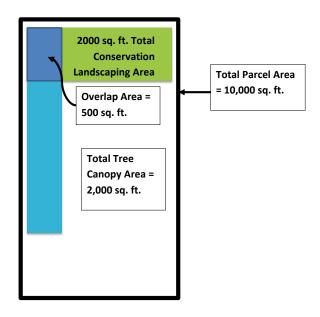
The 10,000 square foot parcel has 2,000 square feet in conservation landscaping and 2,000 square feet of tree canopy. The areas overlap with 500 square feet of overlap area.

Credit Percentage Allowable:

Total Tree Canopy Area = 2,000 sf or 20% of total parcel area

Total Conservation Landscaping Area = 2,000 sf - 500 sf = 1,500 sf

1,500 sf is less than 20% of total parcel area, therefore no credit is allowed for conservation landscaping.



Total Credit Percentage Allowable = 10% (tree canopy) + 0% (conservation landscaping)

Total Credit Percentage Allowable = 10%

Example C:

The 10,000 square foot parcel has 3,000 square feet in conservation landscaping and 2,000 square feet of tree canopy. The areas overlap with 500 square feet of overlap area.

Credit Percentage Allowable:

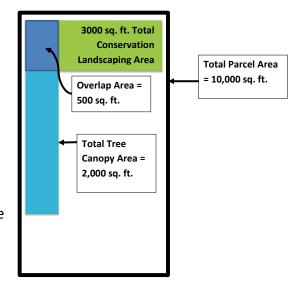
Total Tree Canopy Area = 2,000 sf or 20% of total parcel area

Total Conservation Landscaping Area = 3,000 sf - 500 sf = 2,500 sf

2,500 sf is greater than 20% of total parcel area, therefore credit is allowed for conservation landscaping.

Total Credit Percentage Allowable = 10% (tree canopy) + 10% (conservation landscaping)

Total Credit Percentage Allowable = 20%



omeowner Nutrient Management & Lawn Care Agreement

<u>Credit available with this practice: 10%</u>

Н

Applying pesticides and fertilizers is a common practice for many gardeners. Unfortunately, those lawn care chemicals often wind up washing right into local waterways. The excess nutrients from fertilizers can cause drinking water contamination, algal blooms, and fish kills. The contaminants from pesticides can result in waters that are not fishable or drinkable. A few small changes in your homeowner lawn care practices can mean a healthier lawn and less polluted runoff into local waterways.

To receive a Homeowner Nutrient Management and Lawn Care Agreement credit, the homeowner must complete and sign a Homeowner Nutrient Management Agreement, which can be found in the Appendix D of this manual.

U.I. Impervious Cover Removal, including Permeable Hardscapes and Vegetated Roofs

Credit available with this practice: See below

When impervious cover is removed, the impervious area will be recalculated for the stormwater utility fee; refer to the calculation shown in Example A in Section 9 of this manual.

Impervious cover removal consists of breaking up existing hard surfaces, removing asphalt or concrete from the site, roto-tilling of the underlying soils to relieve compaction, and planting the area with grass or other vegetation. It could also mean the installation of a permeable material to replace hard surfaces, such as asphalt driveways or concrete walks, as well as the installation of a vegetated roof



to replace standard roof material. This process requires the proper disposal or recycling of the asphalt or concrete.

<u>Permeable hardscapes</u> are designed to allow infiltration of stormwater through the surface into the soil below where water is naturally filtered and pollutants are removed. Permeable hardscapes may include paving blocks, grid pavers, permeable concrete, or permeable asphalt. Gravel is not considered permeable and is not eligible for a credit.

It is recommended that a qualified installer with knowledge of hydrology and hydraulics be consulted for applications using permeable hardscapes for driveways to ensure desired results and to support the weight of vehicles.

<u>Vegetated roofs</u> (also known as green roofs) are alternative roof surfaces that typically consist of waterproofing and drainage materials with an engineered growing media that is designed to support plant growth. Vegetated roofs capture and temporarily store stormwater runoff in the growing media before it is conveyed into the storm drain system. A portion of the captured stormwater evaporates or is taken up by plants, helping reduce runoff volumes, peak runoff rates, and pollutant loads from sites.

It is recommended that a qualified installer with knowledge of hydrology and hydraulics and roofing systems be consulted for applications using vegetated roofs to ensure desired results and to confirm the structural system is adequate to support the weight of the vegetated roof.

<u>Design Requirements and Installation Standards for Permeable Hardscapes</u>

To obtain a credit for permeable hardscapes the following standards and requirements must be met:

- 1. Installed for the purpose of runoff filtration.
- 2. For driveway installation: Stone reservoir underneath the permeable material is at least 10 inches deep at all points.
- 3. Underdrain system is constructed.
- 4. For walkway/patio installation: Stone reservoir underneath the permeable material is at least 6 inches deep at all points.
- Guidance for installation of the permeable hardscapes can be found at the DEQ Stormwater Design Specification for Permeable Pavements found here: http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx

<u>Design Requirements and Installation Standards for Vegetated Roofs</u>

To obtain a credit for vegetated roofs, it must be installed as per the DEQ Stormwater Design Specification for Vegetated Roof found here:

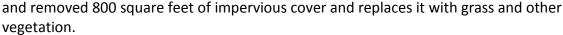
http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx.

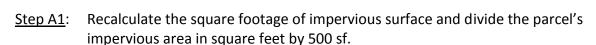
9 CREDIT CALCULATION EXAMPLES

All credit calculations will be provided by the homeowner as shown below. The calculations will be reviewed and approved by the City of Harrisonburg prior to receiving the credit. The following examples illustrate the calculation of the annual credit for a residential property.

A. Proposed Annual Utility Fee with Credit Calculation:

For this example, the impervious area on this parcel is 1,900 square feet (sf); the owner installed a rain garden





1,900 sf - 800 sf = 1,100 sf of impervious surface

Step A2: Divide the individual parcel's new impervious area in square feet by 500 sf to determine the number of billing units for the parcel

1,100 sf \div 500 sf = 2.2 billing units

Step A3: Round the answer in step A2 to the nearest whole number of billing units.

1,100 sf \div 500 sf = 2.2 \rightarrow round to 2 billing units

Step A4: Determine the base annual utility fee by multiplying the whole number of billing units found in step A3 with the billing unit rate.

2 X \$10.50 = **\$21.00** per year

<u>Step A5</u>: Calculate the credit based on the approved BMPs installed by multiplying the base annual utility fee by the credit percentage.

Rain garden credit = \$21.00 X 25% = \$5.25

Total Annual Credit = \$5.25

Step A6: Calculate the new annual fee by subtracting the credit (step A5) from the base annual utility fee (step A4).

New Annual Fee = \$21.00 - \$5.25 = \$15.75

B. Proposed Annual Utility Fee with Credit Calculation:

For this example, the impervious area on this parcel is 2,400 square feet (sf); the owner disconnected 2 downspouts (representing 50% of the 1,000 sf roof surface) and installed a rain garden capturing runoff from at least 1,200 square feet of the site's impervious surface.

<u>Step B1:</u> Divide the parcel's impervious area in square feet by 500 sf to determine the number of billing units.

 $2,400 \text{ sf} \div 500 \text{ sf} = 4.8 \text{ billing units}$

Step B2: Round the answer in step B1 to the nearest whole number of billing units.

2,500 sf \div 500 sf = 4.8 \rightarrow round to 5 billing units

Step B3: Determine the base annual utility fee by multiplying the whole number of billing units found in step B2 with the billing unit rate.

5 X \$10.50 = **\$52.50** per year

<u>Step B4</u>: Calculate the credit based on the approved BMPs installed by multiplying the base annual utility fee (step B3) by the credit percentage.

The roof drain disconnection provides a 10% credit and the rain garden provides a 50% credit. Since the maximum credit is 50%, multiply the annual utility fee (step B3) by 50%.

Total Annual Credit = \$52.50 x 50% = \$26.25

Step B5: Calculate your new annual fee by subtracting the credit (step B4) from the base annual utility fee (step B3).

New Annual Fee = \$52.50 - \$26.25 = \$26.25

C. Proposed Annual Utility Fee with Credit Calculation for a townhome with homeowner association common areas: (Note common areas will include private drives, if outside of individual parcel boundaries.)

For this example, the impervious area on this individual parcel is 1,100 square feet (sf); the total impervious area within the common areas is 25,000 sf; and there are 100 individual parcels within the subdivision/association. The owner of an individual parcel installed a rain barrel.

Step C1: Divide the individual parcel's impervious area in square feet by 500 sf to determine the number of billing units for the parcel.

1,100 sf \div 500 sf = 2.2 billing units

Step C2: Determine the individual parcel's 'share' of the common area impervious area by dividing the total common area impervious area by the number of individual parcels within the subdivision/association.

25,000 sf ÷ 100 parcels = **250 sf per parcel**

Step C3: Calculate the 'shared' billing unit per individual parcel by dividing the answer in C2 by 500 sf.

250 sf \div 500 sf = 0.5 billing units per individual parcel

Step C4: Calculate the total billing units for the subject parcel by adding the answers in step C1 and C3 and rounding the answer to the nearest whole number of billing units.

 $2.2 + 0.5 = 2.7 \rightarrow$ round to 3 billing units

Step C5: Determine the base annual utility fee by multiplying the whole number of billing units found in step C4 with the billing unit rate.

3 X \$10.50 = **\$31.50** per year

Step C6: Calculate the credit based on the approved BMPs installed by multiplying the base annual utility fee (step C5) by the credit percentage.

Rain barrel credit = \$31.50 X 20% = \$6.30

Total Annual Credit = \$6.30

Step C7: Calculate the new annual fee by subtracting the credit (step C6) from the base annual utility fee (step C5).

New Annual Fee = \$31.50 - \$6.30 = \$25.20

10 DEFINITIONS

Billing unit means five hundred (500) square feet of impervious area.

Developed property means real property that has been altered from its "natural" state by the addition of any improvements such as buildings, structures and other impervious area.

Impervious means surface area composed of material that significantly impedes or prevents natural infiltration of water into soil.

BMP or "Best Management Practice" is defined as schedules of activities, prohibitions of practices, including both structural and nonstructural practices, maintenance procedures, and other management practices used to prevent or reduce the pollution of surface waters and groundwater systems.

Residential Properties are defined as any property on which a single-family, duplex, or townhome dwelling exists and is used for noncommercial purposes.

Pervious Surface means a surface composed of material that allows water to be absorbed into the ground, reducing runoff and filtering pollutants.

Regional BMP means a BMP that accepts and treats runoff from multiple separate properties. Regional BMPs are often owned by a Property Association or other entity responsible for regular maintenance and inspections.

Stormwater Quality refers to the chemical, physical, and/or biological characteristics of surface water.

Stormwater Quantity refers to the flow rate or volume of surface runoff from a property.

Utility fee means any permit or local program fees allowed by the Code of Virginia.

11 RESOURCES

City of Harrisonburg Stormwater Management Program Public Works Department 540-434-5928

http://www.harrisonburgva.gov/stormwater-management-program

City of Harrisonburg Ordinance, Title 6, Chapter 5, Stormwater Utility <Insert link>

Cleanstream.org
Local water quality information
http://www.cleanstream.org

Department of Forestry
Information on water quality and rain gardens
Rain garden Technical Guide
http://www.dof.virginia.gov
434-977-6555

Shenandoah Valley Soil & Water Conservation District

Watershed education, low impact development information, backyard conservation, lawn and tree care tips, rain garden and rain barrel information

http://svswcd.org/

540-433-5853 x 3

Virginia Department of Environmental Quality
Watershed education, lawn care, pet waste, and land conservation information
http://www.dcr.virginia.gov
804-786-1712

Chesapeake Bay Foundation

Water Quality, lawn care tips, Bay education, rain garden, and rain barrel information http://www.cbf.org

804-648-4011

Alliance for the Chesapeake Bay
Bay education, Clean Stream projects, rain barrel and native landscaping information
http://www.allianceforthebay.org
804-775-0951

12 NATIVE PLANT REFERENCES

The information below is provided as a resource to assist property owners with selection of trees and plants on their properties.

Fairfax County, Rain Garden Design & Construction: A Northern Virginia Homeowner's Guide, http://www.fairfaxcounty.gov/nvswcd/raingarden.htm

Northern Virginia Soil & Water Conservation District, 10 Common Rain Garden Plants, http://www.novaregion.org/index.aspx?NID=977

Northern Virginia Soil & Water Conservation District, et al., Residential Low Impact Landscaping Handbook, http://www.fairfaxcounty.gov/nvswcd/raingarden.htm

Virginia Cooperative Extension, Urban Water-Quality Management: Rain Garden Plants, http://pubs.ext.vt.edu/426/426-043/426-043.html

Virginia Department of Conservation & Recreation, Native Plants for Conservation, Restoration, and Landscaping, http://www.dcr.virginia.gov/natural-heritage/nativeplants.shtml.

Virginia Department of Forestry, Rain Gardens Technical Guide, http://www.raingardensforthebays.org/wp-content/uploads/2013/04/pub-Rain-Garden-Tech-Guide 2008-05.pdf

Virginia Department of Forestry, Common Native Trees, Tree Identification Guide, http://www.dof.virginia.gov/print/edu/Common-Native-Trees.pdf

US Fish & Wildlife Service, Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed, http://www.nps.gov/plants/pubs/Chesapeake/toc.htm

Plant Invaders of the Mid-Atlantic Natural Areas, http://www.nps.gov/plants/ALIEn/pubs/midatlantic/index.htm (Non-native/invasive plants are not recommended)

APPENDICES

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APPENDIX B.	TREE CANOPY CHART
APPENDIX C.	STORMWATER UTILITY MAINTENANCE AGREEMENT
APPENDIX D.	HOMEOWNER NUTRIENT MANAGEMENT AND LAWNCARE AGREEMENT
APPENDIX E.	STORMWATER UTILITY FEE CREDIT RE-APPLICATION
APPENDIX F.	STORMWATER UTILITY FEE PETITION FOR ADJUSTMENT FORM
APPENDIX G.	STORMWATER UTILITY FEE BMP MAINTENANCE RECORD
APPENDIX H.	REGIONAL STORMWATER BMP AGREEMENT FORM

Stormwater Utility Fee Credit Manual for Non-Residential











City of Harrisonburg, Virginia Public Works Department 320 East Mosby Road Harrisonburg, VA 22801 540-434-5928

www.harrisonburgva.gov/stormwater-utility

Adopted by City Council March 2015XXX

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	RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN-

This credit manual is applicable only to non-residential properties defined as any property that does not have a single-family, duplex, or townhome dwelling and is used for multi-family residential, commercial, industrial, or other non-residential purpose.

1 INTRODUCTION

Stormwater runoff is the rain and snowmelt that flows over the ground and into the city's storm sewer system or directly into Blacks Run and other waterways. In undeveloped areas such as grasslands and forests the surface flow of water is slowed by vegetation, allowing some of the water to seep into the ground. In urban areas, buildings, roads, parking lots, and other impervious surfaces do not allow for rain and snowmelt to soak into the ground. This results in faster flow of runoff. Stormwater runoff picks up pollutants such as oil, sediment, chemicals, and lawn fertilizers and carries them to Blacks Run and local waterways where they harm water quality.

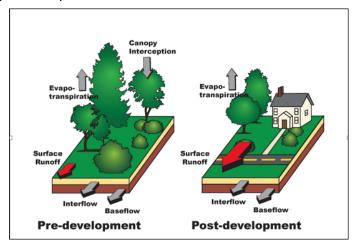
2 STORMWATER UTILITY FEE

WHAT IS A STORMWATER UTILITY FEE?

The City of Harrisonburg has adopted a stormwater utility fee to provide an adequate and stable source of funding for its stormwater program. A stormwater utility fee is a fee for service based on the amount of impervious surface area on a property. Impervious means surface area composed of material that significantly impedes or prevents natural infiltration of water into

soil such as roofs, driveways, walkways, etc.

This program is similar in concept to how the City distributes the cost for sanitary sewer and drinking water services. This approach has several advantages. First, it fairly distributes the cost of the city's stormwater services across all eligible properties based on the amount of impervious surface. Second, under the



Code of Virginia, revenue from the stormwater utility must be placed in a special fund that can only be used for stormwater management; therefore, revenue is established as a dedicated funding source to accomplish the goals of the City's stormwater program. Finally, the Code of Virginia requires the City to provide credits to property owners who have implemented

stormwater management facilities to reduce their stormwater utility fees. Per the City Stormwater Utility Ordinance, the stormwater utility fee shall be billed so that half the fee is billed two times per year to the property owner with the real estate tax bill.

HOW WILL THE STORMWATER UTILITY FEE BE USED?

The stormwater utility fee is a dedicated fund source that shall only be used for the City's stormwater program. The stormwater program's primary purpose is to provide pollution reductions by effectively managing polluted runoff. The funds collected will be used to support the following:

- Development of a city-wide Stormwater Improvement and Polluted Runoff Reduction
 Plan to identify, select, and prioritize capital projects to manage stormwater, reduce
 pollution, and protect our drinking water sources
- Design and construction of stormwater capital projects including retrofits and community greening projects to reduce pollution and improve water quality. This includes projects on city owned properties and partnerships (such as grants or cost-share) with private property owners



- 3. Coordination of pollution reduction efforts including staff training, pollution prevention and good housekeeping practices for municipal operations, pollution detection and elimination program, and public education and outreach
- 4. Maintenance and operation of city-owned stormwater drainage and stormwater management facilities

3 STORMWATER UTILITY FEE CALCULATIONS

Impervious areas such as parking lots, rooftops, and driveways cannot absorb water. Stormwater moves quickly over these surfaces into nearby storm sewers and streams resulting in a greater flow of water (i.e. a greater demand) on the urban drainage system. Therefore, the greater the impervious surface on your property, the greater the demand on the system.

For all properties in the city, the stormwater utility fee is based on square footage of impervious surface. For billing purposes, the fee is based on each 500 square feet of impervious area identified on each parcel and rounded to the nearest whole number.

All calculations will be performed by the City of Harrisonburg and will be available for review by the property owner.





For this example, the impervious area on this parcel is approximately 466,200 square feet (sf).

<u>Step 1</u>: Divide the parcel's impervious area in square feet by 500 sf to determine the number of billing units.

 $466,200 \text{ sf} \div 500 \text{ sf} = 932.4 \text{ billing units}$

Step 2: Round the answer in step 1 to the nearest whole number of billing units.

466,200 sf ÷ 500 sf = 932.4 → round to 932 billing units

<u>Step 3</u>: Multiply the whole number of billing units found in step 2 with the billing unit rate.

 $932 \times $10.50 = $9,786.00 per year$

4 INSTRUCTIONS TO APPLY FOR A CREDIT

Owners of non-residential properties are encouraged to install approved stormwater Best Management Practices (BMPs) to reduce stormwater runoff volume and/or pollutant levels from their property. Refer to Section 8 for information regarding types and optimal locations for approved BMPs. BMPs can be constructed onsite or as regional facilities and/or treat off-site impervious areas; refer to Section 5 for additional information regarding credit calculations for regional and/or off-site treatment BMPs.

There are four (43) categories of BMPscategories eligible for a credit.

A. <u>Virginia Stormwater Management Program (VSMP) Required</u> On-Site BMPs Providing Water Quantity **OR** Quality Controls

These are BMPs installed as required to comply with VSMP standards and specifications, the General VPDES Permit for Discharges of Stormwater from Construction Activities Regulations, and the City of Harrisonburg Stormwater Management Ordinance effective at the time of the initial permit registration statement for the project. This category includes BMPs installed as a part of new development or redevelopment as well as pre-existing BMPs.

B. <u>VSMP Required On-Site BMPs Providing Water Quantity **AND**</u>
<u>Quality Controls</u>

These are BMPs installed as required to comply with VSMP standards and specifications, the General VPDES Permit for Discharges of Stormwater from Construction Activities Regulations, and the City of Harrisonburg Stormwater Management Ordinance effective at the time of the initial permit registration statement for the project. This category includes BMPs installed as a part of new development or redevelopment as well as pre-existing BMPs.

C. Voluntary On Site-Water Quality BMPs

These are BMPs constructed that These stormwater BMPs were not/are not constructed as a requirement of the VSMP regulations, the General VPDES Permit for Discharges of Stormwater from Construction Activities Regulations, and/or the City of Harrisonburg Stormwater Management Ordinance.

- ✓ There is no fee for a credit application.
- ✓ Properties with one billing unit are not eligible to apply for a credit.
- ✓ The maximum credit a property owner can receive is 50%.
- Credits are valid for 5
 years before re application is
 necessary.
- ✓ Property owners must enter into a maintenance agreement with the city, which includes periodic city inspections and a commitment from the property owner to maintain all components of the facility so it functions as designed.

In order to receive a stormwater utility credit, the stormwater BMP must be installed to meet VSMP standards and specifications and/or Chesapeake Bay Program's Urban Stormwater Protocols (listed in Section 8) effective on the date of the start of construction and per the original construction plans and documents for the facility. This category includes BMPs that were built voluntarily to treat stormwater from a particular site for the purpose of improved water quality. Note that voluntarily-constructed water quantity only BMPs are not eligible as a part of thise program.

D. VPDES Industrial Permit Coverage

Credits may also be granted to property owners for holding a current Industrial Virginia Pollutant Discharge Elimination System (VPDES) permit; refer to Section 5 for additional information.

Optional Pre-Installation Review

Property owners installing new stormwater BMPs have the option to complete the Stormwater Utility Fee Credit Application for Non-Residential <u>prior</u> to installation of the BMP for city review. This is a courtesy review offered by the Public Works Department to assist property owners. No stormwater utility fee credit will be given until the stormwater BMP is installed and a Stormwater Utility Fee Credit Application for Non-Residential is submitted and approved. For a courtesy review, property owners may:

1. Submit the Stormwater Utility Fee Credit Application for Non-Residential to the Public Works Department, checking the box for "Pre-Installation Review"; the Public Works Department will return comments within 45 days.

Applying for a Credit

Following installation of the BMPs, categories A, B, and C, applicants must complete and submit the following to apply for a credit:

- 1. Stormwater Utility Fee Credit Application Form for Non-Residential
- Stormwater Utility Fee BMP Non-Residential Maintenance Agreement

For BMPs that fall under Categories A & B, the maintenance agreement must be coordinated with the City Engineer, recorded at the Rockingham County Clerk of Court's office, and copies submitted to the City Engineer's office and submitted with the Stormwater Utility Fee Credit Application for Non-Residential.

A maintenance agreement template is available at Appendix X:

http://www.harrisonburgva.gov/dcsm. If there is a pre existing maintenance agreement for the stormwater BMP, it must be on file with the Rockingham County Clerk of Court's office and submitted with the Stormwater Utility Fee Credit Application for Non-Residential.

The maintenance agreement template is available in Appendix B of this manual. A completed form needs to be included in the application, but does not need to be recorded at the Rockingham County Clerk of Court's office. For BMPs that fall under Category C, the Stormwater Utility Fee Maintenance Agreement for use with a Voluntary....see Appendix D.

- a. Refer to Section 6 for maintenance requirements.
- 3. Stormwater management calculations, original construction plans, and record drawings, as required.
- 4. Stormwater Utility Fee Credit Calculations and Pollutant Removal Calculations
- <u>5.</u> Pictures of each stormwater BMP installed. Photos must be no more than 60 days old from date of application.
- 4. Most recent inspection forms completed by a professional engineer.

6.

For VPDES Industrial Permit Coverage, applicants must complete and submit the following to apply for a credit:

- 1. Copy of Virginia DEQ General Permit Coverage Letter
- 2. Copy of Stormwater Pollution Prevention Plan (SWPPP)
- 3. Copy of latest Discharge Monitoring Report (DMR)
- ——<u>Stormwater Utility Fee Calculations</u>

4.

The property owner shall submit the application and the items listed above to the address below. Applications may be submitted by mail or email.

Stormwater Utility Credit
Harrisonburg Public Works Department
320 East Mosby Road
Harrisonburg, VA 22801

Email: stormwater@harrisonburgva.gov

The Stormwater Utility Fee Credit Application for Non-Residential and Stormwater Utility Fee Credit Manual for Residential can be found at the website below:

www.harrisonburgva.gov/stormwater-utility

Upon receipt of the application, the Public Works Department staff will review all documentation and the applicant will be notified in writing when an application is approved or denied. If additional information is needed for review, city staff will contact the applicant.

The City shall approve or deny credit applications and reapplications within 45 days of submittal. Any credit denial shall include comments from the City within 45 days of submittal.

Appeal Process

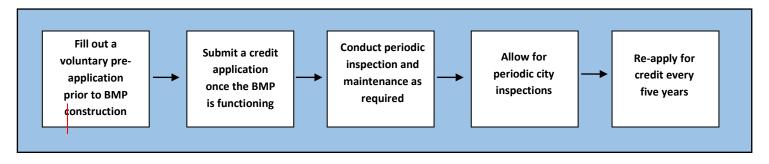
If the applicant is not satisfied with the response of the Public Works Department and/or an application is denied, an appeal may be <u>made to the Stormwater Advisory Committee and Director of Public Works-.</u> The Stormwater Advisory Committee (SWAC) is comprised of five (5) members and one City Council representative serving as an ex-officio member. This Committee provides guidance, oversight and recommendations to City Council and staff in the implementation of a Stormwater Management Program. The SWAC meetings take place at the Department of Public Works Office, 320 East Mosby Road, Harrisonburg, VA 22801. The Committee meets once per quarter on the first Wednesday of February, May, August, and November unless otherwise noted.

The Applicant requesting appeal must submit a written request to city staff 30 days prior to the next scheduled SWAC meeting. The appeal can be sent to stormwater@harrisonburgva.gov or Harrisonburg Public Works, ATTN: Stormwater Utility Program, 320 East Mosby Road, Harrisonburg, VA 22801. The SWAC meeting schedule and *Rules of Procedure*- can be found at https://www.harrisonburgva.gov/swac.

At the meeting, SWAC will make a recommendation to the Director of Public Works. submitted to the Director of Public Works using the Stormwater Utility Fee Petition for Adjustment Form. The Director shall make a determination within forty-five (45) days of the receipt of a formal motion from the SWAC. a complete submittal for the petition for adjustment. The Director of Public Works' decision on a stormwater utility fee adjustment petition is a final decision from which the aggrieved party may appeal to the Rockingham County Circuit Court within 30 days of such decision.

The credit application and manual can be found at the website below: www.harrisonburgva.gov/stormwater-utility.

<u>Table 1. Stormwater Utility Fee Credit – Property Owner Action Plan:</u>



5 CREDIT CRITERIA

The amount of credit earned for a property is determined by the number and type of stormwater BMP(s) installed and is applied to the percentage of the site's total impervious surface area that is treated by (or draining to) the stormwater BMP, not the total amount of impervious area on the site.

CREDIT EARNED = [(XX% Credit) x (XX% of impervious area treated)] x (Original Stormwater Fee)

In no case shall the total credit exceed 50% of the annual stormwater utility fee charged to the parcel owner.

DESIGN CRITERIA

Existing BMP retrofits and voluntary BMPs meeting the land disturbing criteria for the Construction General Permit (greater than 1 acre) are not required to meet the VSMP water quality criteria. The pollutant reduction should be calculated using Appendix K, L and M. Applicants are still required to obtain a Construction General Permit if thresholds are exceeded and additionally follow any stormwater and erosion and sediment control requirements.

CREDITS FOR ON-SITE STORMWATER MANAGEMENT FACILITIES

A. VSMP Required On-Site BMPs Providing Water Quantity OR Quality Controls

If a stormwater BMP has been built as a requirement by the Virginia Stormwater Management Program (VSMP) and the City of Harrisonburg Stormwater Management Ordinance for new development or re-development (effective at the time of the initial permit registration statement for the project), *and* provides stormwater quantity **or** quality controls, then a **15% credit** is allowable. The 15% credit will be approved based on the criteria outlined in Table 2.

If the applicant is applying for a Stormwater Utility Fee credit for required on-site BMPs, completeSee Appendix K entitled -On-Site Required BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern. as a part of the required application package. If the applicant is applying for a Stormwater Utility Fee credit following a BMP retrofit or a newly constructed oversized BMP, complete Appendix L entitled Retrofitted BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern. One of these two spreadsheets is required as a part of the Stormwater Utility Fee Non-Residential application package for BMP Type A and B.

If a stormwater BMP is built, or has been built, to meet VSMP and City ordinance requirements and has additional water quality pollutant removal beyond the required pollutant removal, a 25% credit is allowable. This includes retrofits to existing facilities. The 25% credit will be approved based on the criteria outlined in Table 2.

<u>Table 2. Pollutant Removal Overage – Credit Removal Percentages</u>

Required Phosphorus (P) to be Removed (lbs. /yr.)	Minimum Percentage Increase of P Removal Above Required to Receive 25% Credit (%)
<u>≤ 5</u>	<u>50%</u>
<u>5 < X ≤ 10</u>	<u>40%</u>
<u>10 < X ≤ 20</u>	<u>30%</u>
Greater than 20	<u>20%</u>

B. VSMP Required On-Site BMPs Providing Water Quantity AND Quality Controls

If a stormwater BMP is built, or has been built, to meet the minimum VSMP and City of Harrisonburg Stormwater Management Ordinance requirements for new development or re-development (effective at the time of the initial permit registration statement for the project) *and* provides stormwater quantity **and** quality controls, then a **20% credit** is allowable.

If a stormwater BMP is built, or has been built, to meet VSMP and City ordinance requirements *and* has additional water quality pollutant removal beyond the required pollutant removal, **a 25% credit** is allowable. This includes retrofits to existing facilities. The 25% credit will be approved based on the <u>criteria outlined in Table 2</u>. Removal rates must meet minimum percentage increase of TP removal to receive Stormwater Utility Fee credit as shown in Table 2.

Table 2. Pollutant Removal Overage - Credit Removal Percentages

Required Phosphorus (P) to be Removed (lbs. /yr.)	Minimum Percentage Increase of P Removal Above Required to Receive 25% Credit (%)
<u>≤5</u>	50%
5 < X ≤ 10	40%
10 < X ≤ 20	30%

Greater than 20	20%

If the applicant is applying for a Stormwater Utility Fee credit for required on-site BMPs, complete Appendix K entitled On-Site Required BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern. If the applicant is applying for a Stormwater Utility Fee credit following a BMP retrofit or a newly constructed oversized BMP, complete Appendix L entitled Retrofitted BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern. One of these two spreadsheets is required as a part of the Stormwater Utility Fee Non-Residential application package for BMP Type A and B.

C. <u>ust meet minimum percentage increase of TP removal as shown in Table 2.</u>Voluntary On-<u>Site Water Quality BMPs</u>

If an on-site stormwater-water quality BMP was installed voluntarily and *not* as a requirement of the City, VSMP, or other governmental agency, a 100% credit reduction is allowable (as applied to the impervious surface area that is treated by the stormwater BMP will be removed from the site's impervious area assessment, not to exceed 50% maximum credit for the annual stormwater utility fee charged to the parcel owner.)—To qualify for credit, voluntary BMPs installed must have water quality treatment. An installed water quantity treatment only BMP will *not* qualify for credit as a voluntary BMP.

Voluntary BMPs shall be designed and constructed in accordance with the specifications of the Virginia DEQ Stormwater Design Specifications and/or Chesapeake Bay Program's Urban Stormwater Protocols. Plans for BMPs must be approved by the City prior to construction, and an as-built certification will be required before the property's impervious area will be reduced for fee purposes. Voluntary BMPs existing prior to adoption of the Stormwater Utility that were not previously reviewed and approved under the above standards will be considered on a case by case basis.

For applicants applying for a voluntary BMP, complete Appendix M entitled Voluntarily
Installed BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants
of Concern as a part of the Stormwater Utility Fee Non-Residential application package for
BMP Type C.

DESIGN CRITERIA

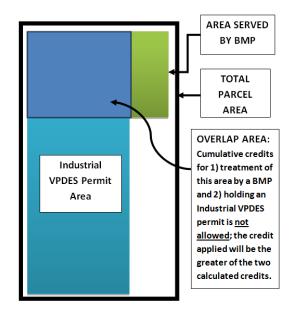
Existing BMP retrofits and voluntary BMPs meeting the land disturbing criteria for the Construction General Permit (greater than 1 acre) are not required to meet the VSMP water quality criteria. The pollutant reduction should be calculated using Appendix A, B and C.

Applicants are still required to obtain a Construction General Permit if thresholds are exceeded and additionally follow any stormwater and erosion and sediment control requirements.

D. VPDES Industrial Permit Coverage

A 20% credit reduction is allowable if a property owner has a current individual or general Industrial Virginia Pollutant Discharge Elimination System (VPDES) permit. The credit will be applied only to the area subject to the VPDES permit. The property owner must provide a copy of the VPDES permit, stormwater pollution prevention plan (SWPPP), and discharge monitoring reports (the latest submittal to DEQ in accordance with the semiannual reporting requirements) to be eligible for the credit.

If there is a BMP treating area within and/or outside the Industrial VPDES subject area and the property owner requests credit for the VPDES permit, the property owner shall not



receive credit for the impervious area treated by the BMP within VPDES area. Credit will be given to whichever credit is greater.—Appendix A, B and C. Applicants

CREDITS FOR ON-SITE SWM FACILITIES TREATING OFF-SITE IMPERVIOUS AREAS

The owner of an eligible stormwater BMP that treats an off-site impervious surface(s) may receive credit for treating the off-site impervious surface(s). For the purposes of this manual, off-site impervious surface is defined as stormwater runoff that originates outside of the subject property. The off-site impervious area must not be treated by another stormwater BMP. The off-site credit amount shall be calculated in the same manner as if the stormwater BMP was located on the on-site parcel. However, in no case shall the total credit exceed 50% of the annual stormwater utility fee charged to the parcel owner. Refer to Section 9c for an example calculation.

CREDIT EARNED for On-Site BMPs Treating Off-Site Impervious Areas = [(YY% BMP Credit) x (ZZ%)] x (Original Individual Parcel Stormwater Fee)

Where **ZZ% = % of impervious area treated by (draining to) BMP** = (on and/or off-site impervious area treated by BMP) ÷ (total on-site impervious area)

If the adjoining property owner installs an onsite BMP that treats the area previously credited to the neighboring owner, the credit for the neighboring property will be reduced accordingly.
Credits may be provided to individual properties served by a regional stormwater BMP. In circumstances where an applicant is attempting to claim credit for a BMP that is owned by a separate entity, proof that the applicant shares in the maintenance obligations and costs must be submitted with the application in order for credit to be applied. To receive credit for a regional BMP, the owner of the BMP and all property owners of the properties contributing to the stormwater BMP must complete and sign a Regional Stormwater BMP Agreement Form, which can be found in Appendix F.
CREDIT EARNED for Regional BMP for Individual Properties = [(YY% BMP Credit) x (ZZ% of impervious area on the individual parcel treated)] x (Original Individual Parcel Stormwater Fee)

Applicants may use excess nutrient credits from private development projects in exchange for stormwater utility fee credits on a case by case basis. Contact the Public Works department at 540-434-5928 to discuss. CREDITS FOR INDUSTRIAL VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM (VPDES) PERMIT

A **20% credit reduction** is allowable if a property owner has a current individual or general Industrial Virginia Pollutant Discharge Elimination System (VPDES) permit. The credit will be applied only to the area subject to the VPDES permit. The property owner must provide a copy of the VPDES permit, stormwater pollution prevention plan (SWPPP), and discharge monitoring reports (the latest submittal to DEQ in accordance with the semiannual reporting requirements) to be eligible for the credit.

If there is a BMP treating area within and/or outside the Industrial VPDES subject area and the property owner requests credit for the VPDES permit, the property owner shall not receive credit for the impervious area treated by the BMP within VPDES area. Credit will be given to whichever credit is greater.

6 MAINTENANCE REQUIREMENTS

In order for an applicant to continue to receive a stormwater credit, each stormwater BMP installed must be maintained to ensure continued function. <u>Maintenance activities are required through a BMP Maintenance Agreement</u>. <u>Types of BMP Maintenance Agreements are outlined below</u>.

The applicant is responsible for having all ongoing maintenance work completed in accordance with the appropriate Virginia DEQ Stormwater Design Specifications and/or Chesapeake Bay Program's Urban Stormwater Protocols (refer to Section 8) to ensure the facilities are functional and to maintain compliance with the Stormwater Utility Fee Non-Residential Maintenance Agreement. Maintenance work should be documented regularly in the attached Stormwater Utility Fee BMP Maintenance Record (Appendix E). (Refer to Section 4 for Stormwater Utility Fee Non-Residential Maintenance Agreement requirements).

Required On-Site BMPs and Newly Constructed BMPs

Required on-site BMPs that were designed built after 2008 should have a recorded maintenance agreement on file at the Department of Community Development and the Rockingham County Clerk of Court's office. This is an agreement that was/is required as part of the original development of the BMP and is filed and maintained outside of the Stormwater Utility Fee Program. The applicant should include a copy of this maintenance agreement as a part of their Stormwater Utility Fee Non-Residential Application package. See Appendix I entitled Credit Application Guide for Existing Non-Residential BMPs for more information.

Required On-Site Existing BMPs Designed Before 2008

Required on-site BMPs that were designed built prior to 2008 were not required at the time of construction to sign a recorded maintenance agreement. As a part of the Stormwater Utility Fee Application for Non-Residential, the applicant is required to enter into the Stormwater Management/BMP Facilities Maintenance Agreement For Pre-Existing Stormwater Management/BMP Facilities Required to Satisfy Development Regulations. This document should be signed and recorded at the Rockingham County Clerk of Court's office. See Appendix J entitled Procedures for completing the Pre-Existing Stormwater Management/BMP Facilities Maintenance Agreement and Applying for a Stormwater Utility Fee Credit for more information.

Voluntary BMPs

All voluntary BMPs are required to enter into the Stormwater Utility Fee Maintenance

Agreement For use with Voluntarily Installed Non-Residential BMPs. The applicant

should include this maintenance agreement as part of their Stormwater utility Fee NonResidential Application package.

As described in the attached maintenance agreement (Appendix B), city staff may inspect the stormwater BMP at any time.

If the stormwater BMP is not functioning as approved or has not been maintained, the City will notify the owner in writing outlining the deficiencies and recommended actions. If the deficiencies are not corrected by the owner within 90 days after notification is received, credit revocation will take effect immediately. BMPs may be subject to other penalties or fees as described in the attached maintenance agreements (Appendix B).

Instructions on how to reinstate credits are in Section 7.

7 CREDIT EFFECTIVE DATE AND RE-APPLICATION REQUIREMENTS

Once the stormwater BMP is installed and a credit application is approved by the Department, the credit will be applied to the stormwater utility fee for the next fiscal year following approval of the credit. For example, if a homeowner submits an application for a rain barrel on October 1, 2015 and is approved on October 30, 2015, then the credit will be applied to the fee on July 1, 2016. Be advised that review may take 45 days.

Credits will be valid for five (5) years from date of application approval or until transfer of ownership (i.e. sale of the property to another party), whichever is first. The owner will need to re-apply for the credit every five (5) years. Proper installation and maintenance is required to continue receiving credit. To re-apply, the applicant shall submit a completed Stormwater Utility Fee Credit Re-Application for Non-Residential (Appendix C).



The stormwater credit applies only to the applicant. Credits do not transfer with ownership changes. A new application and a copy of the maintenance agreement must be submitted by the new property owner to receive the credit. Upon transfer of ownership, the City encourages the current owners to share a copy of the application, maintenance records and photographs with the new owner. In the event this information is not provided to the new owner, the new owner may contact the Public Works Department to obtain previous records for the BMP (if available) and apply for the credit.

To reinstate a revoked credit, if within five (5) years of the original or most recent credit reapplication, the applicant shall provide the Public Works Department with a completed copy of the Stormwater Utility Fee BMP Maintenance Record (Appendix E) and current photos (no

more than 60 days old) of the BMP(s) showing the BMP deficiencies have been corrected as recommended by city staff.

If credits have been revoked or credits have expired (5) years after the latest approved application), the property owner must submit a new Stormwater Utility Fee Credit Application to reinstate the credits.

8 APPROVED STORMWATER BEST MANAGEMENT PRACTICES

Non-residential property owners that implement stormwater BMPs to reduce the stormwater flow rate (volume) and/or pollutant load of runoff from their properties to the stormwater system or surrounding bodies of water can qualify to receive a reduction in their stormwater fee. The stormwater BMPs cannot be owned and/or maintained by the City.

- ✓ Selecting more than one stormwater BMP is encouraged.
- ✓ The maximum credit allowed per parcel is fifty percent (50%).
- Other stormwater management practices may be approved on a case -by -case basis.

Approved BMPs are as per the Virginia Department of Environmental Quality (DEQ) Stormwater Design Specifications or the Chesapeake Bay Program's Urban Stormwater Protocols.

DEQ Stormwater Design Specifications

http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx (Click on 2013 BMP Standards & Specifications)

<u>Chesapeake Bay Program's Urban Stormwater Protocol for Urban Stormwater Retrofit: Final CBP Approved Expert Panel Report on Stormwater Retrofit</u>

http://chesapeakestormwater.net/bay-stormwater/baywide-stormwater-policy/urban-stormwater-workgroup/retrofits/

Chesapeake Bay Program's Urban Stormwater Protocol for Urban Stream Restoration: Final http://chesapeakestormwater.net/bay-stormwater-baywide-stormwater-policy/urban-stormwater-workgroup/urban-stream-restoration/

9 CREDIT CALCULATIONS EXAMPLES

All credit calculations will be provided by the homeowner using the credit calculation worksheet (see Section 11) or as shown below. The calculations will be reviewed and approved by the City of Harrisonburg prior to receiving the credit.

The following examples illustrate the calculation of the annual credit for non-residential properties.



A: VSMP Required On-Site BMPs Providing Water Quantity **OR** Quality Controls Calculation:

For this example, the total impervious area on this parcel is approximately 466,200 square feet (sf), the original stormwater fee is \$9,786, and BMP provides only water quantity benefits.

Step A1: Determine the percent of impervious area draining to the BMP. For this example, assume 350,000 sf of impervious area is draining to the BMP.

% of impervious area draining to BMP = (Impervious area draining to the BMP) ÷ (total impervious area)

75% = 350,000 sf ÷ 466,200 sf

Step A2: Calculate the credit earned for a VSMP required on-site BMP built to provide only water quantity controls using the percent impervious treated found in step A1.

Credit Earned = $[(15\%) \times (75\%)] \times (\$9,786.00) = \$1,100.93$ per year

Step A3: Calculate the total reduced annual fee by subtracting the original fee by the credit earned (step A2).

Total Reduced Annual Fee = \$9,786.00 - \$1,100.93 = \$8,685.07 per year

B: VSMP Required On-Site BMPs Providing Water Quantity AND Quality Controls Calculation:

For this example, the total impervious area on this new development parcel is approximately 60,000 square feet (sf), the original stormwater fee is \$1,260, and a BMP was constructed and complies with the VSMP and the City's ordinance for new development. The BMP provides an additional 2 pounds per year of phosphorous reduction over the required amount of 3.5 pounds per year.

Step B1: Determine the percent of impervious area treated by the BMP. For this example, assume 40,000 sf of impervious area is treated by the BMP.

% of impervious area treated by (draining to) BMP =

(Impervious area treated by BMP) ÷ (total impervious area)

Step B2: Calculate the percentage increase of phosphorous removal above the required phosphorous removal.

$$% Increase = 2.0 \div 3.5 = 57\%$$

As per the table in Section 5, since less than five (5) pounds per year of phosphorous was required to be removed and an additional 57% is provided over the required, a 25% credit is allowable.

Step B2: Calculate the credit earned for BMP that complies with the VSMP and the City's ordinance for new development using the percent impervious treated found in step B1.

Credit Earned =
$$[(25\%) \times (66.7\%)] \times (\$1,260) = \$210.00$$
 per year

Step B3: Calculate the total reduced annual fee by subtracting the credit earned (step B2) from the original fee.

Total Reduced Annual Fee = \$1,260.00 - \$210.00 = \$1,050.00 per year

C: On-Site Stormwater Management Facilities Treating Off-Site Impervious Area Calculation:

For this example, the total impervious area on this parcel is approximately 100,000 square feet (sf), the original stormwater fee is \$2,100, and BMP was <u>voluntarily constructed</u> providing both quality and quantity control and serves approximately 60,000 of off-site impervious area.

Step C1: Determine the percent of impervious area treated by the BMP. For this example, assume 60,000 sf of impervious area is treated by the BMP.

% of impervious area treated by (draining to) BMP =
(on- and/or off-site impervious area treated by BMP) ÷
(total on-site impervious area)

60% = 60,000 sf ÷ 100,000 sf

Step C2: Calculate the credit earned for BMP that serves approximately 60,000 sf of off-site impervious area using the percent impervious treated found in step C1.

Credit Earned = $[(100\%) \times (60\%)] \times (\$2,100) = \$1,260.00$ per year

Step C3: Calculate the total reduced annual fee by subtracting the credit earned (step C2) from the original fee.

Total Reduced Annual Fee = \$2,100 - \$1,260 = **\$840** per year

However, since the total reduced annual fee is less than 50% of the original fee $($2,100.00 \times 0.5 = $1,050.00)$, the actual total reduced annual fee is \$1,050.00.

10 DEFINITIONS

Billing unit means five hundred (500) square feet of impervious area.

BMP or "Best Management Practice" is defined as schedules of activities, prohibitions of practices, including both structural and nonstructural practices, maintenance procedures, and other management practices used to prevent or reduce the pollution of surface waters and groundwater systems.

Developed property means real property that has been altered from its "natural" state by the addition of any improvements such as buildings, structures and other impervious surfaces.

Impervious means surface area composed of material that significantly impedes or prevents natural infiltration of water into soil.

Non- Residential Properties are defined as any property that does not have a single-family, duplex, or townhome dwelling and is used for multi-family residential, commercial, industrial, or other non-residential purpose.

Pervious Surface means a surface composed of material that allows water to be absorbed into the ground, reducing runoff and filtering pollutants.

Regional BMP means a BMP that accepts and treats runoff from multiple separate properties. Regional BMPs are often owned by a Property Association or other entity responsible for regular maintenance and inspections.

Stormwater Quality refers to the chemical, physical, and/or biological characteristics of surface water.

Stormwater Quantity refers to the flow rate or volume of surface runoff from a property.

Utility fees means any permit or local program fees as allowed by the Code of Virginia.

11 RESOURCES

City of Harrisonburg Stormwater Management Program Public Works Department 540-434-5928

http://www.harrisonburgva.gov/stormwater-management-program

City of Harrisonburg Stormwater Utility Program http://www.harrisonburgva.gov/stormwater-utility

City of Harrisonburg Ordinance, Title 6, Chapter 5, Stormwater Utility <Insert link>

CleanStream.org
Local water quality information
http://www.cleanstream.org

540-433-5853 x 3

Department of Forestry
Information on Water Quality and rain gardens
Rain garden Technical Guide
http://www.dof.virginia.gov
434-977-6555

Shenandoah Valley Soil & Water Conservation District Watershed education, low impact development information, backyard conservation, lawn and tree care tips, rain garden and rain barrel information http://svswcd.org/

Virginia Department of Environmental Quality
Watershed education, lawn care and pet waste information, land conservation
http://www.dcr.virginia.gov
804-786-1712

Chesapeake Bay Foundation
Water Quality, Lawn care tips, Bay education, rain garden & rain barrel information
http://www.cbf.org
804-648-4011

Alliance for the Chesapeake Bay
Bay education, Clean Stream projects, rain barrel and native landscaping information
http://www.allianceforthebay.org
804-775-0951

12 NATIVE PLANT REFERENCES

The information below is provided as a resource to assist property owners with selection of trees and plants on their properties.

Fairfax County, Rain Garden Design & Construction: A Northern Virginia Homeowner's Guide, http://www.fairfaxcounty.gov/nvswcd/raingarden.htm

Northern Virginia Soil & Water Conservation District, 10 Common Rain Garden Plants, http://www.novaregion.org/index.aspx?NID=977

Northern Virginia Soil & Water Conservation District, et al., Residential Low Impact Landscaping Handbook, http://www.fairfaxcounty.gov/nvswcd/raingarden.htm

Virginia Cooperative Extension, Urban Water-Quality Management: Rain Garden Plants, http://pubs.ext.vt.edu/426/426-043/426-043.html

Virginia Department of Conservation & Recreation, Native Plants for Conservation, Restoration, and Landscaping, http://www.dcr.virginia.gov/natural heritage/nativeplants.shtml.

Virginia Department of Forestry, Common Native Trees, Tree Identification Guide, http://www.dof.virginia.gov/print/edu/Common-Native-Trees.pdf

Virginia Department of Forestry, Rain Gardens Technical Guide, http://www.raingardensforthebays.org/wp-content/uploads/2013/04/pub-Rain-Garden-Tech-Guide 2008-05.pdf

US Fish & Wildlife Service, Native Plants for Wildlife Habitat and Conservation Landscaping: Chesapeake Bay Watershed, http://www.nps.gov/plants/pubs/Chesapeake/toc.htm

Plant Invaders of the Mid-Atlantic Natural Areas, http://www.nps.gov/plants/ALIEn/pubs/midatlantic/index.htm (Non-native/invasive plants are not recommended)

APPENDICES

APPENDIX A.	STORMWATER UTILITY FEE CREDIT APPLICATION FOR NON-RESIDENTIAL
APPENDIX B.	STORMWATER UTILITY FEE NON-RESIDENTIAL MAINTENANCE AGREEMENT FOR PRE-EXISTING STORMWATER MANAGEMENT/BMP FACILITIES REQUIRED TO SATISFY DEVELOPMENT REGULATIONS
APPENDIX C.	STORMWATER UTILITY FEE MAINTENANCE AGREEMENT FOR USE WITH VOLUNTARILY INSTALLED NON-RESIDENTIAL BMPS
APPENDIX D.	NEW DEVELOPMENT BMP MAINTENANCE AGREEMENT
APPENDIX E.	STORMWATER UTILITY FEE CREDIT RE-APPLICATION
APPENDIX F.	STORMWATER UTILITY FEE PETITION FOR ADJUSTMENT FORM
APPENDIX G.	STORMWATER UTILITY FEE BMP MAINTENANCE RECORD
APPENDIX H.	REGIONAL STORMWATER BMP AGREEMENT FORM
APPENDIX I.	CREDIT APPLICATION GUIDE FOR EXISTING NON-RESIDENTIAL BMPS
APPENDIX J.	PROCEDURES FOR COMPLETING THE PRE-EXISTING STORMWATER MANAGEMENT/BMP FACILITIES MAINTENANCE AGREEMENT AND APPLYING FOR A STORMWATER UTILITY FEE CREDIT
APPENDIX K.	ON-SITE REQUIRED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN
APPENDIX L.	RETOFITTED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN
APPENDIX M.	VOLUNTARILY INSTALLED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN
APPENDIX A.	STORMWATER UTILITY FEE CREDIT APPLICATION FOR NON-RESIDENTIAL
APPENDIX B.	STORMWATER UTILITY FEE NON-RESIDENTIAL MAINTENANCE AGREEMENT
APPENDIX C.	STORMWATER UTILITY FEE CREDIT RE-APPLICATION
APPENDIX D.	STORMWATER UTILITY FEE PETITION FOR ADJUSTMENT FORM

APPENDIX E. STORMWATER UTILITY FEE BMP MAINTENANCE RECORD

APPENDIX F. REGIONAL STORMWATER BMP AGREEMENT FORM

APPENDIX A.	STORMWATER	UTILITY FEE CF	REDIT APPLICA	TION FOR NON-	RESIDENTIAL

Date Received:	MAR	RISO	
Credit Application ID:			
Original Fee:	VIRG	SINIA	
Credit Amount:	•	onburg, Virginia of Public Works	
Revised with Credit Applied:		Mosby Road	
Percentage of Credit:	Harrisonburg, VA 22801		
	5.5.5	arrisonburgva.gov	
Stormwa	ter Utility Fee C For Non-Ro Submit <u>ONE</u> Appl		
☐ For Pre-Installation Review			
☐ For Final Credit Application			
☐ To Reinstate an Expired Credit (For r	e-applications of credi	it not yet expired, see Appendix C.)	
General Information:			
Parcel Information			
Tax Map Parcel Number(s):			
Parcel Street Address:			
Owner Information			
Owner Name (Last, First, M.I. or Busine	ss):		
Owner Mailing Address (w/ Apartment	Unit, if applicable):		
City:	State:	Zip Code:	
If Business, Contact Name (Last, First, N	1.l.):		
Phone Number (w/Area Code): ()	Email:	
Type of BMP Installed (check NOTE: Stormwater management calculations)		uction plans, record drawings, pollutant removal	
		ter BMP must be submitted with this credit applicat	
☐ Category A. Required On-Site	BMP Providing W	Vater Quantity OR Quality Control to Satisf	

Development Regulations.

(Check only boxes that are applicable)

Type of BMP Installed:

Impervious Area Treated by BMP (sq. ft.):
☐ This is an on-Site BMP Treating Off-Site Impervious Areas — Department of Public Works staff will advise you on required documentation.
☐ This is a Regional BMP – Department of Public Works staff will advise you on required documentation.
Maintenance Agreement
☐ A Maintenance Agreement has been recorded at the Rockingham County Clerk of Court's office.
Pollutant Removal Overage (optional):
☐ This BMP has additional water quality pollutant removal beyond the required pollutant removal for the site that I will forfeit to the City in exchange for Stormwater Utility Fee Credits as calculated in Appendix K or L of the Stormwater Utility Fee Non-Residential Credit Manual.
Amount of lbs TP/ year forfeited to the City of Harrisonburg:
Amount of lbs TN/ year forfeited to the City of Harrisonburg:
Amount of lbs TSS/ year forfeited to the City of Harrisonburg:
Category B. On-Site BMP Providing Water Quantity AND Quality Control (Check only boxes that are applicable) Type of BMP Installed:
Impervious Area Treated by BMP (sq. ft.):
☐This is an On-Site BMP Treating Off-Site Impervious Areas – Department of Public Works staff will advise you on required documentation.
☐ This is a Regional BMP — Department of Public Works staff will advise you on required documentation.
Maintenance Agreement:
☐ A Maintenance Agreement has been recorded at the Rockingham County Clerk of Court's office.
Pollutant Removal Overage (optional):
☐ This BMP has additional water quality pollutant removal beyond the required pollutant removal for the site that I will forfeit to the City in exchange for Stormwater Utility Fee Credits as calculated in Appendix K or L of the Stormwater Utility Fee Non-Residential Credit Manual.
Amount of lbs TP/ year forfeited to the City of Harrisonburg:

Amount of lbs TN/ year forfeited to the City of Harrisonburg:		
Amount of lbs TSS/ year forfeited to the City of Harrisonburg:		
□ Category C. Voluntary On-Site Water Quality BMP (Check only boxes that are applicable)		
Type of BMP Installed:		
Impervious Area Treated by BMP (sq. ft.):		
☐ This is an On-Site BMP Treating Off-Site Impervious Areas — Department of Public Works staff will advise you on required documentation.		
☐ This is a Regional BMP – Department of Public Works staff will advise you on required documentation.		
BMP Certification:		
This facility was designed and built in accordance with required standards and specifications and/or Chesapeake Bay Program's Urban Stormwater Protocols effective on the date of the start of construction or was provisionally approved by the City in a pre-installation review application. Detail provided in attached Stormwater Calculations. Yes \square No \square		
Maintenance Agreement:		
☐ A Stormwater Utility Fee Maintenance Agreement for Voluntarily Installed Non-Residential BMPs has been completed and is attached to this application.		
Pollutant Removal (required):		
☐ This BMP has additional water quality pollutant removal beyond the required pollutant removal for the site that I will forfeit to the City in exchange for Stormwater Utility Fee Credits as calculated in Appendix M.		
Percentage of Available Pollutant Removal forfeited:		
Amount of lbs TP/ year forfeited to the City of Harrisonburg:		
Amount of lbs TN/ year forfeited to the City of Harrisonburg:		
Amount of lbs TSS/ year forfeited to the City of Harrisonburg:		

□ Category D. Industrial VPDES Permit
Type of VPDES permit:
On-Site Impervious Area Covered by VPDES permit (sq. ft.):
Required Attachments:
For BMPs:
☐ Photographs of BMP
Date Photos were taken: (must be no more than 60 days old)
☐ Signed Maintenance Agreement (check only boxes that are applicable)
Copy of Stormwater Management/BMP Facilities Maintenance Agreement (used for new BMPs required for site development) recorded at the Rockingham County Clerk of Court's office
Copy of Stormwater Management/BMP Facilities Maintenance Agreement for Pre-Existing Stormwater Management/BMP Facilities Required to Satisfy Development Regulations recorded at the Rockingham County Clerk of Court's office
Stormwater Utility Fee Maintenance Agreement for Voluntarily Installed Non-Residential BMPs
☐ Most recently completed Inspection Form (by Professional Engineer)
Construction Plans Attached to application On File with City; please confirm with Public Works
☐ Stormwater Management Calculations
☐ Stormwater Utility Fee Credit Calculations
☐ Pollutant Removal Calculations (Using Spreadsheets in Appendix K, L, or M)
☐ Stormwater Utility Fee Regional BMP Agreement, if applicable
For Industrial VPDES Permit:
□ Copy of Virginia DEQ General Permit Coverage Letter
□ Copy of Stormwater Pollution Prevention Plan (SWPPP)
\Box Copy of latest Discharge Monitoring Report (DMR) Note: Copies of future DMRs shall be submitted to City at time of submittal to DEQ.
☐ Stormwater Utility Fee Credit Calculations

Signature of Agreement

pollutant credits approved by the City of available for any other use, including V	_	mwater Utility Fee Credits will no longer be nagement Program requirements.
Owner Printed Name		
Owner Signature	Date	
	FOR CITY USE ONLY	
Application administratively complete and c	redit applied 🗌 Yes	☐ No
Application Credit denied based on the follo	wing:	
Reviewed by:	_ Date:	
Property Owner Letter Mailed: Yes Dat	te:	

I hereby certify the above information to be true and correct to the best of my knowledge. I agree that

APPENDIX B.	STORMWATER UTILITY FEE NON-RESIDENTIAL MAINTENANCE AGREEMENT

CITY OF HARRISONBURG, VA

STORMWATER MANAGEMENT/BMP FACILITIES MAINTENANCE AGREEMENT

For Pre-Existing Stormwater Management/ BMP Facilities Required to Satisfy
Development Regulations

THIS AGREEMENT, made and entered into this day of,, by
and between hereinafter called the (Insert Full Name of Owner)
"Landowner", and the City of Harrisonburg, a Virginia municipal corporation, hereinafter called the "City".
WITNESSETH:
WHEREAS, the Landowner is the owner of certain real property described as City of
Harrisonburg Tax Map/Parcel as recorded by deed in the land
records of Rockingham County, Virginia, Deed Book/Page,
hereinafter called the "Property";
and
WHEREAS, the Site Plan/Subdivision Plan known as,,
prepared by,
hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be
approved by the City, provides for Best Management Practices (BMPs) for detention and/or
treatment of stormwater within the confines of the Property; and
WHEREAS, approximate locations of specific BMP facilities included on the Plan are
shown on the attached
Copy of City-approved final subdivision plat, or
City-approved scaled exhibit drawing of Property; and
WHEREAS, the Landowner desires that existing on-site stormwater management/ BMP
facilities serve to provide a credit against stormwater utility fees; and
WHEREAS, the City requires that on-site stormwater management/BMP facilities so
credited be adequately maintained by the Landowner, its successors and assigns, including any
homeowners association.
NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants
contained herein, and the following terms and conditions, the parties hereto agree as follows:
1. As a condition of this maintenance agreement, the Landowner has obtained a
professional engineer to inspect the stormwater management/ BMP facility on the Property who
has documented that the facility is in good working order.
2. The Landowner, its successors and assigns, including any homeowners association,
shall adequately maintain the stormwater management/BMP facilities. This includes all pipes
and channels built to convey stormwater to the facility, as well as all structures, improvements,
and vegetation provided to control the quantity and quality of the stormwater. Adequate
maintenance is defined as good working condition so that these facilities are performing their

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design functions. The required Inspection Report form(s) is(are) to be used to establish what good working condition is acceptable to the City.

- 3. The Landowner, its successors and assigns, shall inspect the stormwater management/BMP facility and submit an inspection report every five years by the method and date prescribed in the latest City's Design and Construction Standards Manual. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, pond areas, access roads, etc. Deficiencies shall be noted in the inspection report.
- 4. The Landowner, its successors and assigns, hereby grants permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the stormwater management/BMP facilities whenever the City deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The City shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.
- 5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management/BMP facilities in good working condition acceptable to the City, the City may, after proper notice, enter upon the Property and take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. The City shall allow Landowner 90 days from the date of the notice of deficiency to make necessary repairs before taking this action; however, for large scale repair work the City may, on a case-by-case basis, allow the Landowner to present for consideration an Action Plan and schedule for repairs. In such cases the City may require a bond, letter of credit, cash escrow or other acceptable surety to guarantee the work. This provision shall not be construed to allow the City to erect any structure of permanent nature on the land of the Landowner. It is expressly understood and agreed that the City is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.
- 6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. A maintenance schedule should follow those prescribed in the Plan or in the current Virginia Stormwater Management Handbook, along with any recommendations included in the City's Design and Construction Standards Manual, manufacturers' guidelines, etc. This schedule shall be followed by the landowner, its successors and assigns.
- 7. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the City within thirty (30) days of demand thereof for all actual costs incurred by the City hereunder. This shall include costs which exceed those obtained through a surety provided in association with an Action Plan as described in Item 5 above.
- 8. Additionally, if maintenance actions are not corrected by the Landowner within 90 days after notification is sent, the revocation of the stormwater utility fee credits will take place automatically .
- 9. If the City, after proper notice, takes action to correct deficiencies identified in the inspection report, the Landowner will not be eligible for stormwater utility fee credits for 5 years following the date of repair being completed. In no event shall the Landowner, its successors or

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Project Name:	

assigns, be eligible for Stormwater Utility Fee credits if the City has not been reimbursed for its costs to correct any deficiency of the facilities.

- 10. Landowner, by execution of this Agreement, acknowledges that Landowner has reviewed with an Engineer the specifics of the Plan and understands the function and maintenance requirements of all BMPs provided for on the Plan. Landowner agrees to maintain a copy of the Plan through the duration of ownership, and to transfer that plan to the new owner upon relinquishing the property.
- 11. This Agreement imposes no liability of any kind whatsoever on the City and the Landowner agrees to hold the City harmless from any liability in the event the stormwater management/BMP facilities fail to operate properly.
- 12. This Agreement shall be recorded among the land records in the Clerk's Office of the Circuit Court of Rockingham County, Virginia, and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, heirs and any other successors and assigns in interests, including any homeowners association.
 - 13. This agreement shall be governed by the laws of the Commonwealth of Virginia.
- 14. Any disputes arising from or as a result of this Agreement shall be resolved in the Circuit Court of Rockingham County, Virginia.
- 15. If any provision of this Agreement is found to be illegal, invalid, or unenforceable, that shall not affect the validity or enforceability of any other provision of this agreement.

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.	-3-	

WITNESS the follow	ving signatures and seals:	
	Company/Corporation/Partnership Name By:	
	(Type Name)	
	(Type Title)	
STATE OFCITY/COUNTY OF		
The foregoing	g Agreement was acknowledged before me this day of ,	
, · · ʃ		
	NOTA DV DUDI IC	
	NOTARY PUBLIC pires:	
My Commission No.	is:	

Project Name:

CITY OF HARRISONBURG, VIRGINIA

		oko, vikonvir	
By: Kurt D	D. Hodgen		
Its: City Man			
STATE OF CITY/COUNTY OF The foregoing Agreement wa, by Kurt D. Hodgen, City Ma	as acknowledge	ed before me this day _	of,
My Commission Expires: My Commission No. is:		ARY PUBLIC —	
Approved as to Form:			
City Attorney	Date		

Project Name:

APPENDIX I. CREDIT APPLICATION GUIDE FOR EXISTING NON-RESIDENTIAL BMPS



City of Harrisonburg, Virginia
Department of Public Works
320 East Mosby Road
Harrisonburg, VA 22801
540-434-5928
stormwater@harrisonburgva.gov

Credit Application Guide for Existing Non-Residential BMPs

This information is provided to assist property owners in collecting information and documentation required to complete a Stormwater Utility Credit Application for Non-Residential properties. Property owners should contact a professional engineering firm for assistance.

- 1. Review the Stormwater Utility Fee Credit Manual for Non-Residential, www.harrisonbugva.gov/stormwater-utility. Then go to step 2.
- 2. Locate your property's Site Development Plans and Stormwater BMP calculations. We strongly recommend contacting the professional engineering firm who developed the original site plans and stormwater calculations as they can best assist you. If you do not know who that is, you may contact Harrisonburg Department of Community Development (540-432-7700) and they can provide you access to copies of plans and calculations. Community Development asks that you fill out a *Request to View Development Files in Community Development* form which can be sent electronically or submitted hardcopy to Community Development. Please allow 3-5 business days to arrange a time to view the files. Go to step 3.
- 3. Determine whether your existing stormwater BMP has a recorded Maintenance Agreement on file with the Rockingham County Clerk of Court's office. (Harrisonburg Department of Community Development can assist with this determination. The *Request to View Development Files in Community Development* form should be filled out for this request.)
 - a. If yes, keep a copy of the Maintenance Agreement and go to step 4.
 - b. If not, go to Procedures for completing the Pre-Existing Stormwater Management/ BMP Facilities Maintenance Agreement.
- 4. As required by the Maintenance Agreement and referenced in the City's Design & Construction Standards Manual (http://www.harrisonburgva.gov/dcsm), determine whether your stormwater BMP been inspected in the last 5 years and if the inspection form was submitted to, and accepted by the Harrisonburg Department of Community Development.
 - a. If yes, keep a copy of the inspection form and go to step 6.

- b. If not, go to step 5.
- 5. Hire a professional engineer to inspect your stormwater BMP to document that it is in good, working order and complete the inspection form (available in the Virginia Stormwater Management Handbook, http://www.deq.virginia.gov/fileshare/wps/2013_SWM_Handbook/Chapter%2009/ Click on Appendix 9 Chapter 9C.) If any repairs are needed, make repairs, and have a professional engineer complete an inspection form before continuing with your Credit Application. Once the stormwater BMP is documented to be in good, working order continue to 6.
- 6. Fill out the Stormwater Utility Fee Credit Application for Non-Residential Form and submit required attachments to Harrisonburg Public Works. Once approved by the Public Works department, go to step 7.
- 7. As outlined in the Agreement and Credit Manual,
 - a. The property owner is responsible for having a professional engineer conduct inspections of their BMP(s) once every five years. The inspection report is to be submitted to the Department of Community Development. Reports shall be submitted to the Department of Community Development by July 1 of the inspection year, no earlier than 60 days prior.
 - b. The deed runs with the land and the stormwater management/ BMP facility must be adequately maintained by the Landowner and successors.
 - c. If maintenance actions are not corrected by the Landowner within the time prescribed in the Agreement, the revocation of the stormwater utility fee credits will take place automatically.

APPENDIX J. PROCEDURES FOR COMPLETING THE PRE-EXISTING STORMWATER MANAGEMENT/BMP FACILITIES MAINTENANCE AGREEMENT AND APPLYING FOR A STORMWATER UTILITY FEE CREDIT

APPENDIX F. REGIONAL STORMWATER BMP AGREEMENT FORM



City of Harrisonburg, Virginia
Department of Public Works
320 East Mosby Road
Harrisonburg, VA 22801
540-434-5928
stormwater@harrisonburgva.gov

Procedures for completing the *Pre-Existing Stormwater Management/ BMP Facilities Maintenance Agreement* and applying for a stormwater utility fee credit

These steps to be completed by the owner of a property to receive stormwater utility fee credit (reduced fee) for an existing stormwater BMP that (a) was constructed to satisfy development regulations and (b) does not have a maintenance agreement recorded at the Rockingham County Clerk of Court's office.

- As outlined in the Stormwater Utility Fee Credit Manual for Non-Residential, prior to recording
 the deed, the landowner shall have a licensed professional engineer or other person who holds
 a certificate of competence described in <u>Virginia Code 9VAC24-870-114</u> to verify that the BMP is
 functioning correctly. The applicant must keep a copy of inspection documentation to submit to
 the City.
- 2. Once the pre-existing BMP has been documented to be functioning properly, the owner shall have the Maintenance Agreement recorded. Steps for recording the Maintenance Agreement:
 - a. Submit draft maintenance agreement to Public Works for review. The agreement shall include a vicinity map, site map with roads, property tax map number, and location of "BMP Boundary" or "BMP Area(s)" shown on the map. If possible, a reference should be made back to the original site plan. If multiple BMPs are located on the property, only one maintenance agreement needs to be submitted as long as the appropriate exhibits designating "BMP Area(s)" are also provided.
 - b. If revisions to the agreement are required, Public Works will inform the landowner.
 - c. If approved by Public Works, city staff will submit to the City Attorney for the City Manager to sign.
 - d. The signed maintenance agreement will be returned to the Landowner, who will also sign, and then will have the maintenance agreement recorded at the Rockingham County Clerk of Court's office at the owner's expense.

- 3. Landowner will submit the Stormwater Utility Fee Application, copy of recorded Maintenance Agreement, and other required documentation as outlined in the *Stormwater Utility Fee Credit Manual for Non-Residential* to Public Works.
- 4. Public Works will have 45 days to approve or deny the stormwater utility fee application.
- 8. As outlined in the Agreement and Credit Manual,
 - a. The property owner is responsible for having a professional engineer conduct inspections of their BMP(s) once every five years. The inspection report is to be submitted to the Department of Community Development. Reports shall be submitted to the Department of Community Development by July 1 of the inspection year, no earlier than 60 days prior.
 - b. The deed runs with the land and the stormwater management/ BMP facility must be adequately maintained by the Landowner and successors.
 - c. If maintenance actions are not corrected by the Landowner within the time prescribed in the Agreement, the revocation of the stormwater utility fee credits will take place automatically.

APPENDIX K. ON-SITE REQUIRED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN

Appendix K: On-Site Required BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern

Site Charact		dir	ug (TD Load)		lbs TP/yr <i>From VSMP Calculatio</i>	nc
•			re Load) re Loading (TP Al	low)	lbs TP/yr From VSMP Calculation	
Allowed Fost B	revelopine		Tr Lodding (Tr 7ti	10 10	iss wy, rom vsim carculation	.5
Design Char	racterist	ics	<u>.</u>			
Type of BMP In	stalled		-			
Design Guidelir	nes DEQ Cl	ear	ing House / Bay I	Program (Circle One)	_	
Enter appropri	ate remova	ıl e	fficiencies based	on design guidelines s	see attached tables	
Phosphorous R	emoval Eff	icie	ency (TP)		% Use Table V.A.1 DEQ	
Nitrogen Remo	val Efficier	ncy	(TN)		 % Use Table V.A.1 DEQ	
Suspended Soli			· · ·		_ % Use Table V.C.1*	
•					*If BMP is not located in Table V.C.1, see Public	
Calculation	S (Round C	alc	ulations to 2-dec	imal places)	Works Staff	
TP Reduction						
		_	=		lbs TP/yr	
	ΓΡ Load	-	TP Allow	TP Reduction		
				Required		
		Х	% =		lbs TP/yr	
	ΓΡ Load	-	TP	TP Provided		
		_	=		lbs TP/yr	
TF	Provided	-		Total TP Removed	_ ''	
			TP Reduction			
			Required			
•						
TN & TSS Perce	entages					
		÷	=			
	TP Allow	-	TP Provided	TP %	_	
TN Loading						
		Χ	6.9 =		lbs TN/yr	
	ΓP Load	-	TN Ratio	TN Load		
		Χ.	% =		_lbs TN/yr	
]	ΓN Load		TN	TN Removed		

Total TN Removed

TP %

TSS Loading	3					
_		Χ	469.2	=		lbs TN/yr
	TP Load	_	TSS Ratio	· -	TSS Load	_
_		X _	%	=_		lbs TN/yr
	TSS Load	_	TSS	· -	TSS Removed	_
_		Χ_		=_		lbs TN/yr
-	TSS Removed		TP %		Total TSS Removed	

Summary of Removal

rotai Phosphorus Removed =	IDS TP/yr
Total Nitrogen Removed =	lbs TN/yr
Total Suspended Solids Removed =	lbs TSS/yr

 $Removal\ rates\ must\ meet\ the\ minimum\ \%\ increase\ as\ shown\ in\ Table\ 2\ of\ the\ Non-Residential\ Credit\ Manual.$

Name of Individual Completing this Form:

APPENDIX V.A - Virginia Stormwater Clearinghouse BMPs14

To be eligible for these efficiencies, the BMP must meet all the design requirements that are listed in the Virginia Stormwater BMP Clearinghouse's technical specification for that BMP, not just the one inch requirement for runoff depth treated. There are no established efficiencies for TSS in the Virginia Stormwater BMP Clearinghouse. To calculate the TSS reductions, permittees should use the retrofit curves developed by the Bay Program or the Bay Program Established Efficiencies. The methodology for using the retrofit curves is detailed in *Appendix V.B.* For additional information about the Virginia Stormwater BMP Clearinghouse requirements, permittees should see the BMP design standards and specs, which can be found at http://vwrrc.vt.edu/swc/StandardsSpecs.html.

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies							
Practice	5						
Number	Practice	TN	TP				
1	Rooftop Disconnection ¹⁵	25% or 50% ¹	25% or 50% ¹				
	Sheetflow to Vegetated Filter or Conserved Open Space 1	25% or 50% ¹	25% or 50% ¹				
2	Sheetflow to Vegetated Filter or Conserved Open Space 2	50% or 75% ¹	50% or 75% ¹				
3	Grass Channel	28%	23%				
	Vegetated Roof 1	45%	45%				
5	Vegetated Roof 2	60%	60%				
6	Rainwater Harvesting ¹⁵	Up to 90%	Up to 90%				
	Permeable Pavement 1	59%	59%				
7	Permeable Pavement 2	81%	81%				
	Infiltration 1	57%	63%				
8	Infiltration 2	92%	93%				
	Bioretention 1	64%	55%				
	Bioretention 2	90%	90%				
9	Urban Bioretention	64%	55%				
	Dry Swale 1	55%	52%				
10	Dry Swale 2	74%	76%				
	Wet Swale 1	25%	20%				
11	Wet Swale 2	35%	40%				
	Filtering Practice 1	30%	60%				
12	Filtering Practice 2	45%	65%				
	Constructed Wetland 1	25%	50%				
13	Constructed Wetland 2	55%	75%				
	Wet Pond 1	30% (20%) ²	50% (45%) ²				
14	Wet Pond 2	40% (30%) ²	75% (65%) ²				
	Extended Detention Pond 1	10%	15%				
15	Extended Detention Pond 2	24%	31%				

Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B

¹⁴ These efficiencies are up to date as of the publication of this guidance. The most up to date list of approved BMPs and their efficiencies can be found on the Virginia Stormwater BMP Clearinghouse website. If there is a discrepancy between this table and the website, the efficiencies on the website supersede those listed in this table. The TN efficiencies may be found in the bodies of the individual BMP reports.

¹⁵ **NOTE:** There are no Bay Program equivalent efficiency BMPs for Rooftop Disconnection and Rainwater Harvesting. Permittees must use the VA Stormwater Clearinghouse technical criteria and efficiencies to receive credit for these practices.

²Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

APPENDIX V.C - Chesapeake Bay Program, Established Efficiencies

As an alternative to using the Bay Program Curves, permittees may use the Bay Program's established efficiencies for BMPs. Again, these efficiencies may be used for BMPs that do not meet the Virginia Stormwater BMP Clearinghouse design specifications.

Table V.C.1 - Chesapeake Bay Program BMPs, Established Efficiencies

Chesapeake Bay Program BMPs	TN	TP	TSS
Wet Ponds and Wetlands	20%	45%	60%
Dry Detention Ponds and Hydrodynamic Structures	5%	10%	10%
Dry Extended Detention Ponds	20%	20%	60%
Infiltration Practices w/o Sand, Veg.	80%	85%	95%
Infiltration Practices w/ Sand, Veg.	85%	85%	95%
Filtering Practices	40%	60%	80%
Bioretention C/D soils, underdrain	25%	45%	55%
Bioretention A/B soils, underdrain	70%	75%	80%
Bioretention A/B soils, no underdrain	80%	85%	90%
Vegetated Open Channels C/D soils, no underdrain	10%	10%	50%
Vegetated Open Channels A/B soils, no underdrain	45%	45%	70%
Bioswale	70%	75%	80%
Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	10%	20%	55%
Permeable Pavement w/o Sand, Veg. A/B soils, underdrain	45%	50%	70%
Permeable Pavement w/o Sand, Veg. A/B soils, no underdrain	75%	80%	85%
Permeable Pavement w/Sand, Veg. C/D soils, underdrain	20%	20%	55%
Permeable Pavement w/Sand, Veg. A/B soils, underdrain	50%	50%	70%
Permeable Pavement w/Sand, Veg. A/B soils, no underdrain	80%	80%	85%

BMP efficiencies for wetland restoration vary depending on hydrogeomorphic region as listed below in *Table V.C.2*. To use this table the permittee will need to determine which region their MS4 is in and use the appropriate efficiency. If the permittee is unsure which Hydrogeomorphic Region it is located in, resources are available through the USGS at http://chesapeake.usgs.gov/data.html.

Table V.C.2 – Chesapeake Bay Program BMPs, Established Efficiencies Regionally Impacted

Chesapeake Bay Program Hydrogeomorphic Region affected efficiencies									
BMPs	TN	TP	TSS						
Wetland Restoration	Wetland Restoration Appalachian Plateau Siliciclastic Non-Tidal								
Wetland Restoration	Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	25%	50%	15%					
Wetland Restoration	Blue Ridge Non-Tidal; Mesozoic Lowlands Non-Tidal; Valley and Ridge Carbonate Non-Tidal; Piedmont Crystalline Non-Tidal; Piedmont Carbonate Non-Tidal; Valley and Ridge Siliciclastic Non-Tidal	14%	26%	8.0%					

APPENDIX L. RETOFITTED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN

Appendix L: Retrofitted BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern

			riemova	r nates for r offatar	its of c orrect		
Site Chara	acteristics	<u> </u>					
Total Area				Acres (Draining to BN	⁄IР)		
Impervious A	Area (IA)			Acres (Draining to BN	⁄IР)		
Pervious Are	a (PA)			Acres (Draining to BN	ΛP)		
Design Ch	<u>aracteris</u>	<u>tics</u>	<u>}</u>				
Existing BMP					_		
Design Guide	elines shall b	e ba	ased on Origina	l Design	<u> </u>		
Enter approp	oriate remov	al e	fficiencies base	d on design guidelines			
Phosphorous	s Removal Et	ficie	ency (TPe)		% Use Table V	V.A.1 DEQ or Table V.C.1 Bay	
Nitrogen Rer			_		_ % Use Table V	/.C.1	
_			fficiency (TSSe)		_ % Use Table V	/.C.1*	
•			, \ <u>,</u>		— *If BMP is not I	located in Table V.C.1, see Public	
					Works Staff	,	
Proposed BN	ЛР Туре						
Design Guide	elines <u>DEQ C</u>	lear	ing House / Ba	y Program (Circle One)	_		
Enter approp	oriate remov	al e	fficiencies base	d on design guidelines s	ee attached tab	oles	
Phosphorous	s Removal Et	ficie	ency (TPp)		% Use Table V	V.A.1 DEQ or Table V.C.1 Bay	
Nitrogen Rer	moval Efficie	ncy	(TNp)		_ % Use Table V	A.1 DEQ or Table V.C.1 Bay	
_			fficiency (TSSp)		% Use Table V.C.1*		
			, (_	located in Table V.C.1, see Public	
					Works Staff	,	
Calculatio	ns (Round	Calc	ulations to 2-de	ecimal places)			
Removal Eff	<u> </u>					7	
		_			Use decimal		
_	ТРр	_ •	Tpe	TP	_		
	1	_	, -		Use decimal		
_	TNp		Tne	TN	_		
		_			Use decimal		
_	TSSp		TSSe	TSS			
						_	
TP Loading							
_		_ X	1.62	=	lbs TP/yr		
	IA		TP Loading	IA Load			
		_ X	0.41	=	lbs TP/yr		
	PA		TP Loading	PA Load			
TD D		v			U TD /		
TP Remova <u>l</u>		_ X		=	_lbs TP/yr		
	IA Load	v	TP	IA Removal	II. a TD / ···		
_	DA 1 = -1	_ X	TD	=	_lbs TP/yr		
	PA Load		TP	PA Removal			
		+		=	lbs TP/yr		

Total TP Removed

PA Removal

IA Removal

	IA Removal		PA Removal		Total TN Removed	-
		+		=		lbs TN/yr
	PA Load		TN		PA Removal	
		Χ		= _		_lbs TN/yr
	IA Load		TN		IA Removal	-
TN Remova	I	Х		=		lbs TN/yr
	PA		TN Loading		PA Load	
_		Χ	10.07	=_		_lbs TN/yr
-	IA	•	TN Loading	-	IA Load	_
TN Loading		Χ	16.86	=		lbs TN/yr

TSS Loading	g	Χ	1171.32	=		lbs TSS/yr
	IA		TSS Loading	-	IA Load	_
		Χ	175.8	=		lbs TSS/yr
	PA		TSS Loading		PA Load	
TSS Remov	al					
·		Χ		=		lbs TSS/yr
	IA Load	_	TSS		IA Removal	_
		Χ		=		lbs TSS/yr
	PA Load	-	TSS		PA Removal	_
		+		=		lbs TSS/yr
	IA Removal	_	PA Removal	_	Total TSS Removed	_

Summary of Removal

	IDS TP/y
Total Phosphorus Removed =	lbs TN/y
Total Nitrogen Removed =	lbs TSS/y
Total Suspended Solids Removed =	

Removal rates must meet the minimum % increase as shown in Table 2 of the Non-Residential Credit Manual.

Name of Individual Completing this Form:

APPENDIX V.A - Virginia Stormwater Clearinghouse BMPs14

To be eligible for these efficiencies, the BMP must meet all the design requirements that are listed in the Virginia Stormwater BMP Clearinghouse's technical specification for that BMP, not just the one inch requirement for runoff depth treated. There are no established efficiencies for TSS in the Virginia Stormwater BMP Clearinghouse. To calculate the TSS reductions, permittees should use the retrofit curves developed by the Bay Program or the Bay Program Established Efficiencies. The methodology for using the retrofit curves is detailed in *Appendix V.B.* For additional information about the Virginia Stormwater BMP Clearinghouse requirements, permittees should see the BMP design standards and specs, which can be found at http://vwrrc.vt.edu/swc/StandardsSpecs.html.

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies									
Practice	5								
Number	Practice	TN	TP						
1	Rooftop Disconnection ¹⁵	25% or 50% ¹	25% or 50% ¹						
	Sheetflow to Vegetated Filter or Conserved Open Space 1	25% or 50% ¹	25% or 50% ¹						
2	Sheetflow to Vegetated Filter or Conserved Open Space 2	50% or 75% ¹	50% or 75% ¹						
3	Grass Channel	28%	23%						
	Vegetated Roof 1	45%	45%						
5	Vegetated Roof 2	60%	60%						
6	Rainwater Harvesting ¹⁵	Up to 90%	Up to 90%						
	Permeable Pavement 1	59%	59%						
7	Permeable Pavement 2	81%	81%						
	Infiltration 1	57%	63%						
8	Infiltration 2	92%	93%						
	Bioretention 1	64%	55%						
	Bioretention 2	90%	90%						
9	Urban Bioretention	64%	55%						
	Dry Swale 1	55%	52%						
10	Dry Swale 2	74%	76%						
	Wet Swale 1	25%	20%						
11	Wet Swale 2	35%	40%						
	Filtering Practice 1	30%	60%						
12	Filtering Practice 2	45%	65%						
	Constructed Wetland 1	25%	50%						
13	Constructed Wetland 2	55%	75%						
	Wet Pond 1	30% (20%) ²	50% (45%) ²						
14	Wet Pond 2	40% (30%) ²	75% (65%) ²						
	Extended Detention Pond 1	10%	15%						
15	Extended Detention Pond 2	24%	31%						

Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B

¹⁴ These efficiencies are up to date as of the publication of this guidance. The most up to date list of approved BMPs and their efficiencies can be found on the Virginia Stormwater BMP Clearinghouse website. If there is a discrepancy between this table and the website, the efficiencies on the website supersede those listed in this table. The TN efficiencies may be found in the bodies of the individual BMP reports.

¹⁵ **NOTE:** There are no Bay Program equivalent efficiency BMPs for Rooftop Disconnection and Rainwater Harvesting. Permittees must use the VA Stormwater Clearinghouse technical criteria and efficiencies to receive credit for these practices.

²Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

APPENDIX V.C - Chesapeake Bay Program, Established Efficiencies

As an alternative to using the Bay Program Curves, permittees may use the Bay Program's established efficiencies for BMPs. Again, these efficiencies may be used for BMPs that do not meet the Virginia Stormwater BMP Clearinghouse design specifications.

Table V.C.1 - Chesapeake Bay Program BMPs, Established Efficiencies

Chesapeake Bay Program BMPs	TN	TP	TSS
Wet Ponds and Wetlands	20%	45%	60%
Dry Detention Ponds and Hydrodynamic Structures	5%	10%	10%
Dry Extended Detention Ponds	20%	20%	60%
Infiltration Practices w/o Sand, Veg.	80%	85%	95%
Infiltration Practices w/ Sand, Veg.	85%	85%	95%
Filtering Practices	40%	60%	80%
Bioretention C/D soils, underdrain	25%	45%	55%
Bioretention A/B soils, underdrain	70%	75%	80%
Bioretention A/B soils, no underdrain	80%	85%	90%
Vegetated Open Channels C/D soils, no underdrain	10%	10%	50%
Vegetated Open Channels A/B soils, no underdrain	45%	45%	70%
Bioswale	70%	75%	80%
Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	10%	20%	55%
Permeable Pavement w/o Sand, Veg. A/B soils, underdrain	45%	50%	70%
Permeable Pavement w/o Sand, Veg. A/B soils, no underdrain	75%	80%	85%
Permeable Pavement w/Sand, Veg. C/D soils, underdrain	20%	20%	55%
Permeable Pavement w/Sand, Veg. A/B soils, underdrain	50%	50%	70%
Permeable Pavement w/Sand, Veg. A/B soils, no underdrain	80%	80%	85%

BMP efficiencies for wetland restoration vary depending on hydrogeomorphic region as listed below in *Table V.C.2*. To use this table the permittee will need to determine which region their MS4 is in and use the appropriate efficiency. If the permittee is unsure which Hydrogeomorphic Region it is located in, resources are available through the USGS at http://chesapeake.usgs.gov/data.html.

Table V.C.2 – Chesapeake Bay Program BMPs, Established Efficiencies Regionally Impacted

Chesapeake Bay Program Hydrogeomorphic Region affected efficiencies									
BMPs	TN	TP	TSS						
Wetland Restoration	Wetland Restoration Appalachian Plateau Siliciclastic Non-Tidal								
Wetland Restoration	Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	25%	50%	15%					
Wetland Restoration	Blue Ridge Non-Tidal; Mesozoic Lowlands Non-Tidal; Valley and Ridge Carbonate Non-Tidal; Piedmont Crystalline Non-Tidal; Piedmont Carbonate Non-Tidal; Valley and Ridge Siliciclastic Non-Tidal	14%	26%	8.0%					

APPENDIX M. VOLUNTARILY INSTALLED BMP SPREADSHEET FOR DETERMINING LOADING RATES AND REMOVAL RATES FOR POLLUTANTS OF CONCERN

Appendix M: Voluntarily Installed BMP Spreadsheet for Determining Loading Rates and Removal Rates for Pollutants of Concern

Si	te	Cha	rac	teri	stics
•	-	U 110			36163

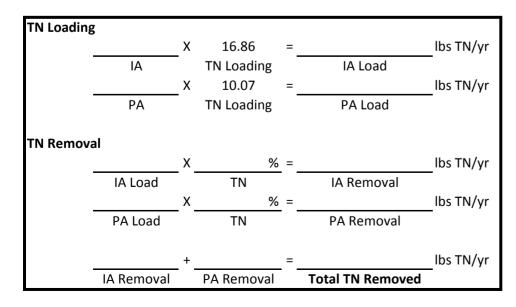
Total Area	Acres (Draining to BMP)
Impervious Area (IA)	Acres (Draining to BMP)
Pervious Area (PA)	Acres (Draining to BMP)

Design Characteristics

Type of BMP Installed Design Guidelines DEQ Clearing House / Bay Program (Circle One) Enter appropriate removal efficiencies based on design quidelines see attached tables % Use Table V.A.1 DEQ or Table V.C.1 Bay Phosphorous Removal Efficiency (TP) Nitrogen Removal Efficiency (TN) % Use Table V.A.1 DEQ or Table V.C.1 Bay Suspended Solids Removal Efficiency (TSS) % Use Table V.C.1* *If BMP is not located in Table V.C.1, see Public Works Staff

Calculations (Round Calculations to 2-decimal places)

	· ·				, ,	
TP Loading						
		Χ	1.62 =	:		lbs TP/yr
-	IA	-	TP Loading		IA Load	
		Χ	0.41 =	:		lbs TP/yr
-	PA	•	TP Loading		PA Load	_
TP Remova	I					
		Χ	% =	:		lbs TP/yr
1	IA Load	-	TP		IA Removal	_
		Χ	% =	:		lbs TP/yr
•	PA Load		TP		PA Removal	=
_		+ _	=	_		lbs TP/yr
	IA Removal		PA Removal		Total TP Removed	



TSS Loading	3					
_		Χ	1171.32	=		lbs TSS/yr
-	IA	•	TSS Loading	•	IA Load	_
_		Χ	175.8	=		lbs TSS/yr
-	PA		TSS Loading	-	PA Load	_
TSS Remov	al					
<u>.</u>		Χ	%	=		lbs TSS/yr
	IA Load		TSS		IA Removal	
<u>.</u>		Χ	%	=		lbs TSS/yr
	PA Load	-	TSS	-	PA Removal	_
		+		=		lbs TSS/yr
_	IA Removal		PA Removal		Total TSS Removed	

Summary of Removal

Total Phosphorus Removed =	lbs TP/yr
Total Nitrogen Removed =	lbs TN/yr
Total Suspended Solids Removed =	lbs TSS/y

Name of Individual Completing this Form:

APPENDIX V.A - Virginia Stormwater Clearinghouse BMPs14

To be eligible for these efficiencies, the BMP must meet all the design requirements that are listed in the Virginia Stormwater BMP Clearinghouse's technical specification for that BMP, not just the one inch requirement for runoff depth treated. There are no established efficiencies for TSS in the Virginia Stormwater BMP Clearinghouse. To calculate the TSS reductions, permittees should use the retrofit curves developed by the Bay Program or the Bay Program Established Efficiencies. The methodology for using the retrofit curves is detailed in *Appendix V.B.* For additional information about the Virginia Stormwater BMP Clearinghouse requirements, permittees should see the BMP design standards and specs, which can be found at http://vwrrc.vt.edu/swc/StandardsSpecs.html.

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies

Table V.A.1 - Virginia Stormwater BMP Clearinghouse BMPs, Established Efficiencies				
Practice	5			
Number	Practice	TN	TP	
1	Rooftop Disconnection ¹⁵	25% or 50% ¹	25% or 50% ¹	
	Sheetflow to Vegetated Filter or Conserved Open Space 1	25% or 50% ¹	25% or 50% ¹	
2	Sheetflow to Vegetated Filter or Conserved Open Space 2	50% or 75% ¹	50% or 75% ¹	
3	Grass Channel	28%	23%	
	Vegetated Roof 1	45%	45%	
5	Vegetated Roof 2	60%	60%	
6	Rainwater Harvesting ¹⁵	Up to 90%	Up to 90%	
	Permeable Pavement 1	59%	59%	
7	Permeable Pavement 2	81%	81%	
	Infiltration 1	57%	63%	
8	Infiltration 2	92%	93%	
	Bioretention 1	64%	55%	
	Bioretention 2	90%	90%	
9	Urban Bioretention	64%	55%	
\tag{8}	Dry Swale 1	55%	52%	
10	Dry Swale 2	74%	76%	
	Wet Swale 1	25%	20%	
11	Wet Swale 2	35%	40%	
	Filtering Practice 1	30%	60%	
12	Filtering Practice 2	45%	65%	
	Constructed Wetland 1	25%	50%	
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	Wet Pond 1	30% (20%) ²	50% (45%) ²	
14	Wet Pond 2	40% (30%) ²	75% (65%) ²	
	Extended Detention Pond 1	10%	15%	
15	Extended Detention Pond 2	24%	31%	

Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B

¹⁴ These efficiencies are up to date as of the publication of this guidance. The most up to date list of approved BMPs and their efficiencies can be found on the Virginia Stormwater BMP Clearinghouse website. If there is a discrepancy between this table and the website, the efficiencies on the website supersede those listed in this table. The TN efficiencies may be found in the bodies of the individual BMP reports.

¹⁵ **NOTE:** There are no Bay Program equivalent efficiency BMPs for Rooftop Disconnection and Rainwater Harvesting. Permittees must use the VA Stormwater Clearinghouse technical criteria and efficiencies to receive credit for these practices.

²Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

APPENDIX V.C - Chesapeake Bay Program, Established Efficiencies

As an alternative to using the Bay Program Curves, permittees may use the Bay Program's established efficiencies for BMPs. Again, these efficiencies may be used for BMPs that do not meet the Virginia Stormwater BMP Clearinghouse design specifications.

Table V.C.1 - Chesapeake Bay Program BMPs, Established Efficiencies

Chesapeake Bay Program BMPs	TN	TP	TSS
Wet Ponds and Wetlands	20%	45%	60%
Dry Detention Ponds and Hydrodynamic Structures	5%	10%	10%
Dry Extended Detention Ponds	20%	20%	60%
Infiltration Practices w/o Sand, Veg.	80%	85%	95%
Infiltration Practices w/ Sand, Veg.	85%	85%	95%
Filtering Practices	40%	60%	80%
Bioretention C/D soils, underdrain	25%	45%	55%
Bioretention A/B soils, underdrain	70%	75%	80%
Bioretention A/B soils, no underdrain	80%	85%	90%
Vegetated Open Channels C/D soils, no underdrain	10%	10%	50%
Vegetated Open Channels A/B soils, no underdrain	45%	45%	70%
Bioswale	70%	75%	80%
Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	10%	20%	55%
Permeable Pavement w/o Sand, Veg. A/B soils, underdrain	45%	50%	70%
Permeable Pavement w/o Sand, Veg. A/B soils, no underdrain	75%	80%	85%
Permeable Pavement w/Sand, Veg. C/D soils, underdrain	20%	20%	55%
Permeable Pavement w/Sand, Veg. A/B soils, underdrain	50%	50%	70%
Permeable Pavement w/Sand, Veg. A/B soils, no underdrain	80%	80%	85%

BMP efficiencies for wetland restoration vary depending on hydrogeomorphic region as listed below in *Table V.C.2*. To use this table the permittee will need to determine which region their MS4 is in and use the appropriate efficiency. If the permittee is unsure which Hydrogeomorphic Region it is located in, resources are available through the USGS at http://chesapeake.usgs.gov/data.html.

Table V.C.2 – Chesapeake Bay Program BMPs, Established Efficiencies Regionally Impacted

Chesapeake Bay Program Hydrogeomorphic Region affected efficiencies				
BMPs	Region		TP	TSS
Wetland Restoration	Appalachian Plateau Siliciclastic Non-Tidal		12%	4.0%
Wetland Restoration	Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	25%	50%	15%
Wetland Restoration	Blue Ridge Non-Tidal; Mesozoic Lowlands Non-Tidal; Valley and Ridge Carbonate Non-Tidal; Piedmont Crystalline Non-Tidal; Piedmont Carbonate Non-Tidal; Valley and Ridge Siliciclastic Non-Tidal	14%	26%	8.0%

Purpose: The purpose of this case analysis is to determine the most effective, efficient, and equitable cost-share program for Best Management Practices in stormwater management for the city of Harrisonburg, Virginia.

Method: The case analysis entailed researching and evaluating existing cost-share programs across other policy arenas in addition to stormwater management along the following criteria.

Criteria	Findings	Recommendations
Eligible BMP Types	 Eligible BMP types varied Most stormwater cost-share programs focused on small scale BMPs like rain barrels and gardens, etc. Retrofits and new builds but never just retrofits 	 Allow flexibility for property owner to choose BMP Generate a short list of BMPs to choose from Allow owner to propose new BMP if they present research on it Allow for retrofits
Applicant Eligibility	 Eligibility was very broad spectrum across all programs Many allowed joint applications if BMP was singular Most restrictive eligibility Land size baseline Income baseline Utility fee baseline 	 Consider utility fee minimum as way to limit eligibility to larger scale property owners Require basic information of BMP plan, load reduction, cost estimates Allow multiple applicant projects for single BMP
Project Selection Criteria	 Some localities prioritized 'targeted areas' for maximizing load reductions, especially nutrient reductions Farm water quality cost share utilized 'cost-effectiveness' criteria Forestry programs used a 'total environmental impact' Some programs had a point system; others took 'first come, first serve' 	Consider the use of 'target areas' or zones to emphasize location and load reduction criteria Use of target zone may reduce need for complex point system and allow for 'first come, first serve'
Financing	 Financing had the most variation between 50% to 90% of total costs (most between 50% and 75%) Municipalities set maximum contributions for specific projects All financing was provided by the individual or business up front, with city reimbursing after project's completion. 	 Financing needs to consider variation across the BMP type, applicant, area, etc. Consider minimums based on difference between utility fee decrease over three years and total cost of the BMP installed Consider property owner ability to pay for equity purposes
BMP Construction & Maintenance Responsibilities	 In almost all cases, construction and maintenance by applicant Forestry programs required landowners to pick from list of contractors Most had maintenance requirements for 10 years after installation Range was 3 to 15 years 	 Allow applicant to choose own contractors Require applicant to conduct maintenance Use waiver before granting cost share that includes repercussions of failed maintenance inspection

Evaluation of Project	 Evaluation after installation of the BMP was performed by the city or county Monitoring timelines contingent upon BMP types Some programs surveyed recipients for post-BMP impacts i.e. cost savings, aesthetics, other certifications (LEED) 	•	The city should evaluate the BMP after its installation to ensure it is in good working order and performing Time frame for ongoing monitoring should vary by BMP Consider 5 year cycles mapped to load reduction requirements	
Additional Incentives	 Some cost-share programs bundled state and federal grants and subsidies Farm water quality cost-share programs linked applicants to low- interest loans 	•	Research additional programs at state and federal levels that applicant may qualify for Assess potential for local financial institutions to provide low-interest loans	
Generic Timeline	Implementation timelines varied between a rolling basis and having strict deadlines	•	Consider mapping timeline to when utility fee bills are issued	

Considerations

- Evaluation of cost-share programs indicates that the following factors are important for successful cost-share programming:
 - Collaborative landowner behaviors
 - o Landowners with greater risk aversion who are more inclined to install a BMP
 - o Benefit/cost balance
 - o Extensive marketing of program to potential applicants
 - o Active communication between implementer and applicant
 - High rates of applicant participation
 - o Written agreements and high levels of transparency
 - o Competitive bidding to get into the program can help with cost-effectiveness

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Houston, J. E., & Sun, H. (1999). Cost-share incentives and best management practices in a pilot water quality program. *Journal of Agricultural and Resource Economics*, 239-252.