# Stormwater Utility Fee Credit Manual for Non-Residential

KEEP IT CLEAN, HARRISONBURG
STOP POLLUTED RUNOFF

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 2015~~XXX**

## Table of Contents



## Appendices

*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.*

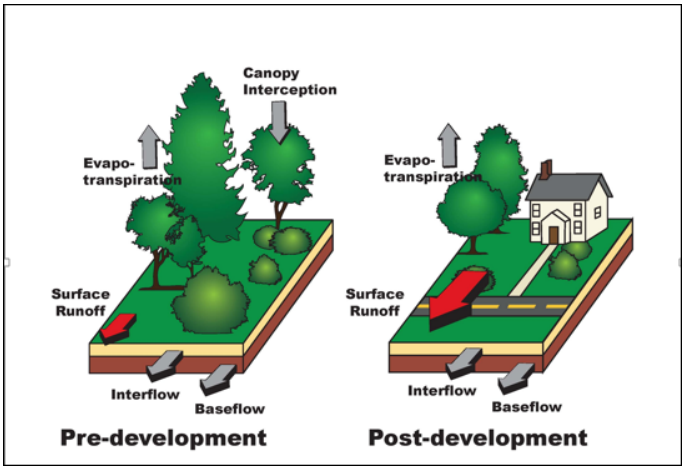
# 1 INTRODUCTION

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:

1. 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

2. 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.

Proposed ***Annual*** Utility Fee Calculation:

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

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

466,200 sf ÷ 500 sf = *932.4 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**

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

932 x $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 (~~4~~3) ~~categories of BMPs~~categories eligible for a credit.

A. Virginia Stormwater Management Program (VSMP) Required 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. VSMP Required On-Site BMPs Providing Water Quantity **AND** 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.

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 prior 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

2. ~~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 Maintenanceve 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

5. 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)

~~—~~Stormwater Utility Fee Calculations

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*

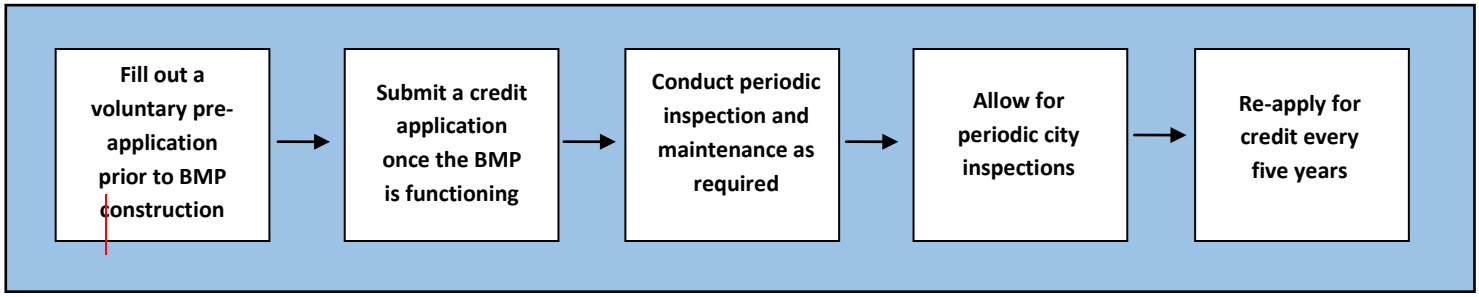
If the applicant is not satisfied with the response of the Public Works Department and/or an application is denied, an appeal may be made to the Stormwater Advisory Committee and Director of Public Works~~-~~. The Stormwater Advisory Committee (SWAC) is comprised of five (5) members and one City Council 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, 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~~45 days of 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.~~

**Table 1. Stormwater Utility Fee Credit – Property Owner Action Plan:**



## 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, c~~C~~omplete~~See~~ 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.

**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 (%) |
|---|---|
| ≤ 5 | 50% |
| 5 < X ≤ 10 | 40% |
| 10 < X ≤ 20 | 30% |
| Greater than 20 | 20% |

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 criteria outlined in Table 2. 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 (%)~~ |
|---|---|
| ~~≤ 5~~ | ~~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. ~~ust meet minimum percentage increase of TP removal as shown in Table 2.~~Voluntary ~~On-Site~~ Water Quality BMPs

If a~~n 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~~the value of 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.

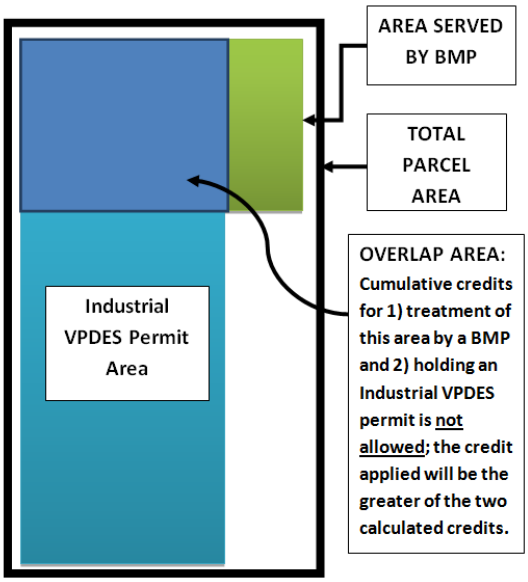
***~~DESIGN CRITERIA~~***

~~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 FOR REGIONAL BMPS***

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)

***NUTRIENT CREDITS PURCHASED OFFSITE***

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. Maintenance activities are required through a BMP Maintenance Agreement. Types of BMP Maintenance Agreements are outlined below.

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 Non-Residential 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 re-application, 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

- ✓ 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.

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.

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)

Chesapeake Bay Program's Urban Stormwater Protocol for Urban Stormwater Retrofit: Final CBP Approved Expert Panel Report on Stormwater Retrofit
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%) x (75%)] x ($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)

***66.7% =*** 40,000 sf ÷ 60,000 sf

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

***% Increase*** = 2.0 ÷ 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%) x (66.7%)] x ($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 voluntarily constructed 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%) x (60%)] x ($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 x 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

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 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 CREDIT APPLICATION FOR NON-RESIDENTIAL

Date Received: _____

Credit Application ID: _____

Original Fee: _____

Credit Amount: _____

Revised with Credit Applied: _____

Percentage of Credit: _____

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

# Stormwater Utility Fee Credit Application Form

**For Non-Residential**

***Submit ONE Application Per BMP***

☐ For Pre-Installation Review

☐ For Final Credit Application

☐ To Reinstate an Expired Credit *(For re-applications of credit 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 Business): _____

Owner Mailing Address (w/ Apartment Unit, if applicable): _____

City: _____ State: _____ Zip Code: _____

If Business, Contact Name (Last, First, M.I.): _____

Phone Number (w/Area Code): (_____)_____ Email: _____

## Type of BMP Installed (check one)

**NOTE:** Stormwater management calculations, original construction plans, record drawings, pollutant removal calculations, and a Maintenance Agreement for the stormwater BMP must be submitted with this credit application.

### ☐ Category A. Required On-Site BMP Providing Water Quantity OR Quality Control to Satisfy 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. Details provided in attached Stormwater Calculations. Yes ☐ No ☐

*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: _____%, equal to the following:**

**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)

### ☐ 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

**I hereby certify the above information to be true and correct to the best of my knowledge. I agree that pollutant credits approved by the City of Harrisonburg as Stormwater Utility Fee Credits will no longer be available for any other use, including Virginia Stormwater Management Program requirements.**

_____
Owner Printed Name

_____ _____
Owner Signature Date

---

**FOR CITY USE ONLY**

Application administratively complete and credit applied ☐ Yes ☐ No

Application Credit denied based on the following: _____

_____

Reviewed by: _____ Date: _____

Property Owner Letter Mailed: ☐ Yes Date: _____

**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 _____ and dated _____, 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

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

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.

WITNESS the following signatures and seals:

_____

_____

_____
Company/Corporation/Partnership Name
By: _____
_____
(Type Name)
_____
(Type Title)

STATE OF _____
CITY/COUNTY OF _____
The foregoing Agreement was acknowledged before me this day _____ of ,_____, _____, by _____.

_____
NOTARY PUBLIC
My Commission Expires: _____
My Commission No. is: _____

Project Name: _____

CITY OF HARRISONBURG, VIRGINIA

By: _____
Kurt D. Hodgen

Its: City Manager

STATE OF _____
CITY/COUNTY OF _____
The foregoing Agreement was acknowledged before me this day ____ of _____, _____, by Kurt D. Hodgen, City Manager.

_____
NOTARY PUBLIC

My Commission Expires: _____
My Commission No. is: _____

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.

1. 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 Virginia Code 9VAC24-870-114 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 Characteristics

Post Development TP Loading (TP Load) _____ lbs TP/yr *From VSMP Calculations*

Allowed Post Development TP Loading (TP Allow) _____ lbs TP/yr *From VSMP Calculations*

## Design Characteristics

Type of BMP Installed _____

Design Guidelines DEQ Clearing House / Bay Program *(Circle One)*

*Enter appropriate removal efficiencies based on design guidelines see attached tables*

Phosphorous Removal Efficiency (TP) _____ *% Use Table V.A.1 DEQ*

Nitrogen Removal Efficiency (TN) _____ *% Use Table V.A.1 DEQ*

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 Reduction**

| | | | | | | |
|---|---|---|---|---|---|---|
| _____ | - | _____ | = | _____ | lbs TP/yr |
| TP Load | | TP Allow | | TP Reduction Required | |
| _____ | X | _____ % | = | _____ | lbs TP/yr |
| TP Load | | TP | | TP Provided | |
| _____ | - | _____ | = | _____ | lbs TP/yr |
| TP Provided | | TP Reduction Required | | **Total TP Removed** | |

**TN & TSS Percentages**

| | | | | |
|---|---|---|---|---|
| _____ | ÷ | _____ | = | _____ |
| TP Allow | | TP Provided | | **TP %** |

**TN Loading**

| | | | | | | |
|---|---|---|---|---|---|---|
| _____ | X | 6.9 | = | _____ | lbs TN/yr |
| TP Load | | TN Ratio | | TN Load | |
| _____ | X | _____ % | = | _____ | lbs TN/yr |
| TN Load | | TN | | TN Removed | |
| _____ | X | _____ | = | _____ | lbs TN/yr |
| TN Removed | | TP % | | **Total TN Removed** | |

**TSS Loading**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | 469.2 | = | _____ | lbs TN/yr |
| TP Load | | TSS Ratio | | TSS Load | |
| _____ | X | _____ % | = | _____ | lbs TN/yr |
| TSS Load | | TSS | | TSS Removed | |
| _____ | X | _____ | = | _____ | lbs TN/yr |
| TSS Removed | | TP % | | **Total TSS Removed** | |

## Summary of Removal

Total Phosphorus Removed = _____ lbs 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 BMPs[14]

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**

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

[1]Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B
[2]Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

[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.

## 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 | TN | TP | TSS |
| Wetland Restoration | Appalachian Plateau Siliciclastic Non-Tidal | 7.0% | 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% |

## **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

## Site Characteristics

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

## Design Characteristics

Existing BMP Type _____
Design Guidelines shall be based on Original Design
*Enter appropriate removal efficiencies based on design guidelines*
Phosphorous Removal Efficiency (TPe) _____ *% Use Table V.A.1 DEQ or Table V.C.1 Bay*
Nitrogen Removal Efficiency (TNe) _____ *% Use Table V.C.1*
Suspended Solids Removal Efficiency (TSSe) _____ *% Use Table V.C.1**
**If BMP is not located in Table V.C.1, see Public Works Staff*

Proposed BMP Type _____
Design Guidelines DEQ Clearing House / Bay Program (Circle One)
*Enter appropriate removal efficiencies based on design guidelines see attached tables*
Phosphorous Removal Efficiency (TPp) _____ *% Use Table V.A.1 DEQ or Table V.C.1 Bay*
Nitrogen Removal Efficiency (TNp) _____ *% Use Table V.A.1 DEQ or Table V.C.1 Bay*
Suspended Solids Removal Efficiency (TSSp) _____ *% 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)*

**Removal Efficiencies**

| | | | | | |
|---|---|---|---|---|---|
| _____ | - | _____ | = | _____ | *Use decimal* |
| TPp | | Tpe | | TP | |
| _____ | - | _____ | = | _____ | *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 | |

**TP Removal**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | _____ | = | _____ | lbs TP/yr |
| IA Load | | TP | | IA Removal | |
| _____ | X | _____ | = | _____ | lbs TP/yr |
| PA Load | | TP | | PA Removal | |

| | | | | | |
|---|---|---|---|---|---|
| _____ | + | _____ | = | _____ | lbs TP/yr |
| IA Removal | | PA Removal | | **Total TP Removed** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **TN Loading** | _____ | X | 16.86 | = | _____ | lbs TN/yr |
| | IA | | TN Loading | | IA Load | |
| | _____ | X | 10.07 | = | _____ | lbs TN/yr |
| | PA | | TN Loading | | PA Load | |
| **TN Removal** | _____ | X | _____ | = | _____ | lbs TN/yr |
| | IA Load | | TN | | IA Removal | |
| | _____ | X | _____ | = | _____ | lbs TN/yr |
| | PA Load | | TN | | PA Removal | |
| | _____ | + | _____ | = | _____ | lbs TN/yr |
| | IA Removal | | PA Removal | | **Total TN Removed** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **TSS Loading** | _____ | X | 1171.32 | = | _____ | lbs TSS/yr |
| | IA | | TSS Loading | | IA Load | |
| | _____ | X | 175.8 | = | _____ | lbs TSS/yr |
| | PA | | TSS Loading | | PA Load | |
| **TSS Removal** | | | | | | |
| | _____ | X | _____ | = | _____ | lbs TSS/yr |
| | IA Load | | TSS | | IA Removal | |
| | _____ | X | _____ | = | _____ | lbs TSS/yr |
| | PA Load | | TSS | | PA Removal | |
| | _____ | + | _____ | = | _____ | lbs TSS/yr |
| | IA Removal | | PA Removal | | **Total TSS Removed** | |

## Summary of Removal

| | | |
|---|---|---|
| | _____ | lbs TP/yr |
| Total Phosphorus Removed = | _____ | lbs TN/yr |
| Total Nitrogen Removed = | _____ | lbs TSS/yr |
| 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 BMPs[14]

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**

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

[1]Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B
[2]Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

[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.

## 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 | TN | TP | TSS |
| Wetland Restoration | Appalachian Plateau Siliciclastic Non-Tidal | 7.0% | 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% |

## **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

## Site Characteristics

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 guidelines see attached tables*
Phosphorous Removal Efficiency (TP) _____ *% Use Table V.A.1 DEQ or Table V.C.1 Bay*
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**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | 1.62 | = | _____ | lbs TP/yr |
| IA | | TP Loading | | IA Load | |
| _____ | X | 0.41 | = | _____ | lbs TP/yr |
| PA | | TP Loading | | PA Load | |

**TP Removal**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | _____ % | = | _____ | lbs TP/yr |
| IA Load | | TP | | IA Removal | |
| _____ | X | _____ % | = | _____ | lbs TP/yr |
| PA Load | | TP | | PA Removal | |
| _____ | + | _____ | = | _____ | lbs TP/yr |
| IA Removal | | PA Removal | | **Total TP Removed** | |

**TN Loading**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | 16.86 | = | _____ | lbs TN/yr |
| IA | | TN Loading | | IA Load | |
| _____ | X | 10.07 | = | _____ | lbs TN/yr |
| PA | | TN Loading | | PA Load | |

**TN Removal**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | _____ % | = | _____ | lbs TN/yr |
| IA Load | | TN | | IA Removal | |
| _____ | X | _____ % | = | _____ | lbs TN/yr |
| PA Load | | TN | | PA Removal | |
| _____ | + | _____ | = | _____ | lbs TN/yr |
| IA Removal | | PA Removal | | **Total TN Removed** | |

**TSS Loading**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | 1171.32 | = | _____ | lbs TSS/yr |
| IA | | TSS Loading | | IA Load | |
| _____ | X | 175.8 | = | _____ | lbs TSS/yr |
| PA | | TSS Loading | | PA Load | |

**TSS Removal**

| | | | | | |
|---|---|---|---|---|---|
| _____ | X | _____ % | = | _____ | lbs TSS/yr |
| IA Load | | TSS | | IA Removal | |
| _____ | X | _____ % | = | _____ | 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/yr

Name of Individual Completing this Form: _____

## APPENDIX V.A – Virginia Stormwater Clearinghouse BMPs[14]

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**

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

[1]Lower rate is for HSG soils C and D; higher rate is for HSG soils A and B
[2]Lower nutrient removal in parentheses apply to wet ponds in coastal plain terrain

[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.

## 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 | TN | TP | TSS |
| Wetland Restoration | Appalachian Plateau Siliciclastic Non-Tidal | 7.0% | 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% |