



# City of Harrisonburg, Virginia

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## MS4 Program Plan

Reporting Period: July 1, 2013 – June 30, 2014

Permit Number: VAR040075

In compliance with the Virginia Stormwater Management Program (VSMP)  
General Permit for Stormwater Discharges from Small Municipal Separate  
Storm Sewer Systems (MS4)



**CERTIFICATION STATEMENT AND SIGNATORY REQUIREMENTS  
FOR MS4 PERMIT APPLICATIONS AND REPORTS**

As required by 9VAC25-870-370 B, all reports required by state permits, and other information requested by the board shall, be signed by a responsible official or by a duly authorized representative of that person. A responsible official is:

1. *For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;*
2. *For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or*
3. *For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.*

A person is a duly authorized representative only if:

1. *The authorization is made in writing by a person described above;*
2. *The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and*
3. *The written authorization is submitted to the department.*

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**CERTIFICATION**

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

   
Responsible Official Signature                      Date

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VAR040075                      City of Harrisonburg, VA  
Permit Number                      MS4 Name



# MS4 Program Plan

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## I. Introduction

The City of Harrisonburg is an independent city located in the Shenandoah Valley of the Commonwealth of Virginia and is surrounded by Rockingham County. The City is an operator of a Small Municipal Separate Storm Sewer System (MS4). A *municipal separate storm sewer* means “a conveyance or system of conveyances otherwise known as a municipal separate storm sewer system, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains:

1. Owned or operated by a federal, state, city, town, county, district, association, or other public body, created by or pursuant to state law, having jurisdiction or delegated authority for erosion and sediment control and stormwater management, or a designated and approved management agency under § 208 of the CWA that discharges to surface waters;
2. Designed or used for collecting or conveying stormwater;
3. That is not a combined sewer; and
4. That is not part of a publicly owned treatment works.”

The US Census in 2010 determined the City’s population to be 48,914, that the City is within an Urbanized Area, and thus subject to the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems, which became effective July 1, 2013 and will expire on June 30, 2018 when a new permit cycle is expected to become effective.

The MS4 Permit requires the City to develop and MS4 Program Plan (this document), and to submit Annual Reports for each period between July 1 through June 30. Modifications to the MS4 Program Plan are expected throughout the life of the permit as part of the iterative process to reduce pollutant loadings and to protect water quality. The City’s MS4 Program Plan and Annual Reports available on the City’s Stormwater webpages: <http://www.harrisonburgva.gov/stormwater-management-program>.

Additional information on the laws and regulations affecting the City and its operation of an MS4 can be found in:

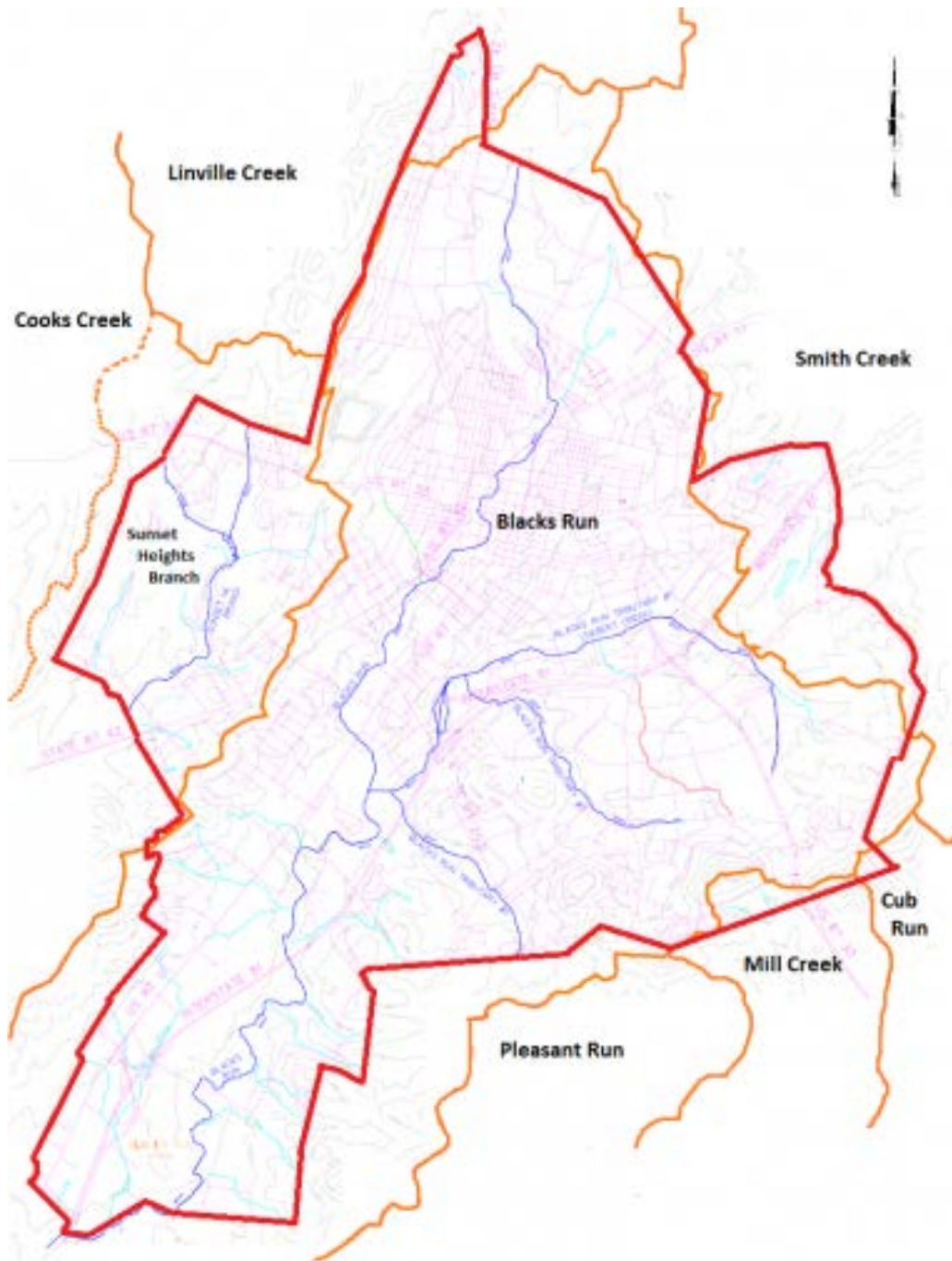
- Virginia Stormwater Management Act, Article 2.3 (§62.1-44.15-24 et seq.) of Chapter 3.1 of Title 62.1 of the Code of Virginia
- Virginia Administrative Code, 9VAC25-870, Virginia Stormwater Management Program (VSMP) Regulations
- Virginia Administrative Code, 9VAC25-890-40, General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems
- Virginia Department of Environmental Quality, Municipal Separate Storm Sewer Systems, <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/MS4Permits.aspx>

## II. Watersheds

The City of Harrisonburg's 17.4 square miles is highly urbanized with substantial amounts of impervious surface. The following table describes approximate stream length, drainage areas, and impairments for each watershed within Harrisonburg city limits.

**Table 1. Subwatersheds in Harrisonburg**

<b><u>Subwatershed Name</u></b>	<b><u>Hydrologic Unit Code (HUC)</u></b>	<b><u>Approximate Length (miles) within Harrisonburg</u></b>	<b><u>Approximate Drainage Area (acres)</u></b>	<b><u>Impairments</u></b>	<b><u>TMDL WLA?</u></b>
<b>Blacks Run</b> ( <i>flows into Cooks Creek</i> )	<b>PS22</b>	<b>8.67</b>	<b>9067</b>	<b>Fecal Coliform, Sediment, Total Phosphorus</b>	<b>No</b>
<b>Sunset Heights Branch of Cooks Creek</b>	<b>PS23</b>	<b>2.09</b>	<b>1347.58</b>	<b>Fecal Coliform, Sediment, Total Phosphorus</b>	<b>No</b>
<b>Dry Fork</b> ( <i>flows into Smith Creek</i> )	<b>PS59</b>	<b>0.206</b>	<b>493</b>	<b>E. Coli, Sediment</b>	<b>Yes, 2004</b>
<b>North River-Mill Creek</b>	<b>PS26</b>	<b>No stream</b>	<b>87.44</b>	<b>E. Coli</b>	<b>No</b>
<b>Cub Run</b> ( <i>flows into South Fork of Shenandoah River</i> )	<b>PS33</b>	<b>No stream</b>	<b>14.75</b>	<b>E. Coli</b>	<b>No</b>
<b>Linville Creek</b> ( <i>flows into North Fork of Shenandoah River</i> )	<b>PS56</b>	<b>0.08</b>	<b>117.8</b>	<b>E. Coli, Sediment</b>	<b>No</b>



**Figure 1. Subwatersheds in Harrisonburg.**

(Red line – Harrisonburg Boundaries; Orange line – Subwatershed Boundaries, Blue line - Streams)

The City of Harrisonburg also drains into the Chesapeake Bay Watershed. The Chesapeake Bay Watershed is 64,000 square miles and includes portions of New York, Pennsylvania, Delaware, Maryland, West Virginia, and Virginia. Altogether, more than 100,000 streams, creeks and rivers make up the Chesapeake Bay Watershed. As part of the Special Conditions for the Chesapeake Bay TMDL, the

MS4 Permit requires the City of Harrisonburg to address impairments for phosphorus, nitrogen, and sediment that enter the Chesapeake Bay.

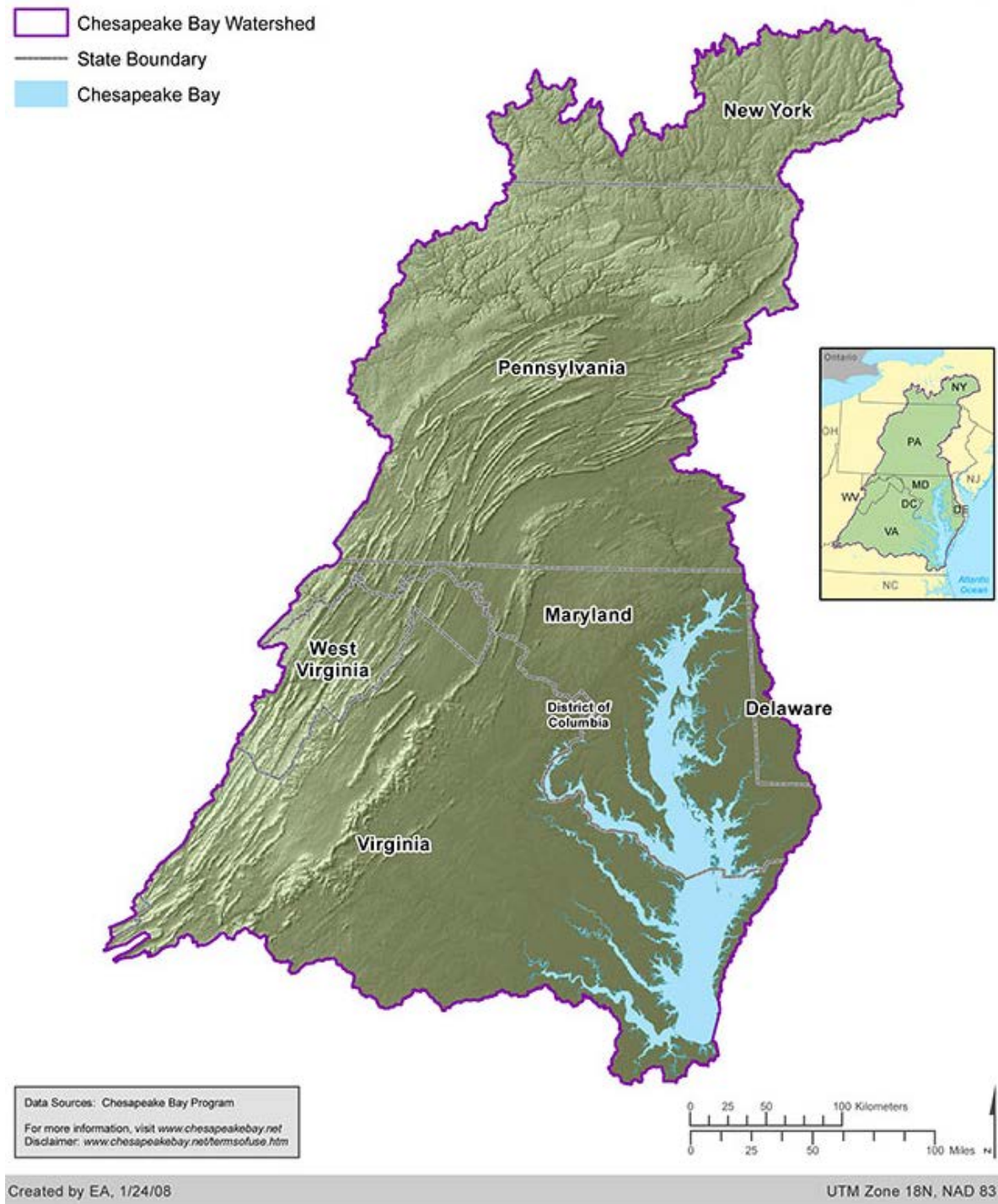


Figure 2. Chesapeake Bay Watershed Map



### III. Organizational Structure

The City of Harrisonburg's Public Works Department coordinates the City's municipal separate storm sewer system (MS4) program. The Public Works Department's MS4 Program Coordinator is responsible for developing and updating the MS4 Program Plan and submitting Annual Reports. The City Manager is responsible for providing the appropriate certification for documents. The Department of Community Development, Department of Public Utilities, the Department of Parks and Recreation, Police Department and Fire Department are the major contributors to Harrisonburg's MS4 Program although it is recognized that this is a citywide and community-wide program.

For MS4 Permit coverage, Harrisonburg City Public Schools (HCPS) and Harrisonburg Electric Commission (HEC) are covered by the City of Harrisonburg's MS4 Permit and their responsibilities are referenced throughout the MS4 Program Plan and associated Annual Reports.

The MS4 Program Plan that follows identifies which city department and title of the staff person(s) responsible for implementing specific best management practices. Asterisk (\*) identify the staff leads for the period July 1, 2014 through June 30, 2015, as applicable.

## IV. Contact Information

<b><u>Principal Executive Officer</u></b>	
Title:	City Manager
Name:	Kurt Hodgen
Address:	345 South Main Street Harrisonburg, Virginia 22801
Phone:	(540) 432-7701
Email:	<a href="mailto:Kurt.Hodgen@harrisonburgva.gov">Kurt.Hodgen@harrisonburgva.gov</a>

<b><u>Duly Authorized Representatives</u></b>	
Title:	MS4 Program Coordinator
Name:	Kelley Junco
Address:	320 East Mosby Road Harrisonburg, Virginia 22801
Phone:	(540) 434-5928
Email:	<a href="mailto:Kelley.Junco@harrisonburgva.gov">Kelley.Junco@harrisonburgva.gov</a>
Title:	Director of Public Works
Name:	James Baker
Address:	320 East Mosby Road Harrisonburg, Virginia 22801
Phone:	(540) 434-5928
Email:	<a href="mailto:Jim.Baker@harrisonburgva.gov">Jim.Baker@harrisonburgva.gov</a>

## V. MS4 Program Plan

The MS4 Program Plan details the City of Harrisonburg's comprehensive program to manage the quality of stormwater runoff discharged from the MS4. This section of the MS4 Program plan is categorized into the following six minimum control measures and special conditions for TMDLs:

1. Public education and outreach on stormwater impacts
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site stormwater runoff control
5. Post-construction runoff control for development and redevelopment
6. Good housekeeping and pollution prevention for municipal operations
7. Virginia TMDL Special Conditions
8. Chesapeake Bay TMDL Special Conditions

This MS4 Program Plan will be reviewed annually and updated as necessary. This MS4 Program Plan will remain on file in the Public Works Department and on Harrisonburg's stormwater webpage:

[www.harrisonburgva.gov/stormwater-management-program](http://www.harrisonburgva.gov/stormwater-management-program).

## Minimum Control Measure #1: Education & Outreach

### **Best Management Practices**

#### **BMP 1.1 Develop and Implement Education and Outreach Program**

**1.1.1 Description:** The City shall continue to implement an education and outreach program as included in the registration statement until the program is updated to meet the conditions of this new permit.

**1.1.2 Goals and Objectives:** The MS4 Permit requires the City of Harrisonburg to design public education and outreach programs with consideration of the following goals:

1. Increasing target audience knowledge about the steps that can be taken to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns.
2. Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications.
3. Implementing a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.

#### **1.1.3 Responsible Departments/Employees:**

##### Public Works Department

*MS4 Program Coordinator\**

*Transportation & Environmental Planning Manager*

*Business Services Manager*

##### Parks & Recreation Department

*Stream Health Coordinator*

##### City Manager's Office

*Public Information Officer*

**1.1.4 Schedule of Implementation:** High-priority issues for education and outreach will be determined 12 months after permit coverage and included in the 2013-2014 MS4 Annual Report. These issues will be evaluated each year. Existing efforts will either be continued or activities for new issues will be developed. The City will use [www.BeHeardHarrisonburg.org](http://www.BeHeardHarrisonburg.org), citizen calls and complaints, and other methods of outreach to help inform our selection of priority issues.

**I: Identification of High-Priority Issues: July 1, 2015-June 30, 2016**

See MS4 Annual Report for July 1, 2013-June 30, 2014

**II: Identification of High-Priority Issues: July 1, 2015-June 30, 2016**

Education & Outreach Topics TBD upon annual evaluations



III: Identification of High-Priority Issues: July 1, 2016-June 30, 2017

Education & Outreach Topics TBD upon annual evaluations

IV: Identification of High-Priority Issues: July 1, 2017-June 30, 2018

Education & Outreach Topics TBD upon annual evaluations

**1.1.5 Annual Reporting Requirements:**

- A list of education and outreach activities conducted during the reporting period for each high-priority water quality issue, the estimated number of people reached, and the estimated percentage of the target audience or audiences that will be reached.
- A list of education and outreach activities that will be conducted during the next reporting period for each high-priority water quality issue, the estimated number of people that will be reached, and the estimated percentage of the target audience or audiences that will be reached.

**Program Plan Requirements:**

- The MS4 Program Plan shall describe how the conditions of the permit shall be updated in accordance with Table 1.

**Permit Cycle Requirement (*five years*):**

- Evaluate the education and outreach program for:
  - Appropriateness of the high-priority stormwater issues;
  - Appropriateness of the selected target audiences for each high-priority stormwater issue;
  - Effectiveness of the messages or messages being delivered; and
  - Effectiveness of the mechanism or mechanisms of delivery employed in reaching target audiences.

**1.1.6 Describe how the Conditions of this Permit shall be Updated in Accordance with Table 1** Since the city was allowed 12 months after permit coverage to develop an Education and Outreach Plan, the plan will be included in the 2013-2014 MS4 Annual Report. Education and outreach initiatives will occur as planned for the 2013-2014 reporting year, but they will not coincide with the Education and Outreach Plan until the 2014-2015 reporting year.

## Minimum Control Measure #2: Public Involvement & Participation

### Best Management Practices

<b>BMP 2.1: Availability of Program Plan and Annual Reports</b>
<p><b>2.1.1 Description:</b> As required, The City of Harrisonburg will review and, as needed, will update the MS4 Program Plan in conjunction with the Annual Report at a minimum of once a year. The City shall solicit public comment of the MS4 Program Plan prior to applying for coverage and shall address how comments were received on the MS4 Program Plan as part of the reapplication package.</p>
<p><b>2.1.2 Goals and Objectives:</b> To solicit public participation and comment through availability of MS4 Program Plan.</p>
<p><b>2.1.3 Responsible Departments/Employees:</b></p> <p><u>Public Works Department</u> MS4 Program Coordinator</p>
<p><b>2.1.4 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>Promote availability of MS4 Program Plan to citizens (posting online, etc): Years 1-5</li> <li>Solicit and receive public comment on MS4 Program Plan prior to applying for coverage: Year 5</li> <li>Update MS4 Program Plan as needed: Years 1-5</li> </ul>
<p><b>2.1.5 Policies and Procedures:</b> The MS4 Program Coordinator is responsible for updating and making available the MS4 Program Plan. The MS4 Program Coordinator will make the City's MS4 Program Plan and Annual Reports available on the City's Stormwater webpage: <a href="http://www.harrisonburgva.gov/stormwater-management-program">http://www.harrisonburgva.gov/stormwater-management-program</a></p> <p>This MS4 Program Plan will be reviewed annually and updated as necessary. The City will receive and document public comments on the MS4 Program Plan as well and address comments, as appropriate, in updates and development of MS4 Program Plan. Prior to applying for coverage for the next permit cycle (2018-2023), the City of Harrisonburg will notify the public and provide for receipt of comment of the proposed MS4 Program Plan that will be submitted with the registration statement.</p>
<p><b>2.1.6 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>The City shall post copies of each MS4 Program Plan on the City website within 30 days of submittal of the Annual Report which is due October 1 of each year.</li> <li>Post copies of each Annual Report to the City website within 30 days of submittal to VA DEQ and retain copies of annual reports online for the duration of this state permit.</li> </ul>

**BMP 2.2: Participate in Four (4) Local Activities Annually**

**2.2.1 Description:** The City of Harrisonburg will participate in four (4) local activities annually. Participation can be through promotion, sponsorship, or other involvement. Information for these activities is tracked and stored in a spreadsheet on the City's network. The four activities planned for the five year permit cycle may vary, below are examples of past events that are likely to continue:

- Blacks Run Clean-Up Day
- Household Hazardous Waste Collection
- 6<sup>th</sup> and/or 7<sup>th</sup> Grade River Field Trips
- Rain Barrel Workshops

**2.2.2 Goals and Objectives:** To increase public participation to reduce stormwater pollutant loads; improve water quality; and support local restoration and clean-up projects, programs, groups, meetings or other opportunities for public involvement.

**2.2.3 Responsible Departments/Employees:**

Responsibilities will vary depending upon the activity. Although others may take the lead to implement an event, the MS4 Program Coordinator will be responsible for ensuring that the City will participate in four (4) local events annually.

Public Works Department

*MS4 Program Coordinator\**

*Transportation & Environmental Planning Manager*

*Business Services Manager*

Parks & Recreation Department

*Stream Health Coordinator*

City Manager's Office

*Public Information Officer*

**2.2.4 Schedule of Implementation:**

- Annually evaluate success of events completed in previous reporting year (Year 1-5)
- Next reporting year, identify four (4) activities in which the City will participate (Year 1-5)

**2.2.5 Procedure for Implementation** – The MS4 Program Coordinator is responsible for ensuring that four (4) activities are identified, and that a responsible lead is identified for each activity.

**2.2.5 Annual Reporting Requirements:**

- Documentation of compliance with the public participation requirements of permit

**Program Plan Requirements:**

- The MS4 Program Plan shall include written procedures for implementing this program.

**2.2.6 Procedures for Implementing this Program** BMP 2.1 and 2.2 will act as the outlined procedures for implementing the City of Harrisonburg Public involvement and participation program.

### Minimum Control Measure #3: Illicit Discharge Detection and Elimination

The permit states that the MS4 Program Plan: “shall include all procedures developed by the operator to detect, identify, and address nonstormwater discharges to the MS4 in accordance with the schedule in Table 1.” Since the City is allowed 12 months after permit coverage to complete this requirement, the Illicit Discharge Detection and Elimination Standard Operating Procedure will be included in the 2013-2014 MS4 Annual Report.

#### **Best Management Practices**

<b>BMP 3.1: Storm Drain System, Outfalls, and Information Map</b>
<b>3.1.1 Description:</b> The City of Harrisonburg will maintain an updated map of the City’s MS4 system mapped by Geographic Information Systems (GIS).
<b>3.1.2 Goals and Objectives:</b> Maintenance and updates of the Storm Drain System Map.
<b>3.1.3 Responsible Departments/Employees:</b>
<p><u>Public Works Department</u>  <i>MS4 Program Coordinator</i>  <i>Systems Analyst*</i>  <i>Transportation &amp; Environmental Planning Manager</i></p> <p><u>Planning &amp; Community Development Department</u>  <i>GIS Coordinator</i>  <i>GIS Technician</i></p>
<p><b>3.1.4 Policies &amp; Procedures:</b>  Storm drain pipes and structures will be mapped and catalogued in the City’s GIS by the Systems Analyst with information provided by Public Works field operations personnel and Planning &amp; Community Development personnel.</p> <p>The storm sewer system map must show the following, at a minimum:</p> <ul style="list-style-type: none"> <li>• The location of all MS4 outfalls. In cases where the outfall is located outside of the MS4 operator's legal responsibility, the operator may elect to map the known point of discharge location closest to the actual outfall. Each mapped outfall must be given a unique identifier, which must be noted on the map; and</li> <li>• The name and location of all waters receiving discharges from the MS4 outfalls and the associated HUC.</li> </ul> <p>The associated information table shall include for each outfall the following:</p> <ul style="list-style-type: none"> <li>• The unique identifier;</li> <li>• The estimated MS4 acreage served;</li> <li>• The name of the receiving surface water and indication as to whether the receiving water is listed</li> </ul>



<p>as impaired in the Virginia 2010 303(d)/305(b) Water Quality Assessment Integrated Report; and</p> <ul style="list-style-type: none"> <li>• The name of any applicable TMDL or TMDLs.</li> </ul>
<p><b>3.1.5 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>• Update City's Storm Drain System Map: Years 1-5</li> <li>• Have complete and updated storm sewer system map and information table: Year 2</li> </ul>
<p><b>3.1.6 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>• None. Data to be made available upon request from VA DEQ.</li> </ul>

<p><b>BMP 3.2 Notification of Regulated Downstream MS4</b></p>
<p><b>3.2.1 Description:</b> The City of Harrisonburg will notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected.</p>
<p><b>3.2.2 Goals and Objectives:</b> To notify downstream regulated MS4s and to be notified from upstream MS4s to assist in identifying the potential source of pollutants should an illicit discharge be found.</p>
<p><b>3.2.3 Responsible Departments/Employees:</b></p> <p><u>Public Works Department</u> MS4 Program Coordinator</p>
<p><b>3.2.4 Implementation Schedule:</b></p> <ul style="list-style-type: none"> <li>• Send written notice to downstream MS4s: Year 1</li> </ul>
<p><b>3.2.5 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>• A list of written notifications of physical interconnection given by City to other MS4s.</li> </ul>

<p><b>BMP 3.3: Illicit Discharges &amp; Connections Ordinance</b></p>
<p><b>3.3.1 Description:</b> The City of Harrisonburg shall effectively prohibit nonstormwater discharges into the storm sewer system using its Illicit Discharges and Connections ordinance. The ordinance can be found in City Code Title 7, Chapter 6 at <a href="http://www.harrisonburgva.gov/code">http://www.harrisonburgva.gov/code</a>.</p>
<p><b>3.3.2 Goals and Objectives:</b> To use Illicit Discharge &amp; Connections ordinance to operate an IDDE program effectively to eliminate non-stormwater discharges to storm sewer system.</p>

**3.3.3 Responsible Departments/Employees:**

Public Works Department  
*MS4 Program Coordinator*

**3.3.4 Schedule of Implementation:**

- Enact ordinance: Year 1
- Utilize ordinance to prohibit nonstormwater discharges to MS4: Years 2-5

**3.3.5 Annual Reporting Requirements:**

- None, unless ordinance is adopted or is amended.

**BMP 3.4: Implement and Update Procedures to Detect & Eliminate Illicit Discharges**

**3.4.1 Description:** The City of Harrisonburg shall implement and update written procedures to detect, identify, and address unauthorized non-stormwater discharges to the MS4.

**3.4.2 Goals and Objectives:** Written procedures utilized shall include:

- Methodologies to collect general information
- Time frame upon which to conduct an investigation
- Methodologies to determine the source of illicit discharge
- Mechanisms to eliminate source of illicit discharges
- Methods for conducting a follow-up investigation
- Mechanism to track all investigations

**3.4.3 Responsible Department/Employees:**

Public Works  
*MS4 Program Coordinator\**  
*Transportation & Environmental Planning Manager*  
*Business Services Manager*

Parks & Recreation Department  
*Stream Health Coordinator*

Planning & Community Development Department  
*GIS Coordinator*  
*GIS Technician*

Public Utilities  
*Public Utilities Engineer*

Fire Department  
Deputy Fire Marshall  
Fire Inspector

**3.4.4 Schedule of Implementation:**

- Utilize written procedures to effectively detect, identify, and address illicit discharges: Years 1-5
- Update written procedures as needed/required: Years 1-5

**3.4.5 Written Procedures:**

**a. Dry Weather Field Screening Methodologies (Outfall Reconnaissance)**

See MS4 Annual Report 2013-2014.

**b. Illicit Discharge Investigation Procedures**

See MS4 Annual Report 2013-2014.

The Departments of Public Utilities and Fire Department have their own processes and procedures for managing sanitary sewer overflows and hazardous chemicals/ materials, respectively, and for reporting information to the VA DEQ. In the event that there is a discharge that enters the city's storm sewer system, Public Utilities and Fire Department will inform the MS4 Program Coordinator.

**3.4.6 Annual Reporting Requirements:**

- Total number of outfalls screened during the reporting period, the screening results, and detail of any follow-up actions necessitated by the screening results.
- A summary of each investigation conducted by the operator of any suspected illicit discharge. The summary must include (i) the date that the suspected discharge was observed, reported, or both, (ii) how the investigation was resolved, including any follow-up, and (iii) resolution of the investigation and the date the investigation was closed.

**BMP 3.5: Outfall Reconnaissance Inventory**

**3.4.1 Description:** The City of Harrisonburg will inspect a minimum of 50 outfalls annually as a part of pollution prevention field screenings.

**3.4.2 Goals and Objectives:** Written procedures utilized shall include:

- Dry weather field screening methodologies
- Schedule of field screening activities
- Minimum number of field screening activities completed annually

**3.4.3 Responsible Department/Employees:**

Public Works  
MS4 Program Coordinator

Parks & Recreation Department  
*Stream Health Coordinator\**

Planning & Community Development Department  
*GIS Coordinator*

**3.4.4 Schedule of Implementation:**

- Conduct dry weather screening inspections annually per permit requirements.

**3.4.6 Annual Reporting Requirements:**

- Total number of outfalls screened during the reporting period, the screening results, and detail of any follow-up actions necessitated by the screening results.

**BMP 3.6: Promotion and Facilitation of Public Reporting of Illicit Discharges**

**3.5.1 Description:** The City of Harrisonburg shall operate and promote an online pollution reporting form for citizens to report illicit discharges. Citizens may also call Public Works Department at 540-434-5928 to report or call 9-1-1 in cases of emergency. <http://www.harrisonburgva.gov/report-pollution>

**3.5.2 Goals and Objectives:** To encourage citizen action in reporting pollution by phone, email, or online reporting form and Public Works phone number. Citizen involvement will assist the City in investigating and eliminating illicit discharges.

**3.5.3 Responsible Department/Employees:**

Public Works Department  
*MS4 Program Coordinator\**

Parks & Recreation Department  
*Stream Health Coordinator*

**3.5.4 Schedule of Implementation:**

- Operate and promote online pollution reporting form: Years 1-5
- Continue fielding pollution reports: Years 1-5

**3.5.5 Annual Reporting Requirements:**

- None.



## Minimum Control Measure #4: Construction Site Stormwater Runoff Control

### Best Management Practices

#### **BMP 4.1: Ordinance and other legal authorities to require Erosion & Sediment Controls**

**4.1.1 Description:** The City of Harrisonburg will implement its ordinance and legal authorities to require erosion and sediment controls on construction sites that disturb 10,000 square feet or greater. Legal authorities include:

- Section 10-4 of the City Code describes the Erosion and Sediment Control Ordinance
- City's Subdivision and Zoning Ordinance
- Design & Construction Standards Manual
- References from above ordinances and documents to the "Virginia Erosion and Sediment Control Regulations" and the Virginia Erosion & Sediment Control Handbook

Additional information about the City's erosion and sediment control program can be found at: <http://www.harrisonburgva.gov/site-development>. (Note: The City of Harrisonburg utilizes an agreement in lieu of a plan for the construction of single-family residences as provided in §62.1-44.15:55.) The City requires that land disturbance not begin until an erosion and sediment control plan or an agreement in lieu of a plan is approved by the City.

**4.1.2 Goals and Objectives:** To prevent degradation of properties, stream channels, waters, and other natural resources.

#### **4.1.3 Responsible Departments/Employees:**

Planning & Community Development Department

*City Engineer (Erosion & Sediment Control Program Administrator)\**

*Civil Engineers*

*Site Development Technician*

#### **4.1.4 Schedule of Implementation:**

- Ordinance was in place prior to July 1, 2013.

#### **Written Plan Review Procedures and all associated documents utilized in plan review:**

- Procedures for Site Plan Review: <http://www.harrisonburgva.gov/site-development>
- Site Plan Review Checklist: <http://www.harrisonburgva.gov/dscsm> (Appendix B)
- Design and Construction Standards Manual: <http://www.harrisonburgva.gov/dscsm> (Chapter 2)
- City Code: Title 10; Chapter 4: Erosion and Sediment Control
- Virginia Erosion and Sediment Control Law
- State Water Control Board; Erosion and Sediment Control Regulations; Chapter 840
- City Code Sections:
  - 10-4-5. Submission and approval of plans; contents of plans
  - 10-4-6. Permits; fees; security for performance

**4.1.6 Written Inspection Procedures and all associated documents utilized during inspection, including the inspection schedule:**

- City Code Section: 10-4-7. Monitoring, reports and inspections
- Erosion & Sediment Control Report, Appendix A
- Erosion & Sediment Control Site Checklist, Appendix D
- ESC & Stormwater Final Inspection Checklist, Appendix D
- VSMP Inspection Checklist, Appendix F

**4.1.7 Written Procedures for Compliance and Enforcement, including a progressive compliance and enforcement strategy, where appropriate:**

See City Code Sections:

- 10-4-8. Penalties, injunctions, and other legal actions
- 10-4-9. Civil violations, summons, generally

**3.5.5 Annual Reporting Requirements:**

- None, unless ordinance or procedures are amended.

**BMP 4.2: Inspections and Tracking of Land Disturbance Activities**

**4.2.1 Description:** City Inspectors will inspect land-disturbing activities for compliance with an approved erosion and sediment control plan or agreement in lieu of a plan in accordance with minimum standards

The inspection schedule for land-disturbing activities will be developed by the Site Development Technician and provided to City Inspectors.

Inspections shall take place (a) upon initial installation of erosion and sediment controls, (b) at least once during every two week period; (c) within 48 hours of any runoff producing storm event; and (d) upon completion of the project and prior to the release of any applicable performance bonds.

The City shall also:

- Utilize legal authority to require compliance with an approved plan when an inspection finds that the approved plan is not being properly implemented.
- Utilize, as appropriate, legal authority to require changes to an approved plan when an inspection finds that the approved plan is inadequate to effectively control soil erosion, sediment deposition, and runoff to prevent the unreasonable degradation of properties, stream channels, waters, and other natural resources.

The City shall ensure that inspections are conducted by personnel who hold a certificate of competence in accordance with 9VAC25-850-40.

**4.2.2 Goals and Objectives:** To prevent degradation of properties, stream channels, waters, and other natural resources.

**4.2.3 Responsible Departments/Employees:**

Planning & Community Development Department  
*City Engineer (Erosion & Sediment Control Program Administrator)*  
*Site Development Technician\**

Public Works Department  
*Public Works Engineer*  
*Chief Construction Inspector\**  
*City Inspectors*  
*Engineer*

**4.2.4 Schedule of Implementation:**

- Conduct Inspections of Land Disturbing Activities: Years 1-5 (City Inspectors and Engineer)
- Track regulated land-disturbing activities: Years 1-5 (Site Development Technician)
- Maintain copies of inspection reports from construction inspections: Years 1-5 (Site Development Technician)
- Maintain documentation of certificates of competence of staff members who conduct erosion and sediment control inspections: Years 1-5 (Site Development Technician)

**4.2.5 Annual Reporting Requirements:**

- Total number of land disturbing activities,
- Total number of acres disturbed,
- Total number of inspections conducted, and
- A summary of enforcement actions taken including total number and type of enforcement actions taken during reporting period.

**BMP 4.3: Mechanism for Receipt of Complaints Regarding Regulated Land Disturbing Activities**

**4.3.1 Description:** The City of Harrisonburg promotes reporting of construction site issues through contact with the public at public outreach & education events as well as through its website at: <http://www.harrisonburgva.gov/site-development> and <http://www.harrisonburgva.gov/report-pollution>. Calls are received by the City and routed to the Chief Construction Inspector.

**4.3.2 Goals and Objectives:** To prevent degradation of properties, stream channels, waters, and other natural resources.

#### **4.3.3 Responsible Departments/Employees:**

##### Planning & Community Development Department

*City Engineer (Erosion & Sediment Control Program Administrator)\**

*Site Development Technician*

##### Public Works Department

*Public Works Engineer*

*Chief Construction Inspector\**

*City Inspectors*

*Engineer*

#### **4.3.4 Schedule of Implementation:**

- Promote and respond to complaints received by the public regarding regulated land disturbing activities: Year 1-5

#### **4.3.5 Annual Reporting Requirements:**

- None.

## **Minimum Control Measure #5: Post-Construction Stormwater Management in New Development & Redevelopment**

### **Best Management Practices**

#### **BMP 5.1: Ordinance and other legal authorities to address Post-Construction Runoff**

**5.1.1 Description:** The City of Harrisonburg will implement its ordinance to address post-construction runoff from new development and redevelopment projects to ensure compliance with the Virginia Stormwater Management Act and attendant regulations. Legal authorities include:

- Section 10-7 of the City Code describes the Stormwater Management Ordinance
- Section 10-2 of the City Code describes the Subdivision Ordinance
- Design & Construction Standards Manual

Additional information about the City's stormwater management program can be found at:

<http://www.harrisonburgva.gov/site-development>.

**5.1.2 Goals and Objectives:** To ensure the general health, safety, and welfare of citizens and to protect the quality and quantity of state waters from potential harm from unmanaged stormwater, including protection from a land disturbing activity causing unreasonable degradation of properties, water quality,

stream channels, and other natural resources.

**5.1.3 Responsible Departments/Employees:**

Planning & Community Development Department

*City Engineer (Stormwater Program Administrator)\**

*Civil Engineers*

*Site Development Technician*

**5.1.4 Written policies and procedures utilized to ensure that stormwater management facilities are designed and installed in accordance with Section II B 5b:**

The City Engineer, with assistance from Planning & Community Development Department staff listed above, is responsible for ensuring that all project plans meet the requirements of the City's Stormwater Management Ordinance.

The following documents outline procedures:

- Procedures for Site Plan Review: <http://www.harrisonburgva.gov/site-development>
- Site Plan Review Checklist: <http://www.harrisonburgva.gov/dcsn> (See Appendix B of DCSM)
- Design and Construction Standards Manual: <http://www.harrisonburgva.gov/dcsn> (Chapter 2)
- Section 10-7 of the City Code describes the Stormwater Management Ordinance
- Section 10-2 of the City Code describes the Subdivision Ordinance
- Virginia Stormwater Management Act
- State Water Control Board; Virginia Stormwater Management Program (VSMP) Regulation; Chapter 870
- Virginia Stormwater Management Handbook
- Department of Environmental Quality Guidance Documents:  
<http://www.deq.virginia.gov/Programs/Water/Laws,Regulations,Guidance/Guidance/StormwaterManagementGuidance.aspx>  
 Virginia Runoff Reduction Method (VRRM) Spreadsheets  
 VSMP Technical Bulletins  
 DEQ Clearinghouse BMP Specifications
- Design & Construction Standards Manual
  - Chapter 2: General Design Standards
  - Appendix B: Site Plan Review Requirements

For privately owned stormwater management facilities the following documents also apply:

- Design & Construction Standards Manual
  - Appendix I: Stormwater Management/ BMP (Best Management Practices) Facilities Maintenance Agreements
  - Appendix J: Stormwater Best Management Practices (BMP) Post-Construction Inspection Policy

**5.1.5 Schedule of Implementation:**

- Adopt an ordinance and implement VSMP program: Year 1
- Implement program: Year 2 – 5

**5.1.6 Annual Reporting Requirements:**

- None, unless ordinance or procedures are amended.

**BMP 5.2: Develop and Implement Written Policies and Procedures to Address Post-Construction Runoff**

**5.2.1 Description:** Develop and implement written policies and procedures to address post-construction runoff from privately owned sites and city owned sites. Procedures should address inspection, operation, and maintenance of stormwater management facilities.

**5.2.2 Goals and Objectives:** To ensure the general health, safety, and welfare of citizens and protect the quality and quantity of state waters from potential harm from unmanaged stormwater, including protection from a land disturbing activity causing unreasonable degradation of properties, water quality, stream channels, and other natural resources.

**5.2.3 Responsible Departments/Employees:**

Planning & Community Development Department  
*City Engineer (Stormwater Program Administrator)\**  
*Site Development Technician*  
*Civil Engineer*

Public Works Department  
*Public Works Engineer\**  
*Chief Construction Inspector*  
*Construction Inspectors*  
*Maintenance Contract Manager*  
*MS4 Program Coordinator*

**5.2.5 Written policies and procedures utilized in conducting inspections during construction:** See documents listed in 5.1.4. During construction, the Chief Construction Inspector and Construction Inspectors are responsible for inspecting stormwater management facilities that are being constructed on both privately-owned and publicly-owned (city-owned) properties. The Site Development Technician is responsible for tracking enforcement.



<p><b>5.2.6 Written procedures for inspection, compliance and enforcement to ensure maintenance is conducted on private stormwater facilities to ensure long-term operation in accordance with approved design:</b> See documents listed in 5.1.4 as well as Appendix F, VSMP Inspection Checklist. After construction is completed, the City Engineer and Planning &amp; Community Development Department staff (listed above) are responsible for ensuring that privately-owned stormwater management facilities are in good working order.</p>
<p><b>5.2.7 Written procedures for inspection and maintenance of operator-owned stormwater management facilities:</b> The City was allowed 12 months after permit coverage to develop operator-owned stormwater management inspection procedures which are described in the 2013-2014 MS4 Annual Report.</p>
<p><b>5.2.8 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>• Develop written policies and procedures: Year 1</li> <li>• Implement written policies and procedures: Year 2-5</li> </ul>
<p><b>5.2.9 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>• None, unless procedures are amended.</li> </ul>

<p><b>BMP 5.3: Require Long-Term O&amp;M of Stormwater Management Facilities Not Owned by the City</b></p>
<p><b>5.3.1 Description:</b> The city shall require adequate long-term operation and maintenance of stormwater management facilities by the owner by requiring the owner to develop a recorded inspection schedule and maintenance agreement.</p> <p>The City provides developers with a template maintenance agreement in the Design and Construction Standards Manual Appendix I and also provides resources such as a BMP Maintenance and Inspection Checklist. Links to these documents are available at <a href="http://www.harrisonburgva.gov/site-development">http://www.harrisonburgva.gov/site-development</a>. The maintenance agreement and the city's Stormwater BMP Post-Construction Inspection Policy (Design &amp; Construction Standards Manual Appendix J) requires that the owner submit to the city an inspection report every five years to assure safe and proper functioning of the facilities. The inspection report must be completed by a professional engineer.</p> <p>Inspection forms for each type of BMP will be those included in the 2013 Virginia Stormwater Management Handbook; Appendix 9E.</p> <p>If maintenance is neglected by the owner, the maintenance agreement allows the city, after property notice is provided, to enter upon the property and take whatever steps necessary to correct deficiencies and charge the costs of such repairs to the owner.</p>
<p><b>5.3.2 Goals and Objectives:</b> To ensure that stormwater management facilities and BMPs are properly functioning as they were designed to control stormwater quantity and quality.</p>

**5.3.3 Responsible Employees:**

Community Development

*City Engineer (Stormwater Program Administrator)\**

*Civil Engineer*

*Site Development Technician*

**5.3.4 Schedule of Implementation:**

- Require owners to develop recorded inspection schedule and maintenance agreements: Year 1
- Implement a schedule to inspect all privately owned stormwater management facilities at least once every 5 years: Year 1

**5.3.5 Annual Reporting Requirements:**

- None, unless procedures are amended.

**BMP 5.4: Require Long-Term O&M of Stormwater Management Facilities Owned by the City**

**5.4.1 Description:** The city shall require adequate long-term operation and maintenance of stormwater management facilities owned by the City. City Inspectors inspect stormwater management facilities annually, generally in the Fall, and inform city departments responsible for the stormwater management facilities of any deficiencies found.

City departments are responsible for maintaining stormwater management facilities on properties they manage unless an alternative agreement with another city department has been established.

**5.4.2 Goals and Objectives:** To ensure that stormwater management facilities and BMPs are properly functioning as they were designed to control stormwater quantity and quality.

**5.4.3 Responsible Departments/Employees:** The following Public Works Department staff are responsible for conducting annual inspections for all city owned stormwater management facilities:

Public Works Department

*Public Works Engineer\**

*Chief Construction Inspector*

*Construction Inspectors*

*Maintenance Contract Manager*

*MS4 Program Coordinator\**

All City Departments that have a stormwater management facility on their properties are responsible for maintenance and repairs. The following list are staff contacts for each department:

Harrisonburg City Public Schools

*Supervisor of Maintenance*

Harrisonburg Electric Commission

*Sub Station Manager*

Parks & Recreation

*Director of Parks & Recreation*

Public Works

*General Supervisor*

*Maintenance Project Manager*

*Storm Sewer Maintenance Crew Member*

**5.4.4 Schedule of Implementation:**

- Maintain list of all known city-owned facilities: Years 1-5
- Inspect city-owned stormwater facilities: Years 1-5

**5.4.5 Annual Reporting Requirements:**

- None, unless procedures are amended.

**BMP 5.5: Track stormwater management facilities**

**5.5.1 Description:** The City shall maintain an updated electronic database of all known operator-owned and privately-owned stormwater management facilities that discharge into the MS4. The database shall include:

- (a) The stormwater management facility type;
- (b) A general description of the facility's location, including the address or latitude or longitude;
- (c) The acres treated by the facility, including total acres, as well as the breakdown of pervious and impervious acres;
- (d) The date the facility was brought online (MM/YYYY). If the date is not known, the City shall use June 30, 2005, as the date brought online for all previously existing stormwater management facilities;
- (e) The sixth order hydrologic unit code (HUC) in which the stormwater management facility is located;
- (f) The name of any impaired water segments within each HUC listed in the 2010 § 305 (b)/ 303 (d) Water Quality Assessment Integrated Report to which the stormwater management facility discharges;
- (g) Whether the stormwater management facility is operator-owned or privately owned;
- (h) Whether a maintenance agreement exists if the stormwater management facility is privately

<p>owned; and</p> <p>(i) The date of the operator's most recent inspection of the stormwater management facility.</p>
<p><b>5.5.2 Goals and Objectives:</b> To ensure that stormwater management facilities and BMPs are properly functioning as they were designed to control stormwater quantity and quality.</p>
<p><b>5.5.3 Responsible Departments/Employees:</b></p> <p>Planning &amp; Community Development Department  Site Development Technician*  City Engineer (Stormwater Program Administrator)</p>
<p><b>5.5.4 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>Track all new stormwater management facilities that require a maintenance agreement: Years 1-5</li> </ul>
<p><b>5.5.5 Annual Report Requirements:</b></p> <ul style="list-style-type: none"> <li>Total number of inspections completed, and when applicable, the number of enforcement actions taken to ensure long-term maintenance.</li> <li>A submittal of an electronic database or spreadsheet of all stormwater management facilities brought online during each reporting year with the appropriate annual report.</li> </ul>

## Minimum Control Measure #6: Pollution Prevention/Good Housekeeping for Municipal Operations

### Best Management Practices

<p><b>BMP 6.1: Develop Written Procedures to Minimize or Prevent Discharges</b></p>
<p><b>6.1.1 Description:</b> The City of Harrisonburg and its departments shall develop and implement written procedures for daily operations designed to minimize or prevent discharges. Procedures shall be written for: daily road, street, and parking lot maintenance, equipment maintenance, and pesticide, herbicide, and fertilizer application, storage and transport of materials.</p>
<p><b>6.1.2 Goals and Objectives:</b> Written procedures for daily operations shall be designed to:</p> <ul style="list-style-type: none"> <li>Prevent illicit discharges</li> <li>Ensure the proper disposal of waste</li> <li>Prevent the discharge of vehicle wash water</li> <li>Require BMPs for discharging water pumped from construction and maintenance activities</li> <li>Minimize pollutant runoff from bulk storage areas</li> <li>Prevent pollutant discharges from municipal automobiles and equipment</li> </ul>

- Ensure application of fertilizers and pesticides is conducted under manufacturer's recommendations

**6.1.3 Responsible Departments/Employees:**

Public Works Department

*MS4 Program Coordinator\**

Harrisonburg Department of Public Transportation

*Facilities Manager*

Procedures will be developed by the Public Works Department in coordination with other department representatives.

**6.1.3 Written Procedures** As Public Works Department staff continues to coordinate with other department representatives on training and the development of Stormwater Pollution Prevention Plans, written procedures will change and improve over time. As of this writing, the City is utilizing BMP Fact Sheet's from US EPA's webpage "Pollution Prevention/ Good Housekeeping for Municipal Operators" as guidance. (See <http://water.epa.gov/polwaste/npdes/swbmp/Pollution-Prevention-Good-Housekeeping-for-Municipal-Operators.cfm>) City staff will continue to develop specific guidance for municipal operations.

**6.1.5 Schedule of Implementation:**

- Develop and implement written procedures for daily operations: Year 1-2
- Update written procedures as needed or required: Years 2-5

**6.1.6 Annual Reporting Requirements:**

- A summary report on the development and implementation of daily operational procedures.

**BMP 6.2: Identify All Municipal High-Priority Facilities and Municipal High-Priority Facilities with a High Potential for Pollutant Discharges**

**6.2.1 Description:** The City of Harrisonburg identified all municipal high-priority facilities and municipal high-priority facilities with a high potential for pollutant discharges during the year 2013-2014. The City shall continue to update this list as new facilities are created or as existing facilities are modified or updated.

**6.2.2 Goals and Objectives:** To identify municipal facilities that may create pollutant discharges to the MS4. This identification process shall allow the City to develop and implement Stormwater Pollution Prevention Plans for these facilities, in order to effectively prevent and eliminate pollutant discharges

from municipal facilities.

### **6.2.3 Responsible Departments/Employees:**

Public Works Department

*MS4 Program Coordinator\**

*Transportation & Environmental Planning Manager*

Facilities will be identified by the Public Works Department in coordination with other department representatives.

### **6.2.4 Schedule of Implementation:**

- Identify High Priority & High Potential Facilities: Year 1
- Update list of High Priority & High Potential Facilities as necessary: Years 2-5

### **6.2.5 Identification of High Priority & High Potential Facilities:**

High priority facilities are defined as facilities that include any of the following:

(i) composting facilities, (ii) equipment storage and maintenance facilities, (iii) materials storage yards, (iv) pesticide storage facilities, (v) public works yards, (vi) recycling facilities, (vii) salt storage facilities, (viii) solid waste handling and transfer facilities, and (ix) vehicle storage and maintenance yards.

High priority facilities with a high potential for discharging pollutants are defined as including any of the following:

- (a) Areas where residuals from using, storing or cleaning machinery or equipment remain and are exposed to stormwater;
- (b) Materials or residuals on the ground or in stormwater inlets from spills or leaks;
- (c) Material handling equipment (except adequately maintained vehicles);
- (d) Materials or products that would be expected to be mobilized in stormwater runoff during loading/unloading or transporting activities (e.g., rock, salt, fill dirt);
- (e) Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants);
- (f) Materials or products that would be expected to be mobilized in stormwater runoff contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;
- (g) Waste material except waste in covered, non-leaking containers (e.g., dumpsters);
- (h) Application or disposal of process wastewater (unless otherwise permitted); or
- (i) Particulate matter or visible deposits of residuals from roof stacks, vents or both not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater runoff.

A list will be provided in the 2013-2014 MS4 Annual Report of the municipal facilities identified as either high priority or high priority with a potential for discharging pollutants by the City of Harrisonburg.

**6.2.6 Annual Reporting Requirements:**

- List of High Priority Facilities
- Report on activities.

**BMP 6.3: SWPPP Development for High Priority-High Potential Facilities**

**6.3.1 Description:** The City of Harrisonburg shall develop and implement site-specific Stormwater Pollution Prevention Plans (SWPPP) for identified high priority facilities with a high potential for discharging pollutants. Any facilities covered under a separate VPDES permit shall be excluded from this requirement. Each SWPPP shall be evaluated and updated as necessary to reflect any discharge, release or spill from the facility. A copy of each SWPPP shall be kept, updated, and utilized as part of staff training.

**6.3.2 Goals and Objectives:** To prevent and eliminate pollutant discharges from municipal facilities that are labeled as high priority with a high potential for discharging pollutants.

Each SWPPP developed shall include:

- A site description including a site map identifying outfalls, direction of flows, existing source controls, and receiving bodies of water.
- A discussion and checklist of potential pollutants and sources.
- A discussion of all potential non-stormwater discharges.
- Written procedures designed to reduce and prevent pollutant discharges.
- A description of the applicable training required.
- Annual site compliance evaluation procedures.
- Inspection and maintenance schedule for site specific source controls.
- The date of each inspection and associated findings.
- Date, material discharged, released or spilled, and quantity discharged for each event that occurs.

**6.3.3 Responsible Departments/Employees:**

Public Works Department

*MS4 Program Coordinator\**

*Transportation & Environmental Planning Manager*

SWPPPs to be developed by the Public Works Department in coordination with other department representatives.

**6.3.4 Schedule of Implementation:**

- Develop and implement SWPPPs for high priority-high potential facilities: Years 2-4
- Update SWPPPs as needed or required: Years 2-5



**6.3.5 Annual Reporting Requirements:**

- A summary report on the development and implementation of the required SWPPPs.

**BMP 6.4: Implement Turf and Landscape Nutrient Management Plans**

**6.4.1 Description:** The City of Harrisonburg shall implement turf and landscape nutrient management plans developed by a certified nutrient management planner on all lands owned or operated by the City where nutrients are applied to a contiguous area greater than one acre.

**6.4.2 Goals and Objectives:** To utilize turf and landscape nutrient management plans to responsibly apply nutrients to municipal properties. Facilities requiring Nutrient Management Plans will be provided in the 2013-2014 MS4 Annual Report.

The City shall track the following information:

- Total acreage of lands where turf and landscape nutrient management plans are required.
- Acreage of lands upon which turf and landscape nutrient management plans have been implemented.

The City shall not apply any deicing agent containing urea or other forms of nitrogen or phosphorous to any parking lots, roads, sidewalks, etc.

**6.4.3 Responsible Departments/Employees:**

Public Works Department

*MS4 Program Coordinator*

Parks & Recreation Department

*Director of Parks & Recreation*

*Athletic Turf Manager\**

Harrisonburg City Public Schools

*Executive Director of Special Projects and School Safety*

*Harrisonburg HS Athletics Director\**

**6.4.4 Schedule of Implementation:**

- Identify all lands owned or operated by the City where nutrients were applied to a contiguous area greater than one acre: Year 1

- Implement turf and landscape nutrient management plans for at least 15% of applicable lands: Year 2
- Implement turf and landscape nutrient management plans for at least 40% of all applicable lands: Year 3
- Implement turf and landscape nutrient management plans for at least 75% of all applicable lands: Year 4
- Implement turf and landscape nutrient management plans for all applicable lands: Year 5

**6.4.5 Annual Reporting Requirements:**

- A summary report on the development and implementation of the turf and landscape nutrient management plans that include:
  - The total acreage of lands where turf and landscape nutrient management plans are required;
  - The acreage of lands upon which turf and landscape nutrient management plans have been implemented; and
- Updated list properties with longitude/latitude if changes.

**BMP 6.5: Implement Employee Training On Written Procedures to Minimize or Prevent Discharges**

**6.5.1 Description:** The City of Harrisonburg shall conduct stormwater training for municipal employees. Training shall be designed specifically for different departments and their duties and daily operations and how those duties and operations relate to stormwater management. The City shall document training activities, employees in attendance, and other applicable information.

**6.5.2 Goals and Objectives:** To train municipal employees on stormwater management and various ways to minimize or prevent pollutant discharges.

Training shall be designed to include the following (responsible employees are listed next to each):

1. Biennial training to field personnel in the recognition and reporting of illicit discharges (MS4 Program Coordinator, Facilities Manager)
2. Biennial training to employees in good housekeeping and pollution prevention practices that are to be employed during road, street, and parking lot maintenance. (MS4 Program Coordinator, Facilities Manager)
3. Biennial training to employees in good housekeeping and pollution prevention practices that are to be employed in and around maintenance and public works facilities. (MS4 Program Coordinator, Facilities Manager)
4. Ensure that employees and contractors who apply pesticides and herbicides are properly trained and certified in accordance with the Virginia Pesticide Control Act. (Street Superintendent, Parks Superintendent)
5. Ensure that plan reviewers, inspectors, program administrators, and construction site operators hold the proper certification as required under Virginia Erosion and Sediment Control Law. (City Engineer, Public Works Engineer, Chief Construction Inspector, Construction Inspectors,

<p>Maintenance Project Coordinator)</p> <ol style="list-style-type: none"> <li>6. Ensure that applicable employees obtain the proper certifications as required by Virginia Erosion and Sediment Control Law. (City Engineer, Public Works Engineer)</li> <li>7. Biennial training to employees in good housekeeping and pollution prevention practices that are to be employed in and around recreational facilities. (Director of Parks &amp; Recreation, Park Superintendent)</li> <li>8. Emergency response employees shall have training in spill response. A summary of training or certification shall be included in Annual Report. (Deputy Fire Chief of Training)</li> <li>9. Keep documentation on each training event including training date, number of employees attended, and the objective of the training event for a period of three years after each event.</li> </ol>
<p><b>6.5.3 Responsible Employees:</b></p> <p><u>Public Works Department</u>  <i>MS4 Program Coordinator*</i>  <i>Public Works Engineer</i>  <i>Chief Construction Inspector</i>  <i>Construction Inspectors</i>  <i>Maintenance Project Coordinator</i>  <i>Street Superintendent</i></p> <p><u>Parks &amp; Recreation Department</u>  <i>Director of Parks &amp; Recreation</i>  <i>Park Superintendent</i></p> <p><u>Planning &amp; Community Development Department</u>  <i>City Engineer</i></p> <p><u>Fire Department</u>  <i>Deputy Fire Chief of Training</i></p> <p><u>Harrisonburg Department of Public Transportation</u>  <i>Facilities Manager</i></p> <p>Training programs are to be developed and implemented in coordination with other applicable department representatives.</p>
<p><b>6.5.4 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>• Implement biennial training events: Years 2-5</li> <li>• Ensure that pesticide and herbicide applicators hold proper certification: Years 2-5</li> <li>• Ensure that plan reviewers, inspectors, program administrators, and construction site operators hold proper certification: Years 2-5</li> <li>• Ensure that applicable employees obtain the proper certifications as required by Virginia Erosion</li> </ul>

<p>and Sediment Control Law: Years 2-5</p> <ul style="list-style-type: none"> <li>• Spill response training for emergency personnel: Years 2-5</li> <li>• Keep documentation of training events: Years 2-5</li> </ul>
<p><b>6.5.5 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>• A summary report of the required training, including a list of training events, the training date, the number of employees who attended the training and the objective of the training.</li> </ul>

<p><b>BMP 6.6: Require Municipal Contractors Use Appropriate Control Measures and Procedures for Stormwater Discharges to the MS4 System</b></p>
<p><b>6.6.1 Description:</b> The City of Harrisonburg shall require that municipal contractors use appropriate control measures and procedures for stormwater discharges to the MS4 system.</p>
<p><b>6.6.2 Goals and Objectives:</b> To reduce or eliminate potential discharges from municipal contractors.</p>
<p><b>6.6.3 Responsible Departments/Employees:</b></p> <p><u>Public Works Department</u>  <i>MS4 Program Coordinator</i>  <i>Transportation &amp; Environmental Planning Manager</i></p> <p><u>Purchasing Department</u>  <i>Procurement Manager</i></p> <p>This BMP will be implemented in coordination with all city departments that manage contracted work and will be included as part of training for appropriate city staff.</p>
<p><b>6.6.4 Schedule of Implementation:</b></p> <ul style="list-style-type: none"> <li>• Develop new contract provisions requiring municipal contractors to use appropriate control measures and procedures for stormwater discharges to the MS4 system: Year 2</li> <li>• Require municipal contractors use control measure and procedures for stormwater discharges: Years 2-5</li> </ul>
<p><b>6.6.5 Annual Reporting Requirements:</b></p> <ul style="list-style-type: none"> <li>• Report on activities to develop procedures.</li> </ul>

## Virginia Total Maximum Daily Load (TMDL) Special Conditions

The City will work on developing the TMDL Action Plan during the first two years (2013-2014 and 2014-2015) of this permit cycle to address pollutants which the City's MS4 has been assigned a wasteload allocation. Refer to

Table 1. Subwatersheds in Harrisonburg.

The TMDL Action Plan will identify the best management practices and interim milestone activities. The TMDL Action Plan will be submitted to the Virginia Department of Environmental Quality with the July 1, 2014 through June 30, 2015 MS4 Annual Report.

In 2004, Virginia Department of Environmental Quality (VA DEQ) and Virginia Department of Conservation & Recreation (DCR) approved the Total Maximum Daily Load (TMDL) study for Blacks Run and Cooks Creek and the TMDL Implementation Plan was approved in 2006. Blacks Run and Cooks Creek's TMDLs do not have wasteload allocations (WLAs) specified to the City of Harrisonburg's MS4 Permit.

Smith Creek's TMDL was completed in 2004. And specifies a 95% reduction in E. coli (from 2.88E+12 cfu/yr for existing conditions to 1.44E+11 cfu/yr) for the City's MS4. The TMDL also specified a 22% reduction in sediment to wasteload allocation of 19,798 lbs/year. Smith Creek's TMDL Implementation Plan was completed in 2009.

North River-Mill Creek's TMDL was approved in 2004, the Linville Creek Watershed's TMDL was approved in 2004, and Cub Run in 2004. There were no wasteload allocated to the City of Harrisonburg's MS4 in those TMDLs; likely due to the small size of the drainage areas within city limits.

### Annual Reporting Requirements:

Once the Local TMDL Action Plan is developed, each subsequent annual report shall include:

- A report on the implementation of the TMDL Action Plans and associated evaluation including the results of any monitoring conducted as part of the evaluation.

## Chesapeake Bay Total Maximum Daily Load (TMDL) Special Conditions

In its Phase I and Phase II Chesapeake Bay TMDL Watershed Implementation Plans (WIP), the Commonwealth committed to a phased approach for MS4s to implement necessary pollutant reductions (phosphorus, nitrogen, and sediment). This permit (2013-2018) requires an implementation of 5% pollutant reductions as specified in the 2010 Phase I WIP.

The City will work on developing the Chesapeake Bay TMDL Action Plan during the first two years of this permit cycle in accordance with the permit requirements. The Chesapeake Bay TMDL Action Plan will be submitted to the Virginia Department of Environmental Quality with the July 1, 2014 through June 30, 2015 MS4 Annual Report.

The City will implement its Chesapeake Bay TMDL Action Plan and submit progress reports in its MS4 Annual Report in accordance with the permit requirements.

Prior to the start of the 2018-2023 permit cycle, as part of the City's reapplication package, the City shall document that sufficient control measures have been implemented to meet the compliance target identified in the MS4 permit and draft a second phase Chesapeake Bay TMDL Action Plan to reduce an additional 35% of pollutants from existing and new sources as described in the permit.

### **Annual Reporting Requirements:**

Once the Chesapeake Bay TMDL Action Plan is developed, each subsequent annual report shall include:

- A list of control measures implemented during the reporting period and cumulative progress towards meeting the compliance targets for nitrogen, phosphorus, and total suspended solids
- A list of control measures, in electronic format provided by the department, that were implemented during the reporting cycle and the estimated reduction achieved by the control. For stormwater management controls, the report shall include information required in Section II B 5 e and whether the existing stormwater management control was retrofitted, and if so, the existing stormwater management control type retrofit used.
- A list of control measures that are expected to be implemented during the next reporting period and the expected progress toward meeting the compliance targets.

## **VI. Appendices**

**Appendix A – ESC Inspection Report**

**Appendix B – ESC Control Site Checklist**

**Appendix C – Inspector Responsibilities**

**Appendix D – ESC Final Inspection Report**

**Appendix E – VSMP Inspection Report**

**Appendix F – Stormwater Post Construction Inspection Manual**



**CITY OF HARRISONBURG**

## EROSION &amp; SEDIMENT CONTROL REPORT

409 S. MAIN ST. - HARRISONBURG, VA 22801

PHONE: (540) 432-7700 FAX: (540) 432-7777



<b>PROJECT INFORMATION</b>	PROJECT NAME	
	INSPECTION DATE	TIME
	INSPECTOR	

**REASON FOR INSPECTION**

- ☐ INSTALLATION OF CONTROLS  
☐ SCHEDULED INSPECTION  
☐ POST RAIN EVENT  
☐ PROJECT COMPLETION  
☐ RE-INSPECTION  
☐ OTHER: \_\_\_\_\_

**ACTION**

- ☐ INSPECTION REPORT  
☐ NOTICE TO COMPLY  
☐ STOP WORK ORDER / REVOKE PERMIT

**REQUIRED CORRECTIVE  
ACTION DEADLINE DATE**

<b>ITEM #1</b>	VIOLATION CODE	<input type="radio"/> INITIAL <input type="radio"/> REPEAT	Description and location of problem/violation. Required or recommended corrective actions. Other Comments
<b>ITEM #2</b>	VIOLATION CODE	<input type="radio"/> INITIAL <input type="radio"/> REPEAT	Description and location of problem/violation. Required or recommended corrective actions. Other Comments
<b>ITEM #3</b>	VIOLATION CODE	<input type="radio"/> INITIAL <input type="radio"/> REPEAT	Description and location of problem/violation. Required or recommended corrective actions. Other Comments
<b>ITEM #4</b>	VIOLATION CODE	<input type="radio"/> INITIAL <input type="radio"/> REPEAT	Description and location of problem/violation. Required or recommended corrective actions. Other Comments

Violation	Brief Description
City-1	Land Disturbance w/o a Permit
City-2	Non-Compliance w/ Approved Plans
City-3	Maintenance/Repair of Controls
City-4	Other
MS-1	Stabilization
MS-2	Stockpiles, Waste & Borrow Areas
MS-3	Permanent Vegetation
MS-4	First Step Measures
MS-5	Earthen Structure Stabilization
MS-6	Trap and Basin Sizing
MS-7	Cut and Fill Slopes
MS-8	Concentrated Runoff
MS-9	Water Seeps
MS-10	Inlet Protection
MS-11	Channel / Outlet Protection
MS-12	Watercourse Construction
MS-13	Temporary Stream Crossing
MS-14	Other Watercourse Regulations
MS-15	Bed and Bank Stabilization
MS-16	Utility Construction
MS-17	Construction Entrance, Tracking
MS-18	Control Removal
MS-19	Downstream & Property Protection

<b>COMMENTS / NOTES</b>	

Violation code refers to applicable regulation found in the most recent publication of the Virginia Erosion and Sediment Control Regulations (4VAC50-30-40), state minimum standards and specifications as found in Chapter 3 of the Virginia Erosion and Sediment Control Handbook, Virginia Stormwater Management Regulations (4VAC3-20) and/or the local ESC/SWM ordinance.

The required corrective action deadline date applies to all violations noted on this report. If listed violation(s) currently constitute non-compliance and/or required corrective actions are not completed by the deadline, a Notice to Comply, Stop Work Order, Revoking Permit, Summons with daily accumulative fines, collecting on bond and/or other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project. Failure of onsite contact to sign form does not preclude the City from further enforcement and/or issuance of code violations.

Notice to Comply violations are subject to a civil penalty which ranges from \$100 to \$1,000 per day. See section 10-4-8 of the City of Harrisonburg's Code of Ordinances.

On Site Contact: \_\_\_\_\_ Inspector: \_\_\_\_\_

Print Name                      Signature                      Signature                      Date

A copy of this report/notice will be provided to the owner and/or land disturbing permit applicant via email, fax or mail if violations are noted and on-site contact is unavailable to receive report/notice.

<b>OFFICE USE</b>	DATE RECEIVED	DATE SENT	TIME SENT	SENT TO: <input type="radio"/> Owner/Developer <input type="radio"/> Permittee <input type="radio"/> RLD	SENT BY: <input type="radio"/> Email <input type="radio"/> Fax <input type="radio"/> Mail	NOTES:

White - File      Yellow - Inspector      Pink - On Site Contact

## APPENDIX B; ESC CONTROL SITE CHECKLIST

### EROSION & SEDIMENT CONTROL SITE CHECKLIST

- City-1 Is disturbance permitted?
- City-2 Is construction in compliance with approved plans?  
Is disturbed area within limits of construction per approved plans?
- City-3 Are control measures being maintained / repaired?  
Are control measures performing as per intended function?
- City-4 Other violations of federal, state and local laws/regulations/ordinances.
- MS-1 Have all denuded areas requiring temporary or permanent stabilization been stabilized?  
Temporary stabilization to areas within 7 days that are not at final grade and will remain dormant for more than 30 days?  
Permanent stabilization to areas within 7 days of reaching final grade or to areas to remain dormant for more than 1 year?
- MS-2 Are soil stockpiles and borrow areas adequately stabilized or protected with sediment trapping measures?
- MS-3 Does permanent vegetation provide adequate stabilization? Is it uniform, mature enough to survive and inhibit erosion?
- MS-4 Have sediment trapping measures been installed in accordance with the specifications of the latest edition of the Virginia Erosion and Sediment Control Handbook and made functional before any upslope land disturbance?  
Has silt fence been entrenched, backfilled and compacted?  
Has construction entrance been excavated? Fabric placed? V-DOT #1 coarse aggregate used (3"stone)?  
Has trap been installed per plans? Overflow lower than embankment? Fabric used at outlet?  
Correct size stone for outlet? (VDOT #3, 357 or 5 stone placed on inner portion, Class 1 riprap on outer portion)  
Has basin been installed per approved plans? Dewatering device installed with correct size orifice and tubing?  
Has spillway been constructed per approved plans?
- MS-5 Have earthen measures or structures been immediately stabilized? Has permanent vegetation been established on measures?
- MS-6 Have sediment traps / basins been installed / sized as per approved plans?
- MS-7 Have cut / fill slopes been constructed as per plans, adequately stabilized and free from erosion?
- MS-8 Is concentrated run-off down cut/fill slopes contained within an adequate channel, flume or watertight slope drain?
- MS-9 Are water seeps from slope faces adequately protected?
- MS-10 Do all operational storm sewer inlets have adequate inlet protection?  
Whether pipe/inlet is active or not, debris/sediment should not be able to get into pipe system.
- MS-11 Are outlets adequately protected with proper outlet protection and/or channel lining?  
Has area been excavated, filter fabric placed and proper size stone used? Is protection correct width / length, 0% slope?
- MS-12 Is in-stream construction conducted using measures to minimize channel damage?
- MS-13 Are temporary crossings of non-erodible material installed where applicable?
- MS-14 Are applicable federal, state & local regulations pertaining to working in or crossing streams being met?
- MS-15 Is necessary re-stabilization of in-stream construction complete?
- MS-16 Are underground utilities being installed in accordance with standards?
- MS-17 Are intersections of construction entrance and of paved or public roads clear of mud and sediment tracking?
- MS-18 Have all temporary control measures that are no longer needed been removed?
- MS-19 Are properties and waterways downstream from development adequately protected from erosion and sediment due to increases in stormwater runoff volume, velocity and peak flow rate?  
Have ditches been installed per plans? Has proper lining been used? Installed correctly? Stapled in place?  
Are control measures in place where needed even if not indicated on plans?

If ...	Then also check if ... is applicable
MS-1	MS-2, MS-3, MS-5, MS-19
MS-2	MS-1, MS-19
MS-3	MS-1, MS-5, MS-15, MS-19
MS-4	MS-8, MS-17, MS-19
MS-5	MS-3, MS-19
MS-6	MS-4, MS-19
MS-7	MS-3, MS-8, MS-19
MS-8	MS-4, MS-7, MS-19
MS-9	MS-7, MS-8, MS-19
MS-10	MS-4, MS-11, MS-19

MS-11	MS-4, MS-5, MS-19
MS-12	MS-13, MS-14, MS-15, MS-19
MS-13	MS-12, MS-14, MS-15, MS-19
MS-14	MS-12, MS-13, MS-19
MS-15	MS-1, MS-3, MS-19
MS-16	MS-1, MS-3, MS-19
MS-17	MS-4, MS-19
MS-18	
MS-19	All others
City-2	All minimum standards
City-3	MS-2, MS-4, MS-5, MS-6, MS-19

Make sure you are familiar with the full language of the minimum standards and not just the brief description listed on the inspection reports.

**INSPECTOR RESPONSIBILITIES**

- Visit site and complete inspection report:
  - During or immediately following initial installation of erosion and sediment controls
  - Once in every two-week period
  - Within 48 hours following any runoff producing storm event
  - Immediately following a complaint
- Ensure initial installation of erosion control measures are completed before any upslope land disturbance.
  - Until MS-4 is satisfied, sites will be need to be inspected once per week
- Ensure that all requirements of the approved ESC plan and Minimum Standards are met.
  - Responsible for all site work including single family dwellings built on site until E&S is finalized.
  - Responsible for monitoring site until the establishment of permanent vegetation.
- Ensure that all ESC measures are repaired, maintained and performing as per their intended function.
- Inspection Reports shall:
  - Be turned in within 48 hours of inspection
  - Include all Project Information (Name, Date, Time, Inspector)
  - Be checked describing "Reason for Inspection"
  - Be checked describing "Action"
  - Include Violation Code with description in enough detail for contractor to understand what needs to be done
  - Mark violation as either "Initial" or "Repeat"
  - Include corrective action deadline date / re-inspection date
  - Include signature of inspector and on-site contact if possible. (please explain issues to on-site contact)

**CITY OF HARRISONBURG****ESC & STORMWATER FINAL INSPECTION CHECKLIST**

409 S. MAIN ST. - HARRISONBURG, VA 22801

PHONE: (540) 432-7700 FAX: (540) 432-7777



PROJECT NAME

INSPECTION DATE

TIME

INSPECTOR

**GENERAL SITE CONDITIONS**

YES NO N/A

1. Has perimeter of project been walked and found to be stabilized and free of erosion? ☐ ☐ ☐
2. Have all areas where concentrated flow enters or leaves project site been accounted for? ☐ ☐ ☐
3. Has a permanent vegetative cover been established on ALL areas not otherwise permanently stabilized?  
(This includes any denuded areas caused by construction and/or construction traffic both on and off-site) ☐ ☐ ☐
4. Is site graded per plans allowing for designed flow for stormwater run-off? ☐ ☐ ☐
5. Have all temporary erosion and sediment control measures been removed? (CE, SF, DV, CD, ST, IP, other) ☐ ☐ ☐
6. Have areas denuded due to the removal of esc measures been permanently stabilized? ☐ ☐ ☐

**DITCHES/DIVERSIONS, PERMANENT**

1. Have all ditches/diversions been constructed per plans? (Proper width, depth, liner, etc.) ☐ ☐ ☐
2. Has matting/blankets been installed per manufacturer specifications? (Layered, edges entrenched, check slots, anchored, etc.) ☐ ☐ ☐
3. Are all ditches/diversions permanently stabilized and free from any signs of erosion? ☐ ☐ ☐
4. Are all ditches/diversions free of sediment and debris? ☐ ☐ ☐

**OUTFALLS**

1. Has outlet protection been installed per plans at all outfalls? (0% slope, excavation depth, liner, stone size, length, width, etc.) ☐ ☐ ☐

**PIPING/STRUCTURES**

1. Are all stormwater pipes and structures (public and private) built per plans and free of sediment and debris? ☐ ☐ ☐

**SLOPES**

1. Are all slopes permanently stabilized and free of any signs of erosion? ☐ ☐ ☐
2. If matting/blankets or other measures were required, have they been installed per manufacturers specifications?  
(Layered, edges entrenched, check slots, anchored properly) ☐ ☐ ☐

**STORMWATER FACILITIES/BMPs**

1. Are stormwater management ponds built per plans? (length, width, depth, embankments, spillway, slopes, etc.) ☐ ☐ ☐
2. Is structure built per plans? (Size, inlet and outlets correct size, trash rack, etc.) ☐ ☐ ☐
3. Are all other BMP's constructed and installed per plans and specifications? ☐ ☐ ☐
4. Are stormwater ponds and/or BMP's free of sediment and debris? ☐ ☐ ☐

**COMMENTS/NOTES**

Inspector: \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

P. Form: ESC and Stormwater Inspection Checklist

**SAMPLE VSMP AUTHORITY CONSTRUCTION GENERAL PERMIT SITE INSPECTION CHECKLIST**

(All section references below are to the Construction GP 9VAC25-880-70 effective 7/1/14)

Project Name: \_\_\_\_\_ Permit Number: \_\_\_\_\_  
 Project Address: \_\_\_\_\_ County/City: \_\_\_\_\_  
 Project Operator: \_\_\_\_\_ Operator Telephone: \_\_\_\_\_  
 Operator Address: \_\_\_\_\_ County/City: \_\_\_\_\_ ZIP: \_\_\_\_\_  
 Inspector Name: \_\_\_\_\_ Inspection Date: \_\_\_\_\_ Time: \_\_\_\_\_

		Yes	No	N/A	Recommended Corrective Action/ Notes
1	Copy of notice of coverage letter posted near main entrance: Part II(C)				
2	Information for public access to electronic format or hard copy of SWPPP posted near main entrance: Part II(D)3				
3	Copy of complete SWPPP available onsite for operators: Part II(A)				
3a	Signed copy of registration statement: Part II(A)1.a				
3b	Copy of permit: Part II(A)1.b				
3c	Copy of notice of coverage letter: Part II(A)1.c				
3d	Narrative description of the nature of construction activity: Part II(A)1.d				
3e	Legible site plan: Part II(A)1.e				
3f	Approved ESC plan, "agreement in lieu of a plan", or ESC plan developed in accordance with department approved annual standards and specifications: Part II(A)2				
3g	Approved SWM plan or SWM plan developed in accordance with department approved annual standards and specifications: Part II(A)3				
3h	Pollution prevention plan: Part II(A)4				
3i	Requirements for discharges to impaired waters, surface waters with an applicable TMDL, exceptional waters (if applicable): Part II(A)5				
3j	Contact information for qualified personnel conducting inspections: Part II(A)6				
3k	SWPPP signed in accordance with Part III K: Part II(A)8				
4	SWPPP is being amended, modified and updated: Part II(B)				
4a	SWPPP clearly identifies the contractor(s) that will implement and maintain each control measure identified in SWPPP: Part II(B)3				
4b	Record of dates when major grading activities occurred: Part II(B)4.a(1)				
4c	SWPPP amendments, modifications, or updates signed in accordance with Part III K: Part II(B)5				
5	SWPPP inspections carried out: Part II(F)				
5a	Inspections conducted at required frequency: Part II(F)2				
5b	Inspection reports summarize findings of inspections including corrective actions: Part II(F)4.a-i				
5c	Inspection reports have date and signature of qualified personnel conducting inspections and the operator or authorized representative: Part II(F)4.j				
5d	Inspection reports retained as part of SWPPP: Part II(F)4				
6	Erosion and sediment controls implemented: Part II(A)2.c				
6a	Volume and velocity of stormwater runoff controlled within site to minimize erosion: Part II(A)2.c(1)				
6b	Stormwater discharges, including peak flow rates and total stormwater volume controlled to minimize erosion at outlets and to minimize downstream channel and stream bank erosion: Part II(A)2.c(2)				
6c	Soil exposed during construction activity minimized: Part II(A)2.c(3)				
6d	Disturbance of steep slopes minimized: Part II(A)2.c(4)				
6e	Natural buffers around surface waters provided and maintained, stormwater directed to vegetated areas to increase sediment removal, and maximizes stormwater infiltration: Part II(A)2.c(6)				
6f	Soil compaction minimized and topsoil preserved: Part II(A)2.c(7)				

6g	Stabilization of disturbed areas initiated immediately whenever any clearing, grading, or excavating, or other land-disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for more than 14 days: Part II(A)2.c(8)				
6h	Outlet structures utilized that withdraw stormwater from the surface when discharging from sediment basins or sediment traps: Part II(A)2.c(9)				
7	Pollution prevention plan implemented: Part II(A)4				
7a	Prevent and respond to leaks, spills and other releases including (i) procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases; and (ii) procedures for reporting leaks, spills, and other releases: Part II(A)4.e(1)				
7b	Prevent discharge of spilled and leaked fuels and chemicals from vehicle fueling and maintenance activities (e.g. providing secondary containment such as spill berms, decks, spill containment pallets, providing cover where appropriate, and having spill kits readily available): Part II(A)4.e(2)				
7c	Prevent discharge of soaps, solvents, detergents, and wash water from construction materials, including the clean-up of stucco, paint, form release oils, and curing compounds (e.g., providing (i) cover (e.g., plastic sheeting or temporary roofs) to prevent contact with stormwater; (ii) collection and proper disposal in a manner to prevent contact with stormwater; and (iii) a similarly effective means designed to prevent discharge of these pollutants): Part II(A)4.e(3)				
7d	Minimize discharge of pollutants from vehicle and equipment washing, wheel wash water and other types of washing (e.g., locating activities away from surface waters and stormwater inlets or conveyance and directing wash waters to sediment basins or traps, using filtration devices such as filter bags or sand filters or using similarly effective controls): Part II(A)4.e(4)				
7e	Direct concrete wash water into a leak-proof container or leak-proof settling basin that is designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wastes. Liquid concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wash waters and shall not be discharged to surface waters: Part II(A)4.e(5)				
7f	Minimize discharge of pollutants from storage, handling, and disposal of construction products, materials and wastes including (i) building products such as asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures; (ii) pesticides, herbicides, insecticides, fertilizers, and landscape materials; and (iii) construction and domestic wastes such as packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, and other trash or building materials: Part II(A)4.e(6)				
7g	Prevent discharge of fuels, oils, and other petroleum products, hazardous or toxic wastes, and sanitary wastes: Part II(A)4.e(7)				
7h	Address any other discharge from the potential pollutant-generating activities not addressed above: Part II(A)4.e(8)				
8	Appears to be impact(s) to receiving waters: Part I(B)6, Part I(D), or Part II(A)2c(2) or (5): {Provide location(s) & description of impact(s).}				

Project Name: \_\_\_\_\_ Permit Number: \_\_\_\_\_  
Project Address: \_\_\_\_\_ County/City: \_\_\_\_\_  
Inspector Name: \_\_\_\_\_ Inspection Date: \_\_\_\_\_ Time: \_\_\_\_\_

Pre-Construction Conference	<input type="checkbox"/>	Building Construction	<input type="checkbox"/>	Construction of SWM Facilities	<input type="checkbox"/>
Clearing & Grubbing	<input type="checkbox"/>	Finish Grading	<input type="checkbox"/>	Maintenance of SWM Facilities	<input type="checkbox"/>
Rough Grading	<input type="checkbox"/>	Final Stabilization	<input type="checkbox"/>	Other:	<input type="checkbox"/>

[illegible]

(2) Note whether or not off-site impacts resulting from the condition observed was evident during the inspection.

The recommended corrective action deadline date applies to all conditions noted on this report unless otherwise noted. If listed condition(s) currently constitute non-compliance and/or corrective actions are not completed by the deadline, other enforcement actions may be issued to the entity responsible for ensuring compliance on the above project.

Report e-mailed to



**SAMPLE VSMP CONSTRUCTION GENERAL PERMIT SITE INSPECTION CHECKLIST**

**Photo documentation**


# STORMWATER POST CONSTRUCTION INSPECTION MANUAL

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## DEPARTMENT OF PARKS & RECREATION

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## **Table of Contents:**

- I. Introduction
- II. City Contact Information
- III. Summary of BMP Operation and Maintenance Tasks and Activities
- IV. Best Management Practices (BMP) Inventory
- V. Periodic Inspection Forms
- VI. Completed Periodic Inspection Forms
- VII. Annual Inspection Forms
- VIII. Completed Annual Inspection Forms

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## Introduction

The information included in this manual is to be used as a reference for your Department's inspections of its Stormwater Management (SWM) facilities (also referred to as Best Management Practices (BMPs)). The manual includes a list of all of the SWM's your department is responsible for and includes the following: the type of SWM, the City ID #, a periodic inspection checklist, and the annual inspection checklist. This information will be used by your department throughout the year as you visit, maintain, and inspect your BMPs.

The periodic inspection checklists that are included in this manual are optional and are not required by the City's Municipal Separate Storm Sewer System (MS4) permit. However, Public Works encourages that your field personnel utilize them as they maintain each of the SWM's listed. These inspection checklists should be completed each time the SWM is maintained. Maintaining a BMP includes emergency maintenance, routine maintenance (grass cutting, weed control, mulching, plant replacement, insect control, winter operations, etc.) and the monitoring of the upstream and downstream areas around the SWM. The completed inspection checklists should be retained in this manual for reference and use by our Stormwater Inspection staff. If during the completion of these checklists any deficiencies are found, they should be reported to the responsible party within your department, and repairs should be scheduled. Following the completion of the BMP repair a subsequent checklist should be completed noting that the previously deficient item has been corrected.

The annual inspection checklist that is included will be used only by the Stormwater Inspection staff (led by Public Works). These inspections will be conducted once a year by Stormwater Inspectors and the results will be provided to both the MS4 Program Coordinator and the responsible person within your department. These checklists have been included in this manual as a reference for you to understand the items our inspectors will be looking at during their inspections.

Any questions concerning the SWM maintenance or inspections listed in this manual should be directed to the MS4 Program Coordinator or your department's assigned responsible person.

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### Parks & Recreation Department's Contact:

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Position:

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Email:



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# Summary of SWM Operations and Maintenance

The following pages include an excerpt from the Virginia Stormwater Management Handbook concerning the operations and maintenance tasks and activities associated with your departments SWM facilities. The information begins at Section 9.5 which is located on the lower half of the first page. This information is provided for your reference, and the entire manual can be found at <http://www.deq.virginia.gov/Programs/Water/LawsRegulationsGuidance/Guidance/StormwaterManagementGuidance.aspx>.

The following are some examples of issues that may arise during the review:

- The system inventory may not be complete or up-to-date.
- Inspection scheduling may need to be revised for more or less frequent inspections for all or only specific types of systems.
- Inspection checklists may need modification.
- Maintenance activities may need to be modified.
- Some systems or system components allowed may need to be deleted based upon experiences.
- Some systems or system components may need to be added based on new techniques or developments.
- Additional equipment may be necessary to perform duties adequately.

#### **9.4. PUBLIC INVOLVEMENT IN THE MAINTENANCE PROGRAM**

Educational outreach programs can improve compliance with maintenance requirements. Local governments should consider providing residential or commercial property managers with BMP inspection training and workshops on how to perform basic maintenance. Table 9.6 above provides a list of typical stakeholders and strategies for involving them in a maintenance program.

A telephone hotline, or a web site with a reporting form, is a good tool for increasing citizen involvement. Using these methods, citizens can notify local program staff about specific maintenance issues or observed violations, request an inspection, or ask technical questions. In response, local programs would have to establish a procedure for addressing these reports or queries quickly. The hotline or web site should be advertised in utility inserts, the government pages of the local telephone phone book, on the municipal web site, and through other communication channels.

#### **9.5. SUMMARY OF BMP OPERATION AND MAINTENANCE TASKS AND ACTIVITIES**

##### **9.5.1. Emergency Maintenance**

Maintenance after floods and other emergencies requires immediate mobilization. The response can include replanting vegetation and repairing damaged structures. Living systems are likely to need at least minor repairs after emergencies. Following an emergency such as a flood, standing water may pose health risks because of mosquitoes or contact pollutants. Mosquito control and blocking access should be considered if this becomes a problem.

Obstructions and debris deposited during storm events should be removed immediately from all installations. Exceptions include debris that provides habitat and does not damage vegetation nor divert currents to, from, or within the BMP. In fact, because of the high quality habitat that can be found in woody debris, careful repositioning rather than complete removal may be desirable. There may be instances where debris is even added. Such locations should be noted so that the debris is not accidentally removed. Educating adjacent property owners about the habitat benefits of certain kinds of debris and vegetation can decrease requests for removal.

Formation of sinkholes or other evidence of subsidence within an BMP footprint or its drainage pathways indicates failure of the BMP. The practice should be repaired as soon as feasible after the first observation, using appropriate engineering techniques (e.g., VDOT IIM228 – *Sinkholes: Guidelines for the Discharge of Stormwater at Sinkholes*; WVDEP, 2004; MDE, 2000; etc.).



*Figure 9.8. BMP Sinkhole Collapse*

### 9.5.2. Routine Debris and Litter Removal

Trash removal is an integral part of BMP maintenance. Generally, a “spring cleanup” is needed to remove trash from all surface BMPs. Subsequently, trash removal is performed as required, based on observations during regular inspections. Special attention should be given to removing floating debris, which can clog the outlet device or riser. Regularly removing debris and litter is well worth the effort and can be expected to help in the following ways:

- Reduces the chance of clogging in outlet structures, trash racks, and other facility components.
- Prevents damage to vegetated areas.
- Reduces mosquito breeding habitats.
- Maintains facility aesthetics.
- Reduces conditions for excessive surface algae.
- Reduces the likelihood of stagnant pool formation.

### 9.5.3. Stability and Erosion Control

The best way to promote soil stability and erosion control is to maintain a healthy ground cover in and around the BMPs. Areas of bare soil quickly erode, potentially clogging the facility with

sediment and threatening its integrity. Therefore, bare areas must be stabilized as quickly as possible. Newly seeded areas should be protected with mulch and/or an erosion control mat that is securely staked. For BMPs that rely on filtration, such as bioretention facilities, it is critical that adjacent soils do not contaminate the selected filter media during or after construction. If the site is not permanently stabilized with vegetation when the filter media is installed, the best design practice is to specify sod or other robust erosion control practices for all slopes in and immediately around the BMP.

Erosion is quite common in or around the inlets and outlets of BMP facilities and should be repaired as soon as possible. Erosion control efforts should also extend to areas immediately downstream of the BMP.

The roots of woody vegetation (e.g., young trees and shrubs) can cause embankments to be unstable. Consistent mowing of the embankment controls stray seedlings that take root. Growth of trees and shrubs further away from the embankment should not pose a threat to the stability of the embankment and can provide important runoff filtering benefits. Trees and shrubs should *not* be planted within maintenance and access areas.

Animal burrows also diminish the structural integrity of an embankment. Muskrats, in particular, burrow tunnels up to 6 inches in diameter. Efforts should be made to control animal burrowing. Burrows should be filled as soon as possible.

Finally, subsidence can result in sinkholes on embankments or basin and channel bottoms. Subsidence is not solely related to karst areas. *The presence of subsidence or sinkholes anywhere within the BMP perimeter or along the treatment train can short-circuit the stormwater management system, and it should always be considered a criterion of BMP failure that must be addressed and corrected.*

#### 9.5.4. Sediment Removal and Disposal

Sediment gradually accumulates in BMPs and must eventually be removed. However, removal intervals vary so dramatically among facilities that no “rules of thumb” are applicable. The required frequency of sediment removal is dependent on many factors, including the following:

- The type of BMP;
- The design storage volume (e.g., if the active and permanent pool storage is oversized for sediment storage);
- The characteristics of the upstream catchment area (e.g., land use; level of imperviousness; upstream construction activities and effectiveness of sediment and erosion control activities); and
- Municipal practices (e.g., winter weather roadway sanding and salting, etc.) in the contributing drainage area.

Before installing a BMP, the designer should estimate the lifetime sediment accumulation that the BMP will have to accommodate. Several time periods may be considered, representing expected changes in land use in the watershed. To estimate sediment accumulation, an estimate

of the long term sediment load from upstream must be calculated (see an example method in **Appendix 9-E** at the end of this chapter). Then an estimate of the BMP's sediment removal efficiency must be determined. The analysis of watershed sediment loss and BMP efficiency can be expedited by using a sediment delivery computer model.

The frequency of sediment removal is then based on the sediment accumulation rate versus the amount of sediment storage volume that is inherently provided in the BMP without affecting treatment efficiency or stormwater storage volume. Again, the frequency of sediment removal is BMP- and site-specific. It could be as often as every 2 years, or as long as 15-25 years. The volume of sediment that must be removed and disposed of each dredging cycle is the volume calculated above multiplied by any density or dewatering factors, as appropriate.

Wet sediment is more difficult and expensive to remove than dry sediment. Ideally, the entire facility can be drained and allowed to dry sufficiently so that heavy equipment can operate on the bottom. Provisions for draining permanent pools should be incorporated in the design of water impoundments, where feasible. Also, low-flow channels and outlets should be included in all BMPs in order to bypass stormwater flow during maintenance. However, in many impoundments periodic rainfall keeps the sediment soft, preventing access by heavy equipment. In these cases, sediment may have to be removed from the shoreline by using backhoes, grade-alls, or similar equipment.

Underground or proprietary BMPs – such as vaults, chambers, and other structures that require accumulated material to be pumped out – require special consideration. For such facilities, inspection and maintenance staff may be required to have confined-space training to satisfy OSHA safety requirements. Also, some types of proprietary devices require more frequent maintenance in order to perform as designed. Maintenance contracts are essential when such BMPs are specified on plans.

At sites where sediment loads are expected to be high, designers should designate a dewatering and storage area on the site. This area must be located outside of the floodplain. If such a disposal area is not set aside, transportation and landfill tipping fees can greatly increase the cost of the BMP's maintenance, especially if disposal of wet sediment is not allowed in the local landfill. If on-site storage is not feasible, sediment can be used elsewhere after dewatering, unless the material was generated from a stormwater hot spot (e.g., a gasoline station). In this case, a Toxicity Characteristic Leachate Procedure (TCLP) or other analysis should be performed on the removed sediment to determine if it meets the criteria of a hazardous waste, which requires special handling and disposal. If the waste is not a hazardous waste and is going to be managed as a solid waste, other testing may be required by a receiving facility.

Sediment removed from a BMP requires proper disposal, which must be carefully planned. Some pump-outs result in a waste material that is composed of both liquids and solids. Wastewater plants usually do not accept wastewater with solids, and sanitary landfills usually do not accept any liquids or saturated sediments. Therefore, sediment removal activities must result in a waste material that meets the various disposal requirements. State waste disposal requirements should be consulted for information pertaining to the exact parameters and acceptable levels for different disposal options. Generally, sediment removed from BMPs will not be contaminated to

the point that it would be classified as hazardous waste. However, all sediment removed from BMPs should be tested to determine the proper disposal option. Most private laboratories are familiar with waste disposal regulations and can test sediment samples with these in mind. Generally, there are three sediment disposal options:

- **On-Site Disposal.** On-site disposal allows the sediment to be disposed of on any land area that is not regulated (i.e., land other than floodplain, etc.). During the site planning process, when determining land requirements for stormwater control measures, land can be set aside for on-site disposal of sediment removed from the various BMPs during maintenance. The areas that are used for sediment disposal should be landscaped after each sediment removal operation, in order to stabilize the soil and provide a natural appearance.
- **Off-Site Disposal.** Off-site disposal is often preferred by developers and municipalities. Off-site disposal does not reduce the developable area, landscaping/grading does not have to be performed, and there are no perceived liability/health concerns with respect to the surrounding landowners. Off-site disposal can mean disposal at a sanitary landfill or disposal at another area undergoing filling. The decision of where the material is deposited depends on the quality of the sediments and the availability of and distance to the alternative fill areas.

Temporary disposal areas are recommended for surface end-of-pipe stormwater management facilities – particularly those that do not have a maintenance by-pass – since this provides a location for the sediment to dry before transporting it off-site. Where temporary sediment disposal areas (i.e., drying areas) are not feasible due to limited availability of land or high cost, the means of dealing with the un-dewatered sediment should be detailed in the SWM plan and maintenance agreement, which must be approved by the municipality.

- **Hazardous Waste Disposal.** Although sediment removed from BMPs is expected to contain contaminants (metals, bacteria, nutrients), the levels of pollutants involved are typically not sufficient for it to be classified as hazardous waste. Hazardous waste must be deposited at a hazardous waste facility. Transportation costs and disposal fees are expensive for hazardous waste, since licensed haulers must be used to transport the material and the number of accessible hazardous waste receiving facilities may be limited in number or distance.

#### 9.5.5. Maintenance of Mechanical Components

Each type of BMP may have mechanical components that need periodic attention. For example, valves, sluice gates, fence gates, locks, and access hatches must be functional at all times. The routine inspection, exercising, and preventive maintenance for such mechanical components should be included on a routine inspection/maintenance checklist.

#### 9.5.6. Vegetation Maintenance

Vegetation maintenance is an important component of any stormwater maintenance program. The grasses and plants in all BMPs require regular attention, but particularly in vegetative BMPs such as filter strips, dry and wet swales, grass channels, restored riparian buffers, bioretention facilities, and constructed stormwater wetlands. The development of distressed vegetation, bare

spots, and rills indicates that a BMP is not functioning properly. Problems can have many sources, such as the following:

- Excessive sediment accumulation, which can clog the soil pores and produces anaerobic conditions.
- Nutrient deficiencies or imbalances, including pH and potassium.
- Water-logged conditions caused by reduced soil drainage or a high seasonal water table.
- Invasive weeds.

The soil in vegetated areas should be tested every other year and adjustments made to sustain vigorous plant growth with deep, well-developed root systems. Soil aeration is recommended for filter strips and grassed swales where sediment accumulation rates are high. Ideally, vegetative cover should be mown infrequently, providing for the development of thick stands of tall grass and other vegetation. Also, trampling of vegetation by pedestrian traffic should be prevented.

Areas immediately upstream and downstream of some BMP plantings often experience increased erosion. Although properly designed, located, and transitioned installations experience this effect to only a minor degree, all erosion should be repaired immediately to prevent spreading. Live stakes, live fascines, and other soil bioengineering techniques, possibly in combination with 3-D geotextiles, can be applied to erosion in natural drainage ways with minor grading.

**Table 9.12** below describes some of the vegetation-specific maintenance activities at various types of BMPs. It is important to note that there are specific requirements related to certain management practices that *must* be followed, such as those performed within buffers. In addition, vegetation should be removed if it poses threats to human safety, buildings, fences, and other important structures. Finally, vegetation maintenance activities naturally change as the vegetation matures after construction.

#### **9.5.6.1 Grass Cutting**

Generally, grass-cutting should be limited or eliminated around SWM facilities. Allowing grass to grow tends to enhance water quality and provide other benefits for wet facilities. Short grass around a wet stormwater facility provides an ideal habitat for nuisance species such as geese. Allowing the grass to grow is an effective means of discouraging geese. Grass cutting is one maintenance activity that is undertaken solely to enhance the perceived aesthetics of the facility. The frequency of grass cutting depends on surrounding land uses, local municipal or HOA by-laws, and public or peer pressure. In view of the various influences, grass cutting should be done as infrequently as possible but with sensitivity to the aesthetic concerns of nearby residents.

Grass around wet facilities should not be cut to the edge of the permanent pool. As a safety precaution, cutting should be done parallel to the shoreline with grass clippings being ejected upland, in order to avoid adding organic matter to the pond.



**Table 9.11. Vegetation Maintenance for BMPs**

ACTIVITY	INSTRUCTIONS
<b>Replacement of Dead Plants</b>	All dead plants should be removed and disposed of. Before vegetation that has failed on a large scale is replaced, the cause of the failure should be investigated. If the cause can be determined, it should be eliminated before vegetation is replaced.
<b>Fertilization</b>	The objective of fertilizing at a BMP is to secure optimum vegetative growth, rather than yield (often the objective with other activities such as farming). Infertile soils should be amended before installation and then fertilized periodically thereafter. Fertilizer can be composed of minerals, organic matter (manure), compost, green crops, or other materials.
<b>Irrigation/ Watering</b>	Watering vegetation is usually necessary during the germination period, as well as occasionally thereafter to preserve the vegetation through drought conditions. This can typically be accomplished by pumping water the BMP pool or from the stream, installing a permanent irrigation system or frost-proof hose bib, or using portable water trucks.
<b>Mulching</b>	Mulch should be used to maintain soil temperature and moisture, as well as to improve site aesthetics. A 1/2-inch layer is typically adequate. Ideally, mulch should be removed before winter to prevent an infestation of rodents.
<b>Weeding</b>	Weeding is often necessary in the first growing season, particularly if herbaceous grasses are out-competing the young woody vegetation. The need for weeding may be largely eliminated by minimizing the amount of seed used for temporary erosion control. Weeding may also be required if, over time, invasive or undesirable species are entering the site and out-competing plants that are specifically desired for the treatment of the stormwater.
<b>Cultivating/ Hoeing</b>	Hoeing is often required to loosen overly-compacted soil and eliminate weeds that compete with the desirable vegetation.
<b>Pruning</b>	Pruning is used to trim plants to a desired shape and remove dead wood. Pruning can force single-shoot shrubs and trees to assume a bushier configuration.
<b>Thinning</b>	Thinning dense brush may be necessary for particular species to thrive, to increase the vigor of individual specimens, to reduce flow obstructions, and to increase the ability of maintenance staff to access the entire BMP. Tall maturing trees typically have no place in a BMP (except for buffers) and should be removed as soon as possible.
<b>Staking</b>	Saplings of tall trees planted in or near the BMP may require staking. Care should be taken not to damage the tree's roots or trunk with stakes or ties. Stakes should be kept in place for 6-18 months, and the condition of the stakes and ties should be checked periodically.
<b>Wound Dressing</b>	Broken or damaged branches and other wounds on trees should be dressed in accordance with recommendations from a trained arborist.
<b>Disease Control</b>	Based on monitoring observations, either insecticides or (preferably) organic means of pest and fungal control should be used.
<b>Protection from Animals and Human Foot Traffic</b>	Fencing and signage should be installed to deter pedestrians and to prevent damage due to trampling. These measures are often most necessary during the early phases of installation but may be required at any time. Measures for controlling human foot traffic include signs, fencing, floating log barriers, impenetrable vegetation, ditches, paths, and piled brush. Wildlife damage is caused by the animals browsing, grazing, and rubbing the plants. However, the use of chemical wildlife repellents should be avoided. Fences and meshes can be used to deter entry to the BMP. Tree tubes can be used to prevent damage to individual specimens.
<b>Mowing</b>	Mowing of perennial herbaceous grasses and wildflowers, especially once seed heads have set, promotes redistribution of seed for this self-sustaining system. However, mowing should be carefully controlled, especially when performed for aesthetics. As adjacent property owners and citizens in general learn more about BMPs, their vision of what is aesthetically pleasing can change. Grasses associated with BMPs, in healthy herbaceous stands, should never be mown more than once each year.

### 9.5.6.2 Weed Control

Weeds are generally defined as any kind of vegetation which is unwanted in a particular area. In terms of BMPs, weeds are generally invasive species which cannot provide the intended function of the planting strategy, or other non-native species such as purple loosestrife, the spread of which is undesirable. Local weed control rules should be consulted for local requirements. Weed control may be required annually.

Ideally, weeding should be done by hand to prevent the destruction of surrounding vegetation. The use of herbicides and insecticides, which cause water quality problems, should be prohibited near BMPs. The use of fertilizer should also be limited to minimize nutrient loadings to the downstream receiving waters.

### 9.5.7 Plantings

Upland and flood fringe plantings are generally stable and should not need much maintenance or re-establishment. Shoreline fringe areas are subject to harsher conditions as a result of the frequent wetting and drying associated with this zone. Aquatic plantings are the hardest to establish initially. Typically, vegetation in the aquatic and shoreline fringe zones will require some replanting or enhancement during the first two years of SWM facility operation. Preliminary results of studies of stormwater plantings indicate that a healthy vegetative community will establish if proper conditions are created (although the final set of species may not be those that were originally planted).

Planting methods can be separated into the following three main categories (from terrestrial to aquatic), based on the wetness level and types of vegetation that will grow in these conditions:

- **Upland/Flood Fringe.** The two types of plantings used are herbaceous (ground covers and grasses) and woody vegetation (shrubs and trees). Planting should occur in the spring after groundwater levels have normalized. Ground cover can be installed either by hydroseeding or using a custom seed mix in a nutrient rich medium impregnated in a biodegradable mesh-like blanket. Individual shrubs and trees can be planted manually, with openings made in the mesh blanket for each individual plant, if necessary.
- **Shoreline Fringe (Wet Riparian).** Shoreline fringe vegetation should be planted in mid-May to early June but after water levels have subsided to a stable level. Some form of protection of the seed mixture and soil nutrient medium (if required) should be provided in this dynamic zone of water level fluctuation. In order to establish ground cover in this zone, the biodegradable mesh-like blanket suggested for the upland zone is also highly recommended for this zone. Shrubs and trees can be planted through openings created in the mesh blanket.
- **Aquatic Fringe/Shallow Water.** The establishment of plantings in this zone will require greater material handling and growth monitoring, both in the short-term and over the long-term. Emergent vegetation is easily planted by hand if the substrate is suitable (e.g., ideally, a firm substrate with at least 10% organics by volume). Young shoots (rather than rhizomes or corms) are preferable for planting, since these plants are already growing with an established root structure (for early stability). The plants should be at least 10 cm tall, and planting should occur from late May to early June. Sprigs or plugs are preferable for planting emergent plants, since the root material is already contained in a suitable growth medium.

Mature growth should be planted to establish submerged rooted plants (including pondweeds), if planted in late spring to early summer when the mature plants can take

advantage of warmer water and sunlight penetration. Plantings in early spring or fall should use vegetative propagules such as turions or rhizome plugs, which can germinate in the spring or over the winter and begin growing in the following growing season.

#### **9.5.8 Maintenance of the Aquatic Environment**

An important yet often overlooked aspect of non-routine maintenance of BMPs that have a permanent pool of water is the need to regularly monitor and maintain conditions that promote a healthy aquatic environment. An indicator of excess nutrients (a common problem) is excessive algae growth in the permanent pool of water. In most cases, such problems can be addressed by encouraging the growth of more desirable aquatic and semi-aquatic vegetation in and around the permanent pool. The plants selected should be tolerant of varying water levels and have a high capacity to incorporate the specific nutrients associated with the problem. If algae proliferation is not addressed, algae-laden water will be washed downstream during rain events and may contribute to nuisance odors and pollution stresses in downstream aquatic habitat.

#### **9.5.9 Insect Control**

Ponded water can function as a breeding site for mosquitoes and other insects. Mosquito problems can be minimized through proper design and maintenance. The most effective control technique for prevention of mosquito breeding is to ensure that permanent impoundments do not develop stagnant areas. BMPs with permanent pools should include a source of steady dry-weather flow. Promptly removing floatable debris from the drainage path helps eliminate areas where water can collect and then stagnate. In larger basins, fish that feed on mosquito larvae can be stocked. Additionally, splash aerators can be employed to prevent stagnant water. However, aerators require electricity at the site, increases maintenance costs, and must be designed so as to not decrease the settling efficiency of the BMP.

#### **9.5.10 Winter Operation**

Infiltration facilities are subject to reductions in capacity due to freezing or saturation of the soil. Surface filters and bioretention areas are generally subject to similar problems. Subsurface filters, while less susceptible than surface filters, may demonstrate poorer performance in the winter due to freezing in underdrain pipes or the filter medium. Filters which use organic media are particularly prone to freezing because they retain water.

There is also an increased likelihood of infiltration facilities and filters clogging during winter operation due to the high sediment loads resulting from road maintenance activities (e.g., sanding and salting). Furthermore, there is an increased risk of groundwater contamination from road salt associated with winter operation of infiltration facilities that receive road runoff.

Where filters and infiltration systems are part of a treatment train, runoff that may be diverted in the winter to by-pass these BMPs but will still pass through some type of downstream controls.

### 9.5.11 Maintenance of Other Project Features

All other devices and features associated with BMPs should be monitored and maintained appropriately. These additional items could affect the safety or aesthetics of the facility, which can be as important as (if not more important than) the operational efficiency of the facility. Such items might include:

- Fences
- Access roads
- Trails
- Lighting
- Signage (e.g. no trespassing, emergency notification contact information, etc.)
- Nest boxes
- Platforms
- Watering systems

### 9.5.12 Monitoring

Stormwater monitoring is typically conducted at two levels:

- ***Watershed and Subwatershed Monitoring.*** As noted previously, stormwater is best managed within the context of a watershed and subwatershed plan. These plans will normally contain a monitoring component to track implementation of the plan. The monitoring program will typically include administrative monitoring, water chemistry, biological monitoring, flow and erosion monitoring. These monitoring programs are essential to the success of the Plan. Subwatershed monitoring will normally be conducted or administered by the local conservation authority or municipality.
- ***Facility Monitoring.*** The consensus of opinion among practitioners is that monitoring for chemistry or biotic parameters cannot be justified for each individual facility, because to have any scientific validity a large and costly sampling program is required. The approaches generally used are (1) physical operation monitoring by the owner or municipality to verify that the facility is operating as designed, and/or (2) detailed monitoring of a typical installation through a research program to evaluate design and performance issues. The designer is advised to consult with authorities regarding site-specific requirements, because some jurisdictions have additional monitoring requirements.

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# BMP Inventory

- I. Community Activities Center, BMP ID# 6
- II. Community Activities Center, BMP ID# 16
- III. Dream Come True Playground, BMP ID# 1
- IV. Simms School, BMP ID# 50

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# CITY OF HARRISONBURG

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT  
409 S. MAIN ST., HARRISONBURG, VA 22801  
OFFICE: (540) 432-7700 FAX: (540) 432-7777

## BMP MAINTENANCE PROGRAM REPORT

### PROJECT/FACILITY INFORMATION

PROJECT/FACILITY NAME	Community Activities Center
CLOSEST ADDRESS	305 Dogwood Drive
PROJECT TYPE	Municipal
TM	36 P 1
PLAN APPROVAL	8/8/1991
LD PERMIT	
AGREEMENT REFERENCE	None



### BMP ID# 6

BMP TYPE	UNIT CODE/WATERSHED
3.08 Detention Basin	PS22 - Blacks Run
	ACRES TREATED
	2



NOTES



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DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT  
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## BMP MAINTENANCE PROGRAM REPORT

### PROJECT/FACILITY INFORMATION

PROJECT/FACILITY NAME	Community Activities Center
CLOSEST ADDRESS	305 Dogwood Drive
PROJECT TYPE	Municipal
TM	36 P 1
PLAN APPROVAL	
LD PERMIT	
AGREEMENT REFERENCE	None



### BMP ID# 16

BMP TYPE	UNIT CODE/WATERSHED
3.11 Bio-Retention	PS22 - Blacks Run
Rain Garden	ACRES TREATED
	0.5



NOTES

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## BMP MAINTENANCE PROGRAM REPORT

### PROJECT/FACILITY INFORMATION

PROJECT/FACILITY NAME  
Dream Come True Playground

CLOSEST ADDRESS  
1950 Thomas Bowers Circle

PROJECT TYPE  
Municipal

TM  
87 G 2

PLAN APPROVAL

LD PERMIT  
10/24/2007

AGREEMENT REFERENCE  
None



### BMP ID# 1

BMP TYPE  
3.07 Extended Detention Basin

UNIT CODE/WATERSHED  
PS22 - Blacks Run

ACRES TREATED  
3



NOTES



# CITY OF HARRISONBURG

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT  
409 S. MAIN ST., HARRISONBURG, VA 22801  
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## BMP MAINTENANCE PROGRAM REPORT

### PROJECT/FACILITY INFORMATION

PROJECT/FACILITY NAME	Simms School
CLOSEST ADDRESS	299 E. Washington St.
PROJECT TYPE	Municipal
TM	33 E 10
PLAN APPROVAL	10/20/2003
LD PERMIT	
AGREEMENT REFERENCE	



### BMP ID# 50

BMP TYPE	3.08 Detention Basin	UNIT CODE/WATERSHED	PS22 - Blacks Run
		ACRES TREATED	2



NOTES
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# Periodic Inspections

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## Bioretention / Wetlands / Filtration / Infiltration MONTHLY MAINTENANCE INSPECTION CHECKLIST

Facility Name: \_\_\_\_\_

Location: \_\_\_\_\_

Today's Date: \_\_\_\_\_

Approximate Date of Last Rain Event: \_\_\_\_\_

Inspector's Name: \_\_\_\_\_

*Please provide keep hard copy of this report in the Stormwater Management Handbook for reference and use by Public Works.*

### Problem Severity Key

0 = Good condition. Well maintained, no action required.

1 = Moderate condition. Adequately maintained, routine maintenance needed.

2 = Degraded condition. Poorly maintained, routine maintenance and repair needed.

3 = Serious condition. Immediate need for repair or replacement.

N/A = Not applicable

**\*Write down maintenance needed for any problem ranked 1 or higher.**

### Monthly Tasks

Element	Potential Problem	Problem Severity	How to Fix? (circle all that apply)	Problem Corrected? (initials)	Follow-Up Needed (Yes/No)
Contributing Drainage Area	Excessive trash/debris/sediment		Remove from drainage area.		
	Excessive landscape waste		Remove from drainage area.		
Pre-Treatment Area	Excessive trash/debris/sediment		Remove from pre-treatment area and away from site.		
	Grass filter strip needs mowing.		Keep grass at a height of 4" to 9". Remove grass clippings away from site.		
	Evidence of clogging: standing water, algae, etc.		Remove debris/trash/sediment.		
			Ensure water can flow into main ponding area of BMP.		
Inlets	Trash/debris/sediment		Clear debris and remove from site to ensure that water flows into BMP.		
	Inflow hindered by soil height, build up of sediment and/or grass		Modify inflow points to ensure positive drainage into BMP.		
Infiltration Area	Excessive trash / debris / sediment		Remove from site.		

## Monthly Tasks

<i>Element</i>	<i>Potential Problem</i>	<i>Problem Severity</i>	<i>How to Fix? (circle all that apply)</i>	<i>Problem Corrected? (initials)</i>	<i>Follow-Up Needed (Yes/No)</i>
Vegetation	New vegetation		Water thoroughly if soil is not moist.		
	Broken or missing stakes/wires on young trees		Replace stakes/wires.		
	Dry conditions		Water plants as needed.		
	Invasive plant species		Remove by pulling out roots, if possible.		
	Mowing needed on side slopes and/or surrounding area		Mow or weed-eat as appropriate. Remove grass clippings. Avoid compacting soil with heavy mowers.		
Mulch	Little or no mulch around plants		Re-mulch void areas with <b>shredded</b> mulch (not chipped).		
Outlet / Outfall	Trash/debris/mulch around outlet pipe or grate		Clear debris from outlet structure(s) and remove from site.		
OTHER					

<i>Inspection/Maintenance Summary</i>	<i>Follow-Up Actions [Note work order #, if applicable.]</i>

*Sketch of Facility (note problem areas) / Photograph #*



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## Extended Detention Basin (Dry) / Retention Basin (Wet) MONTHLY MAINTENANCE INSPECTION CHECKLIST

Facility Name: \_\_\_\_\_

Location: \_\_\_\_\_

Today's Date: \_\_\_\_\_

Approximate Date of Last Rain Event: \_\_\_\_\_

Inspector's Name: \_\_\_\_\_

*Please provide keep hard copy of this report in the Stormwater Management Handbook for reference and use by Public Works.*

### Problem Severity Key

0 = Good condition. Well maintained, no action required.

1 = Moderate condition. Adequately maintained, routine maintenance needed.

2 = Degraded condition. Poorly maintained, routine maintenance and repair needed.

3 = Serious condition. Immediate need for repair or replacement.

N/A = Not applicable

**\*Write down maintenance needed for any problem ranked 1 or higher.**

### Monthly Tasks

Element	Potential Problem	Problem Severity	How to Fix? (circle all that apply)	Problem Corrected? (initials)	Follow-Up Needed (Yes/No)
Contributing Drainage Area	Excessive trash, debris, sediment, landscape waste		Remove from drainage area.		
Access	Maintenance access obstructed with vegetation, woody growth, structures		Mow, and/or bush hog, ensure clear access.		
	Valves, manholes, locks cannot be accessed		<b>Refer to Utility Crew</b>		
Inlets / Inflow	Trash/debris/sediment		Clear debris to ensure water flows into BMP. Remove from site.		
	Evidence of blockage		Determine source of debris and remove.		
	Inflow hindered by soil height, build up of sediment and/or grass		Modify inflow points to ensure positive drainage into BMP.		
Pre-Treatment Area (if present)	Excessive trash/debris/sediment in forebay or other pre-treatment areas		Remove from pre-treatment area and away from site.		
	Evidence of clogging: standing water, algae, etc.		Clear source of clogging (leaves, debris, etc.)		

Monthly Tasks					
<i>Element</i>	<i>Potential Problem</i>	<i>Problem Severity</i>	<i>How to Fix? (circle all that apply)</i>	<i>Problem Corrected? (initials)</i>	<i>Follow-Up Needed (Yes/No)</i>
			Ensure water can flow into main ponding area of BMP.		
Basin Floor Area	Trash/debris		Remove trash/debris. Remove from site.		
	Tall grass or vegetation		Mow or bushhog as appropriate.		
			Avoid entering low, soggy areas with mowers or heavy equipment; use weed-eater.		
	Standing water; saturated conditions		Document conditions for 6 month/annual repairs; use mosquito dunks if larvae are present.		
Wetland Vegetation or Aquatic Bench (if present)	Check plant survival		Document conditions for 6 month/annual repairs		
	Check presence of invasives		Document conditions for 6 month/annual repairs		
	Mowing needed on side slopes and/or surrounding area		Mow or weed-eat as appropriate.		
Outlet / Outfall	Trash/debris/mulch around pipe or grate		Clear debris from outlet structure(s) and away from site.		
OTHER					

<i>Inspection/Maintenance Summary</i>	<i>Follow-Up Actions [Note work order #, if applicable.]</i>

*Sketch of Facility (note problem areas) / Photograph #*

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# Completed Periodic Inspections

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# Annual Inspections



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**9-C.16.0. EXTENDED DETENTION PONDS: O&M CHECKLIST**

Inspection Date \_\_\_\_\_  
 Project \_\_\_\_\_ Site Plan/Permit Number \_\_\_\_\_  
 Location \_\_\_\_\_ Date BMP Placed in Service \_\_\_\_\_  
 Date of Last Inspection \_\_\_\_\_ Inspector \_\_\_\_\_  
 Owner/Owner's Representative \_\_\_\_\_  
 As-Built Plans available: Y / N

Facility Type: Level 1 \_\_\_\_\_ Level 2 \_\_\_\_\_

Pond characteristics and functions  
(check all that apply)

- ☐ Water quality treatment
- ☐ Channel protection
- ☐ Ties into groundwater

Type of Pre-Treatment Facility:

- ☐ Sediment forebay (above ground)
- ☐ Vegetated buffer area
- ☐ Grass filter strip
- ☐ Grass channel
- ☐ Other: \_\_\_\_\_

Hydraulic Configuration:

- ☐ On-line facility
- ☐ Off-line facility

*Ideally, Extended Detention Ponds should be inspected annually. ED Ponds are prone to a high clogging risk at the ED low-flow orifice. Ideally, the orifice should be inspected at least twice a year after initial construction. The constantly changing water levels in ED Ponds make it difficult to mow or manage vegetative growth. The bottom of ED Ponds often become soggy, and water-loving trees such as willows may invade and will need to be managed. Periodic mowing of the stormwater buffer is only required along maintenance rights-of-way and the embankment. The remaining buffer may be managed as a meadow (mowing every other year) or forest. Frequent removal of sediment from the forebay (every 5-7 years, or when 50% of the forebay capacity is filled) is essential to maintain the function and performance of the ED Pond. Sediments excavated from ED Ponds are usually not considered toxic or hazardous, so they can be safely disposed of either by land application or land filling.*

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to Fix Problem	Who Will Address Problem	Comments
Contributing Drainage Area	Adequate vegetation				Supplement as needed.	Owner	
	There is excessive trash and debris				Remove immediately.	Owner or professional	
	There is evidence of erosion and/or bare or exposed soil				Stabilize immediately.	Owner or professional	
	There is excessive landscape waste and yard clippings				Remove immediately.	Owner or professional	
Pre-Treatment	There is adequate access to the pre-treatment facility				Establish adequate access	Professional and, perhaps, the locality	
	There is excessive trash and debris				Remove immediately.	Owner or professional	
	There is evidence of erosion and/or exposed soil.				Immediately identify and correct the cause of the erosion and stabilize the eroded or bare area.	Owner or professional	

Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
Pre-Treatment (continued)	Sediment deposits are 50% or more of forebay capacity.				Dredge the sediment to restore the design capacity; sediment should be dredged from forebays at least every 5-7 years, and earlier, as needed.	Professional	
	The sediment marker is not vertical.				Adjust the sediment depth marker to a vertical alignment	Professional	
	There is evidence of clogging				Clear blockages of the riser or orifice(s) and make other adjustments needed to meet the approved design specifications	Professional	
	There is dead vegetation				Revegetate, as needed	Owner or professional	
Inlet	The inlet provides a stable conveyance into the pond				Stabilize immediately, as needed, and clear blockages.	Owner or professional	
	There is excessive trash, debris, or sediment.				Remove immediately	Owner or professional	
	There is evidence of erosion/undercutting at or around the inlet				Repair erosion damage and restabilize	Owner or professional	
	There is cracking, bulging, erosion or sloughing of the forebay dam.				Repair and restabilize immediately.	Professional	
	There is woody growth on the forebay dam.				Remove within 2 weeks of discovery.	Professional	
	There is evidence of nuisance animals.				Animal burrows must be backfilled and compacted. Burrowing animals should be humanely removed from the area.	Professional	
	There is more than 1 inch of settlement.				Add fill material and compact the soil to the design grade	Owner or Professional	
	The inlet alignment is incorrect.				Correct immediately.	Owner or Professional	
Vegetation	Plant composition is consistent with the approved plans				Determine if existing plant materials are consistent with the general Wet Pond design criteria, and replace inconsistent species.	Professional	
	Invasive species are present.				Remove invasive species immediately and replace vegetation as needed.	Professional	
	Trees planted in the buffer and on wetland islands and peninsulas need watering during the first growing season				Consider watering every 3 days for first month, and then weekly during first year (April – October), depending on rainfall.	Owner or professional	
	Grass around the facility is overgrown				Mow (at least twice a year) to a height of 4"-9" high and remove grass clippings.	Owner or professional	

Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
Vegetation (continued)	Vegetation is dead or reinforcement planting is needed.				Remove and replace dead or dying vegetation.	Professional	
Permanent Pool and Side Slopes	There is excessive trash and/or debris.				Remove immediately	Owner or professional	
	There is evidence of sparse vegetative cover, erosion or slumping side slopes.				Repair and stabilize physical damage, and reseed or plant additional vegetation.	Owner or professional	
	There is evidence of nuisance animals.				Animal burrows must be backfilled and compacted. Burrowing animals should be humanely removed from area.	Owner or professional	
	There is significant sediment accumulation.				Conduct a bathymetric study to determine the impact to design volumes, and dredge if necessary.	Professional	
Riser/Principle Spillway and Low-Flow Orifice(s)	There is adequate access to the riser for maintenance.				Establish adequate access	Professional and, perhaps, the locality	
	Pieces of the riser are deteriorating, misaligned, broken or missing.				Repair immediately.	Professional	
	Adjustable control valves are accessible and operational.				Repair, as needed.	Professional	
	Reverse-slope pipes and flashboard risers are in good condition.				Repair, as needed.	Professional	
	Seepage into conduit				Seal conduit	Professional	
	There is evidence of clogging				Clear blockages of the riser or orifice(s) and make other adjustments needed to meet the approved design specs.	Professional	
	There is excessive trash, debris, or other obstructions in the trash rack.				Remove immediately.	Owner or professional	
Dam/ Embankment and Abutments	There is sparse veg. cover, settlement, cracking, bulging, misalignment, erosion rills deeper than 2 inches, or sloughing.				Repair and restabilize immediately, especially after major storms.	Professional	
	There are soft spots, seepage, boggy areas or sinkholes.				Reinforce, fill and stabilize immediately.		
	There is evidence of nuisance animals.				Animal burrows must be backfilled and compacted. Burrowing animals should be humanely removed from the area.		
	There is woody vegetation on the embankment.				Removal of woody species near or on the embankment and maintenance access areas should be done when discovered, but at least every 2 years.		

Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
Overflow/Emergency Spillway	There is woody growth on the spillway.				Removal of woody species near or on the emergency spillway should be done when discovered, but at least every 2 years.	Owner or professional	
	There is excessive trash, debris, or other obstructions.				Remove immediately.	Owner or professional	
	There is evidence of erosion/backcutting				Repair erosion damage and reseed	Owner or professional	
	There are soft spots, seepage or sinkholes.				Reinforce, fill and stabilize immediately.	Owner or professional	
	Only one layer of stone armoring exists above the native soil.				Reinforce rip-rap or other armoring materials.	Professional	
Outlet	The outlet provides a stable conveyance from the pond.				Stabilize immediately, as needed, and clear blockages.	Owner or professional	
	There is woody growth within 5 feet of the outlet pipe barrel.				Prune vegetation back to leave a clear discharge area.	Owner or Professional	
	There is excessive trash, debris, or other obstructions.				Remove immediately.	Owner or professional	
	There are excessive sediment deposits at the outlet.				Remove sediment.	Professional	
	Discharge is causing undercutting, erosion or displaced rip-rap at or around the outlet.				Repair, reinforce or replace rip rap as needed, and restabilize.	Professional	
Overall	Access to the facility or its components is adequate.				Establish adequate access. Remove woody vegetation and debris that may block access. Ensure that hardware can be opened and operated.	Professional and, perhaps, the locality	
	Fences are inadequate				Collapsed fences must be restored to an upright position. Jagged edges and damaged fences must be repaired or replaced.	Professional	
	Water levels in one or more cells are abnormally high or low.				Clear blockages of the riser or orifice(s) and make other adjustments needed to meet the approved design specifications.	Professional	
	Complaints from local residents				Correct real problems.	Owner or professional	
	Mosquito proliferation				Eliminate stagnant pools and stock the basin with mosquito fish to provide natural mosquito & midge control. Treat for mosquitoes as needed. If spraying, then use mosquito larvicide, (e.g., Bacillus thurensensis or Altoside formulations) <i>only if absolutely necessary</i> .	Owner or professional	

Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
Overall (continued)	Encroachment on the pond or easement by buildings or other structures				Inform involved property owners of BMPs status ; clearly mark the boundaries of the receiving pervious area, as needed	Owner or professional (and perhaps the locality)	
	Safety signage is not adequate.				Provide sufficient, legible safety signage.	Owner or professional	

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**9-C.13.0. FILTERING PRACTICES: O&M CHECKLIST**

Inspection Date \_\_\_\_\_  
 Project \_\_\_\_\_ Site Plan/Permit Number \_\_\_\_\_  
 Location \_\_\_\_\_ Date BMP Placed in Service \_\_\_\_\_  
 Date of Last Inspection \_\_\_\_\_ Inspector \_\_\_\_\_  
 Owner/Owner's Representative \_\_\_\_\_  
 As-Built Plans available: Y / N

Facility Type: Level 1 \_\_\_\_\_ Level 2 \_\_\_\_\_

## Facility Location:

- ☐ Surface  
☐ Underground

## Hydraulic Configuration:

- ☐ On-line facility  
☐ Off-line facility

## Filtration Media:

- ☐ No filtration (e.g., dry well, permeable pavement, infiltration facility, etc.)  
☐ Sand  
☐ Bioretention Soil  
☐ Peat  
☐ Other: \_\_\_\_\_

## Type of Pre-Treatment Facility:

- ☐ Sediment forebay (above ground)  
☐ Sedimentation chamber  
☐ Plunge pool  
☐ Stone diaphragm  
☐ Grass filter strip  
☐ Grass channel  
☐ Other: \_\_\_\_\_

*An inspection and clean-up should be scheduled annually to remove trash and floatables that accumulate in the pre-treatment cells and filter bed. Frequent sediment cleanouts in the dry and wet sedimentation chambers are recommended every 2-3 years to maintain the function and performance of the filter. If the filter treats runoff from a hotspot, crews may need to test the filter bed media before disposing of the media and trapped pollutants. If the filter does not treat runoff from a hotspot, the media can be safely disposed by either land application or land filling, without prior testing.*

**Warning:** *If the filtering facility has a watertight cover, be careful regarding the possibility of flammable gases within the facility. Care should be taken lighting a match or smoking while inspecting facilities that are not vented. If the filtering facility is in a completely enclosed vault, the **OSHA Confined Space Entry** procedures must be followed.*

Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
Contributing Drainage Area and Side Slopes	Adequate vegetation				Supplement as necessary	Owner	
	There is excessive trash and debris				Remove immediately	Owner or professional	
	There is evidence of erosion and / or bare or exposed soil				Stabilize immediately	Owner or professional	
	There are excessive landscape waste or yard clippings				Remove immediately and recycle or compost	Owner or professional	
Pre-Treatment	There is adequate access to the pre-treatment facility				Establish adequate access	Professional and, perhaps, the locality	
	Excessive trash,				Remove immediately	Owner or	



Element of BMP	Potential Problem	Problem? Y / N	Investigate? Y / N	Repaired? Y / N	How to Fix Problem	Who Will Address Problem	Comments
	debris, or sediment.					professional	
Pre-Treatment (continued)	There is evidence of erosion and / or exposed soil				Stabilize immediately	Owner or professional	
	There is dead vegetation.				Replace dead vegetation as necessary	Professional	
	Perimeter turf (or a grass filter strip) is too high.				Mow at least 4 times a year to keep the grass at a height of 4" to 9". Remove grass clippings after mowing.	Owner or professional	
	There is evidence of oil, grease, clogging (standing water, noticeable odors, water stains, algae)				Identify and eliminate the source of the problem. If necessary, remove and clean or replace the clogged material.	Professional	
Inlets	The inlet provides a stable conveyance into the swale				Stabilize immediately, as needed, and clear blockages.	Owner or professional	
	There is excessive trash, debris, or sediment.				Remove immediately	Owner or professional	
	There is evidence of erosion at or around the inlet				Repair erosion damage and reseed	Owner or professional	
Sedimentation Chambers	Sediment or debris accumulations are excessive				Clean out the wet and dry sedimentation chambers	Professional	
Filter Media	If facility takes longer than 48 hours to drain or filter media is discolored, the media is probably clogged				Replace the top sand layer of an enclosed filter (typically done every 5 years). Till or aerate the surface to improve infiltration and grass cover of an open filter (also typically done every 5 years).		
Oil and Grease	Evidence of filter surface clogging				Clean or replace filter media, as necessary.	Professional	
Underdrain	The underdrain is not conveying water as designed				To determine if the pipe is clogged, measure the draw-down rate of the observation well for three days following a storm event in excess of 1/2 inches in depth. After three days, if there is standing water on top but not in the underdrain, this indicates a clogged sand layer that must be replaced. If standing water is both on the surface and in the underdrain, then the underdrain is probably clogged. Immediately clean out the pipe manually or, if needed, use a high-pressure hose. Replace the underdrain if it is structurally damaged.	Professional	

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to Fix Problem	Who Will Address Problem	Comments
Observation Well (every 2 years)	Is the observation well still capped?				Repair, as necessary.	Professional	
Outlet	The outlet provides stable conveyance				Remove blockages and stabilize, as needed.	Professional	
	Evidence of flow bypassing facility				Repair immediately	Professional	
	Outlets are obstructed or erosion and soil exposure is evident below the outlet.				Remove obstructions and stabilize eroded or exposed areas.	Owner or Professional	
Structural Components	Evidence of structural deterioration				Repair as necessary	Professional	
	Evidence of spalling or cracking of structural components				Repair or replace, as necessary	Professional	
	Grates are in good condition				Repair or replace, as necessary	Owner or professional	
Pump (where applicable)	Catalog cuts and wiring diagram for pump available				If missing, obtain replacements	Owner	
	Waterproof conduits for wiring appear to be intact				Repair as necessary	Professional	
	Panel box is well marked				If not, mark it correctly	Professional	
	No evidence of pump failure (excess water in pump well, etc.)				Repair as necessary	Professional	
Overall	Access to the facility or its components is adequate.				Establish adequate access. Remove woody vegetation and debris that may block access. Ensure that hardware can be opened and operated.	Professional and, perhaps, the locality	
	Condition of hydraulic control components				Repair, as necessary.	Professional	
	Complaints from local residents				Correct real problems.	Owner or professional	
	Noticeable odors outside facility				Determine source and eliminate it.	Professional	
	Mosquito proliferation				Eliminate stagnant pools if feasible, and treat for mosquitoes as needed. If sprays are considered, then a mosquito larvicide, such as <i>Bacillus thurensensis</i> or Altoside formulations can be applied <i>only if absolutely necessary</i> .	Owner or professional	
	Encroachment on the filter or easement by buildings or other structures				Inform involved property owners of BMPs status ; clearly mark the boundaries of the receiving pervious area, as needed	Owner or professional (and perhaps the locality)	

**9-C.10.0. BIORETENTION PRACTICES: O&M CHECKLIST**

Inspection Date \_\_\_\_\_  
 Project \_\_\_\_\_ Site Plan/Permit Number \_\_\_\_\_  
 Location \_\_\_\_\_ Date BMP Placed in Service \_\_\_\_\_  
 Date of Last Inspection \_\_\_\_\_ Inspector \_\_\_\_\_  
 Owner/Owner's Representative \_\_\_\_\_  
 As-Built Plans available: Y / N

Facility Type: Level 1 \_\_\_\_\_ Level 2 \_\_\_\_\_

## Facility Location:

- ☐ Surface  
☐ Underground

## Hydraulic Configuration:

- ☐ On-line facility  
☐ Off-line facility

## Filtration Media:

- ☐ No filtration (e.g., dry well, permeable pavement, infiltration facility, etc.)  
☐ Sand  
☐ Bioretention Soil  
☐ Peat  
☐ Other: \_\_\_\_\_

## Type of Pre-Treatment Facility:

- ☐ Sediment forebay (above ground)  
☐ Sedimentation chamber  
☐ Plunge pool  
☐ Stone diaphragm  
☐ Grass filter strip  
☐ Grass channel  
☐ Other: \_\_\_\_\_

*Ideally, Bioretention facilities should be inspected and cleaned up annually, preferably during the Spring. During the first 6 months following construction of a bioretention facility, the site should be inspected at least twice after storm events that exceed 1/2-inch of rainfall. Watering is needed once a week during the first 2 months following installation, and then as needed during the first growing season (April-October), depending upon rainfall. If vegetation needs to be replaced, one-time spot fertilization may be needed, preferably using an organic rather than a chemical fertilizer. Each facility should have a customized routine maintenance schedule addressing issues such as the following: grass mowing, weeding, trash removal, mulch raking and maintenance, erosion repair, reinforcement plantings, tree and shrub pruning, and sediment removal.*

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to fix problem	Who Will Address Problem	Comments
Contributing Drainage Area	Adequate vegetation				Supplement as necessary	Owner or professional	
	There is excessive trash and debris				Remove immediately	Owner or professional	
	There is evidence of erosion and / or bare or exposed soil				Stabilize immediately	Owner or professional	
	There are excessive landscape waste or yard clippings				Remove immediately and recycle or compost	Owner or professional	
	Oil, grease or other unauthorized substances are entering the facility				Identify and control the source of this pollution. It may be necessary to erect fences, signs, etc	Owner or professional	
Pre-Treatment	There is adequate access to the pre-				Establish adequate access	Professional and, perhaps,	

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to fix problem	Who Will Address Problem	Comments
	treatment facility					the locality	
	Excessive trash, debris, or sediment.				Remove immediately	Owner or professional	
Pre-Treatment (continued)	There is evidence of clogging (standing water, noticeable odors, water stains, algae or floating aquatic vegetation, or oil/grease)				Identify and eliminate the source of the problem. If necessary, remove and clean or replace the clogged material.	Professional	
	There is evidence of erosion and / or exposed soil				Stabilize immediately	Owner or professional	
	There is dead vegetation or exposed soil in the grass filter				Restabilize and revegetate as necessary	Owner or professional	
Inlets	Check for sediment build-up at curb cuts, gravel diaphragms or pavement edges that prevent flow from getting into the bed, and check for bypassing.				Remove sediment and correct any other problems that block inflow.	Owner or professional	
	There is excessive trash, debris, or sediment.				Remove immediately	Owner or professional	
	There is evidence of erosion at or around the inlet				Repair erosion damage and reseed or otherwise restabilize with vegetation	Owner or professional	
	Inflow is hindered by trees and/or shrubs.				Remove woody vegetation from points of inflow and directly above underdrains. (Trees and shrubs may be located closer to the perimeter.)	Owner or professional	
Side Slopes (Annually, after major storms)	There is evidence of rill or gully erosion or bare soil				Identify the source of erosion damage and prevent it from recurring. Repair erosion damage and reseed or otherwise restabilize with vegetation	Owner or professional	
	There is excess sediment accumulation				Remove immediately	Owner or professional	
	Side slopes support nuisance animals.				Animal burrows must be backfilled and compacted. Burrowing animals should be humanely removed from the area.	Professional	
Vegetation (monthly)	Plant composition is consistent with the approved plans and any stakes or wires are in good condition.				Determine if existing plant materials are at least consistent with general Bioretention design criteria and replace inconsistent species.	Professional	
	There should be 75-90% cover (mulch plus vegetation), and the mulch cover should be 2-3 inches deep.				Supplement vegetation and mulch as needed.		

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to fix problem	Who Will Address Problem	Comments
Vegetation (monthly) (continued)	There is evidence of hydrocarbons or other deleterious materials, resulting in unsatisfactory plant growth or mortality,				Replace contaminated mulch. If problem persists, test soils for hydrocarbons and other toxic substances. If excess levels are found, the soils, plants and mulch may all need to be replaced in accordance with the approved construction plans.	Professional	
	Invasive species or weeds make up at least 10% of the facility's vegetation				Remove invasive species and excessive weeds immediately and replace vegetation as needed.	Owner or professional	
	The grass is too high				Mow within a week. Grass species should be selected that have dense cover, are relatively slow growing, and require the least mowing and chemical inputs. Grass should be from 6-10 inches high.	Owner or professional	
	Vegetation is diseased, dying or dead				Remove and replace. Increase watering, but avoid using chemical fertilizers, unless absolutely necessary.	Professional	
	Winter-killed or salt-killed vegetation is present.				Replace with hardier species.	Owner or professional	
Filter Media (Annually)	The filter media is too low, too compacted, or the composition is inconsistent with design specifications				Raise the level, loosen and amend or replace the media, as needed, to be consistent with the state design criteria for Bioretention (85-88% sand 8-12% soil fines 3-5% organic matter in form of leaf compost). Other remediation options are described in the maintenance section of the state design criteria for Bioretention	Professional	
	The mulch is older than 3 years or is otherwise in poor condition				The mulch must be replaced every 2-3 years	Professional	
	There is evidence that chemicals, fertilizers, and/or oil/grease are present				Remove undesirable chemicals from media and facility immediately, and replace mulch or media as needed	Professional	
	There is excessive trash, debris, or sediment.				Remove trash and debris immediately. Check plant health and, without damaging plants, manually remove the sediment, especially if the depth exceeds 20% of the facility's design depth.	Owner or professional	
	There is evidence of concentrated flows, erosion or exposed soil				Identify the source of erosion damage and prevent it from recurring. Repair the erosion damage and reseed or otherwise restabilize with vegetation.	Professional	

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to fix problem	Who Will Address Problem	Comments
Filter Media (Annually) (continued)	The filter bed is clogged and/or filled inappropriately				Redistribute the soil substrate and remove sediment within 2 weeks.	Professional	
	The topsoil is in poor condition (e.g., the pH level is not 6-7, the composition is inappropriate, etc.)				Ensure a 3-inch surface depth of topsoil consistent with the state design criteria for Bioretention (loamy sand or sandy loam texture, with less than 5% clay content, and organic matter content of at least 2%). If the pH is less than 6.5, spread limestone.	Professional	
Underdrain/ Proper Drainage	The perforated pipe is not conveying water as designed				Determine if the pipe is clogged with debris or if woody roots have pierced the pipe. Immediately clean out or replace the pipe, as necessary.	Professional	
	The underlying soil interface is clogged (there is evidence on the surface of soil crusting, standing water, the facility does not dewater between storms, or water ponds on the surface of basin for more than 48 hours after an event).				Measure the draw-down rate of the observation well for three days following a storm event in excess of 1/2 inches in depth. After three days, if there is standing water on top but not in the underdrain, this indicates a clogged soil layer. If standing water is both on the surface and in the underdrain, then the underdrain is probably clogged. This should be promptly investigated and remediated to restore proper filtration. Grading changes may be needed or underdrain repairs made. The filter media may need to be raked, excavated and cleaned or replaced to correct the problem. Holes that are not consistent with the design and allow water to flow directly through a planter to the ground must be plugged.	Professional	
Planters	The planter is unable to receive or detain stormwater prior to infiltration. Water does not drain from the reservoir within 3-4 hours of after a storm event.				Identify and correct sources of clogging. Topsoil and sand/peat layer may need to be amended with sand or replaced all together.	Owner or professional	
	The planter has structural deficiencies, including rot, cracks, and failure, or the planter is unable to contain the filter media or vegetation				Make needed repairs immediately.	Owner or professional	
Outlet/ Overflow Spillway	Outlets are obstructed or erosion and soil exposure is evident below the outlet.				Remove obstructions and stabilize eroded or exposed areas.	Owner or Professional	

Element of BMP	Potential Problem	Problem? Y/N	Investigate? Y/N	Repaired? Y/N	How to fix problem	Who Will Address Problem	Comments
Outlet/ Overflow Spillway (continued)	There is excessive trash, debris, or sediment at the outlet				Remove immediately, and keep the contributing area free of trash and debris.	Owner or professional	
	Any grates present are in good condition				Repair or replace as necessary	Owner or professional	
Observation Well	Is the observation well still capped?				Repair, as necessary.	Professional	
Overall	Access to the infiltration facility or its components is adequate				Establish adequate access. Remove woody vegetation and debris that may block access. Ensure that hardware can be opened and operated.	Professional and, perhaps, the locality	
	There is evidence of standing water				Fill in low spots and stabilize; correct flow problems causing ponding.	Owner or professional	
	Mosquito proliferation				Eliminate stagnant pools and establish vegetation; treat for mosquitoes as needed. If sprays are considered, then a mosquito larvicide, such as Bacillus thurendensis or Altoside formulations can be applied <i>only if absolutely necessary</i> .	Owner or professional	
	Complaints from local residents				Correct real problems	Owner or professional	
	Encroachment on the bioretention area or easement by buildings or other structures				Inform involved property owners of BMPs status ; clearly mark the boundaries of the receiving pervious area, as needed	Owner or professional (and perhaps the locality)	

# Completed Annual Inspections