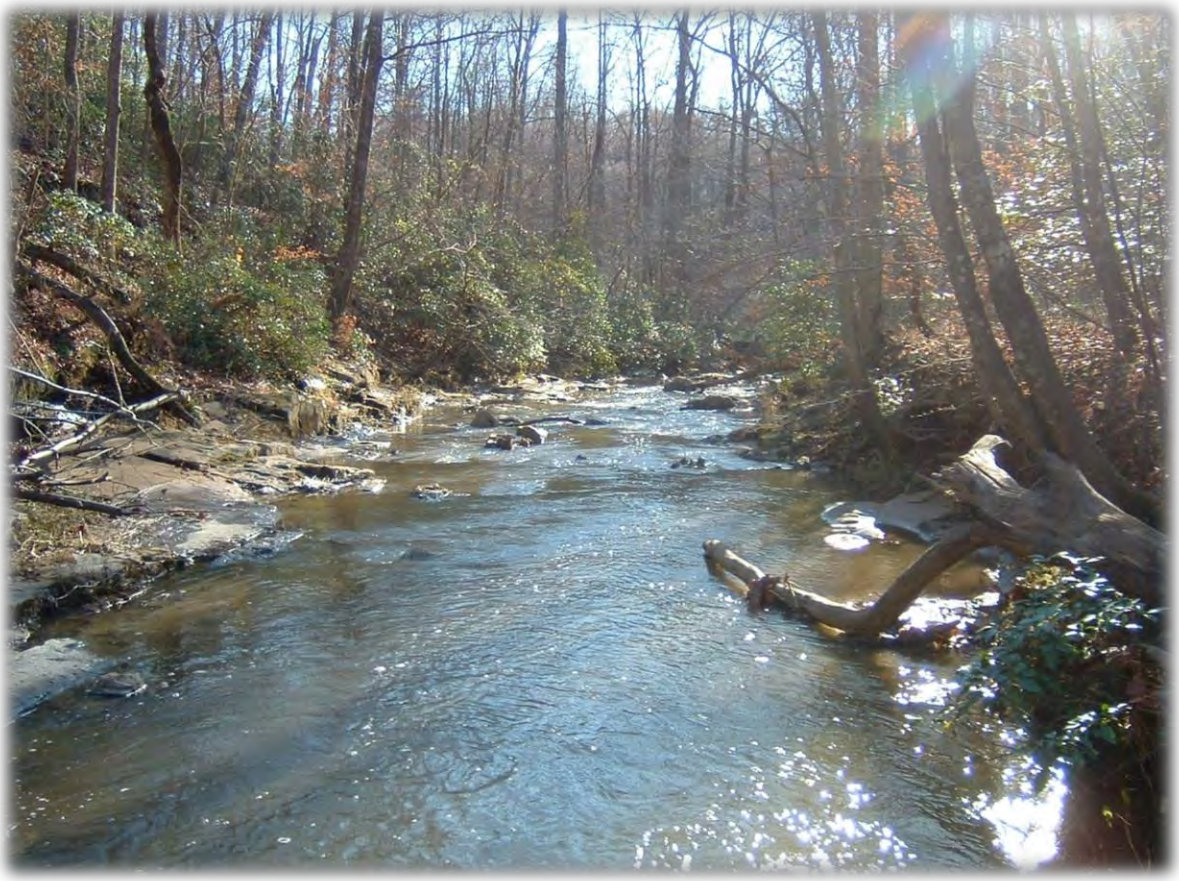
Town of Dumfries, Virginia

MS4 Program Plan

Cycle: July 1, 2013 – June 30, 2018
Permit Number: VAR040117

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



Program Plan Prepared by: Town of Dumfries

Town of Dumfries

MS4 Program Plan

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1. Introduction

The Town of Dumfries is an incorporated town located in Northern Virginia and is surrounded by Prince William County. The Town comprises approximately 1.6 square miles of urban mixed use land development located approximately 25 miles south of Washington, D.C. The town 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, Town, 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 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 Town's population to be 4,961, that the Town 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. As required by the MS4 permit, this report addresses items of the Town of Dumfries MS4 Program pertinent to the Virginia General Permit for Discharges from Small Municipal Storm Sewer Systems.

2. Watersheds

The Town of Dumfries's 1.6 square miles is highly urbanized and is encompassed by a sole watershed area, Quantico Creek, which discharges into the Potomac River. If appropriate measures are not taken to protect and prevent further degradation to Quantico Creek, water quality will decline beyond current existing conditions.

Subwatershed Name	Hydrologic Unit Code (HUC)	Approximate Length (miles) within Dumfries	Approximate Drainage Area (acres)	Impairments	TMDL WLA?
Quantico Creek	020700110104	1.45	4,877	▪ PCB in Fish Tissue ▪ Estuarine Bioassessments ▪ Sediment	No

Quantico Creek Watershed, Prince William County, VA

The Town of Dumfries 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 Town of Dumfries to address impairments for phosphorus, nitrogen, and sediment that enter the Chesapeake Bay.

Chesapeake Bay Watershed Map

3. Organizational Structure

The Town of Dumfries' Public Works Department coordinates the Town's municipal separate storm sewer system (MS4) program. The Public Works Department's Public Works Director is responsible for developing and updating the MS4 Program Plan and submitting Annual Reports. The Town Manager is responsible for providing the appropriate certification for documents. The Department of Community Services, Police Department, and other relevant town staff are the major contributors to Dumfries' MS4 Program although it is recognized that this is a town-wide and community-wide program.

The MS4 Program Plan that follows identifies which town department and title of the staff person(s) responsible for implementing specific best management practices.

4. Contact Information

Principal Executive Officer
Title: Acting Town Manager Name: Gerald Foreman Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 Email: hongforeman@dumfriesva.gov

Duly Authorized Representative
Title: Public Works Director Name: Richard West Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 Email: rwest@dumfriesva.gov

5. MS4 Program Plan

The MS4 Program Plan details the Town of Dumfries' 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 Dumfries' stormwater webpages:

http://www.dumfriesva.gov/governmentpublic-worksmunicipal-separate-storm-sewer-system-ms4

Minimum Control Measure #1: Education & Outreach on Stormwater Impacts

The MS4 Permit requires the Town of Dumfries 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.

BMP 1.1 Develop and Implement Stormwater Public Education and Outreach Program
1.1.1 Description: The Town 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 permit.
1.1.2 Goals and Objectives: The MS4 Permit requires the Town of Dumfries 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: <u>Public Works Department</u> *Public Works Director* *Assistant Public Works Director* *Public Works and Zoning Program Administrator*
1.1.4 Schedule of Implementation: High-priority issues for education and outreach are set forth in the Education and Outreach Program. These issues will be evaluated annually. Existing efforts will either be continued or activities for new issues will be developed. The Town will use citizen calls, complaints, site visits, and other methods of outreach to help inform our selection of priority issues each year.

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 (See BMP 1.2).
- 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 (See BMP 1.3).

Program Plan Requirements:

- The MS4 Program Plan shall describe how the conditions of the permit shall be updated.

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 attained.

The Education and Outreach Plan will be referenced in the 2014-15 MS4 Annual Report. Education and outreach initiatives occurred in the 2014-15 reporting year, but they will not coincide with the Education and Outreach Plan until the 2015-2016 reporting year.

BMP 1.2 List of Education and Outreach Activities Conducted During Reporting Period

1.2.1 Description: The Town shall continue to document the annual activities for the reporting period.

1.2.2 Goals and Objectives: Accurately and consistently document, report, and announce all education and outreach activities conducted during the annual reporting cycle.

1.2.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Public Works and Zoning Program Administrator

1.2.4 Schedule of Implementation: The Town will follow its Public Education and Outreach Program for its annual activity implementation. The program will be evaluated annually as set forth in BMP 1.1 and activities for the current reporting period submitted accordingly.

1.2.5 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.

BMP 1.3 List of Education and Outreach Activities To Be Conducted During Next Reporting Period

1.3.1 Description: The Town shall continue to announce and list the education and outreach activities planned for the next reporting period. Proposed education and outreach initiatives include:

- Handing out educational brochures at Town events on various topics such as impacts of pet waste on water quality, basic stormwater management practices, and proper disposal of leaves.
- In-person trainings for automobile washes, automobile repair shops, and restaurants to address the basics of stormwater runoff and how improper water discharges from these establishments can degrade water quality in local waters.

1.3.2 Goals and Objectives: Accurately and consistently promote, announce, document and report all upcoming education and outreach activities, including those planned for the next program year.

1.3.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Public Works and Zoning Program Administrator

1.3.4 Schedule of Implementation: The Town will follow its Public Education and Outreach Program for its annual activity implementation, including that of each upcoming year. The program will be evaluated annually as set forth in BMP 1.1 and activities for the forthcoming reporting period submitted accordingly.

1.3.5 Annual Reporting Requirements:

- 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.

Minimum Control Measure #2: Public Involvement/Participation

BMP 2.1: Maintaining Updated MS4 Program Plan and Annual Reports
2.1.1 Description: The Town of Dumfries will review and, as needed, will update the MS4 Program Plan in conjunction with the Annual Report as required at a minimum of once a year. The Town shall post copies of the MS4 Program Plan on its website within 30 days of submittal of the Annual Report. The Town shall solicit public comment of the MS4 Program Plan prior to applying for coverage and address how comments were received on the MS4 Program Plan as part of the reapplication package.
2.1.2 Goals and Objectives: To solicit public participation and comment through availability of MS4 Program Plan.
2.1.3 Responsible Departments/Employees: Public Works Department *Public Works Director* *Public Works and Zoning Program Administrator*
2.1.4 Schedule of Implementation: • Promote availability of the MS4 Program Plan to citizens (posting online, etc.): Years 1-5 • Solicit and receive public comment on MS4 Program Plan prior to applying for coverage: Years 4-5 • Update MS4 Program Plan as needed: Years 1-5
2.1.5 Policies and Procedures: The Public Works Director is responsible for updating and making available the MS4 Program Plan. The Public Works Director will make the Town's MS4 Program Plan and Annual Reports available on the Town's website: www.dumfriesva.gov. This MS4 Program Plan will be reviewed annually and updated as necessary. The Town will receive and document public comments on the proposed MS4 Program Plan and address comments, as appropriate, in updates to the MS4 Program Plan. Prior to applying for coverage for the next permit cycle (2018-2023), the Town of Dumfries will notify the public and provide for receipt of comment of the proposed MS4 Program Plan that will be submitted with the registration statement.
2.1.6 Annual Reporting Requirements: • The Town shall post copies of the MS4 Program on the Town website within 30 days of submittal of the Annual Report (Due each October 1). • Post copies of the Annual Report to the Town website within 30 days of submittal to VDEQ and retain copies of Annual Reports online for the duration of this state permit.

BMP 2.2: Public Participation Events

2.2.1 Description: The Town of Dumfries will participate in at least four local activities annually. Participation can be through promotion, sponsorship, or other involvement. Information for these activities will be advertised, tracked, and stored in the Town's archives and online. The four activities planned for the five year permit cycle may vary. Below are examples of four proposed events:

- Quantico Creek Clean Up
- Storm Drain Marking
- Elementary School Field Trips
- Informational Table at Town Events

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:

Public Works Department
Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

Community Services Department
Community Services Director

2.2.4 Schedule of Implementation:

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

2.2.5 Procedure for Implementation:

The Public Works Director is responsible for ensuring that at least four (4) activities are identified, and that a responsible lead is identified for each activity.

2.2.6 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.

Minimum Control Measure #3: Illicit Discharge Detection and Elimination

BMP 3.1: Storm Drain System, Outfalls, and Information Map

3.1.1 Description: The Town of Dumfries will maintain an updated map of the Town's MS4 system.

3.1.2 Goals and Objectives: Maintenance and updates of the Storm Drain System Map.

3.1.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Maintenance Crew

3.1.4 Policies and Procedures:

The storm sewer system map must show the following, at a minimum:

- 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
- The name and location of all waters receiving discharges from the MS4 outfalls and the associated HUC.

The associated information table shall include for each outfall the following:

- The unique identifier;
- The estimated MS4 acreage served;
- The name of the receiving surface water and indication as to whether the receiving water is listed as impaired in the Virginia 2010 303(d)/305(b) Water Quality Assessment Integrated Report; and
- The name of any applicable TMDL or TMDLs.

3.1.5 Schedule of Implementation:

- Update Town's Storm Drain System Map: Years 1-5
- Have complete and updated storm sewer system map and information table: Year 3

3.1.6 Annual Reporting Requirements:

- None. Data available upon request.

BMP 3.2: Maintenance of BMP Tracking System

3.2.1 Description: The Town of Dumfries will maintain a BMP tracking system.

3.2.2 Goals and Objectives: Maintenance and update of the BMP tracking system

3.2.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Public Works and Zoning Program Administrator

3.2.4 Policies and Procedures:

The BMP Tracking System must contain:

- All eligible developed/urban BMPs that have been implemented and documented since July 1, 1999;
- General BMP information such as BMP type, location/address, property owner, installation date, and maintenance agreement information;
- Utilize Quality Assurance/Quality Control Measures to ensure integrity of the data.

3.2.5 Schedule of Implementation:

- Update BMP Tracking System: Year 2
- Have complete and updated BMP Tracking System: Year 3

3.2.6 Annual Reporting Requirements:

- None. Data available upon request.

BMP 3.3: Bacteria Sampling and Testing

3.3.1 Description: The Town of Dumfries will maintain records of bacteria sampling conducted by Jim White, a citizen volunteer monitor with the Prince William Soil and Water Conservation District.

3.3.2 Goals and Objectives: Continue annual bacteria sampling and testing to report to DEQ.

3.3.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Public Works and Zoning Program Administrator

Prince William County Soil & Water Conservation District
Volunteers

3.3.4 Policies and Procedures:

The Prince William County Soil & Water Conservation District utilizes volunteers to take bacteria samples from four identified point sources and report the results to DEQ annually.

3.3.5 Schedule of Implementation:

- Annual reporting of bacteria sampling and testing: Years 1-5

3.3.6 Annual Reporting Requirements:

- Data is submitted to DEQ annually and posted on the State's website.

BMP 3.4 Notification of Regulated Downstream MS4

3.4.1 Description: The Town of Dumfries will notify, in writing, any downstream regulated MS4 to which the small regulated MS4 is physically interconnected.

3.4.2 Goals and Objectives: 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.

3.4.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

3.4.4 Implementation Schedule:

- Send written notice to downstream MS4: Year 3
- Document received written notice from upstream MS4 (PWC, VDOT): Year 2

3.4.5 Annual Reporting Requirements:

- A list of written notifications of physical interconnection given by the Town to other MS4s.

BMP 3.5: Illicit Discharges & Connections Ordinance

3.5.1 Description: The Town of Dumfries will effectively prohibit non-stormwater discharges into the storm sewer system by adopting an Illicit Discharges and Connections ordinance.

3.5.2 Goals and Objectives: To use an Illicit Discharge & Connections ordinance to operate an IDDE program effectively to eliminate non-stormwater discharges to storm sewer system.

3.5.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works and Zoning Program Administrator

Town Attorney's Office
Town Attorney

3.5.4 Schedule of Implementation:

- Enact ordinance: Year 3
- Utilize ordinance to prohibit non-stormwater discharges to MS4: Years 3-5

3.5.5 Annual Reporting Requirements:

- None, unless ordinance is adopted or amended.

BMP 3.6: Written Procedures to Detect & Eliminate Illicit Discharges

3.6.1 Description: The Town of Dumfries shall implement and update written procedures to detect, identify, and address unauthorized non-stormwater discharges to the MS4.

3.6.2 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
- 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

3.6.3 Responsible Department/Employees:

Public Works Department

Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

3.6.4 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

3.6.5 Written Procedures:

a. Dry Weather Field Screening Methodologies

- The Town will follow its Dry Weather Field Screening Methodologies based on regulatory requirements and best management practices. These procedures will be evaluated and updated from time to time as to adapt to changing best practices or modifications to regulations (See Appendix B – Dry Weather Field Screening Methodologies and IDDE Investigation Procedures).

b. Illicit Discharge Investigation Procedures

- The Town will follow its IDDE Investigation Process based on regulatory requirements and best management practices as enumerated and cited in its written procedures. The procedures shall be monitored and updated from time to time to adapt to changing best practices or evolving regulations (see Appendix A - IDDE Investigation Procedures).

3.6.6 Annual Reporting Requirements:

- The 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 3.7: Promotion and Facilitation of Public Reporting of Illicit Discharges

3.7.1 Description: The Town of Dumfries shall operate and promote an online pollution reporting form for citizens to report illicit discharges. Citizens may also call the Town of Dumfries for reporting.

3.7.2 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 Town in investigating and eliminating illicit discharges. www.dumfriesva.gov

3.7.3 Responsible Department/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director

Public Works and Zoning Program Administrator

3.7.4 Schedule of Implementation:

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

3.7.5 Annual Reporting Requirements:

- None. Data available upon request.

Minimum Control Measure #4: Construction Site Stormwater Runoff Control

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

4.1.1 Description: The Town of Dumfries will implement its ordinance and legal authorities to require erosion and sediment controls on construction sites that disturb 10,000 square feet or greater, or land-disturbing activities in jurisdictions in Tidewater Virginia, as defined in § 62.1-44.15:68 of the Code of Virginia, that disturb 2,500 square feet or greater and are located in areas designated as Resource Protection Areas (RPA), Resource Management Areas (RMA) or Intensely Developed Acres (IDA), pursuant to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act. Legal authorities include:

- Chapter 26, Article IV of the Town Code describes the Erosion and Sediment Control Ordinance.
- Town's Subdivision (Chapter 54) and Zoning Ordinance (Chapter 70)
- 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 Town's erosion and sediment control program can be found at: www.dumfriesva.gov (Note: The Town of Dumfries utilizes an agreement in lieu of a plan for the construction of single-family residences as provided in Code of Virginia §62.1-44.15:55.)

The Town requires that land disturbance not begin until and erosion and sediment control plan or an agreement in lieu of a plan is approved by the Town.

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

4.1.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director

4.1.4 Schedule of Implementation:

- Town Ordinance has been revised (Chapter 26, Article IV) per § 62.1-44.15:51 et seq., Erosion and Sediment Control Law, Code of Virginia.

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

- Procedures for Site Plan Review;
- Site Plan Review Checklist;
- Design and Construction Standards Manual;
- Town Code (E&S Control);
- Virginia Erosion and Sediment Control Law;
- State Water Control Board; Erosion and Sediment Control Regulations, Chapter 840;
- Town Code Sections:
    - Sec 26-102. Submission and approval of plans; contents of plans;
    - Sec 26-103. Permits; fees; security for performance.

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

- Town Code Sec. 26-104. Monitoring, reports and inspections

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

- Town Code Sec. 26-105. Penalties, injunctions, and other legal actions

4.1.8 Annual Reporting Requirements:

- None. Data available upon request.

BMP 4.2: Inspections and Tracking of Land Disturbance Activities

4.2.1 Description:

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

The MS4 Annual Reports shall include:

(a) total number of land disturbing activities,
(b) total number of acres disturbed,
(c) total number of inspections conducted, and
(d) a summary of enforcement actions taken including total number and type of enforcement actions taken during reporting period.

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

4.2.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works and Zoning Program Administrator

Planning & Zoning Department
Zoning Administrator

4.2.4 Schedule of Implementation:

- Conduct Inspections of Land Disturbing Activities: Years 1-5 (Town Inspectors)
- Track regulated land-disturbing activities: Years 1-5 (Public Works and Zoning Program Administrator)
- Maintain copies of inspection reports from construction inspections: Years 1-5 (Public Works and Zoning Program Administrator)
- Maintain documentation of certificates of competence of staff members who conduct erosion and sediment control inspections: Years 1-5 (Public Works and Zoning Program Administrator)

4.2.5 Annual Reporting Requirements:

- Total number of regulated land-disturbing activities
- Total number of acres disturbed
- Total number of inspections conducted
- Summary of enforcement actions taken, including the total number and type of enforcement actions taken during the reporting period

BMP 4.3: Require VSMP Permit for Land Disturbing Activities

4.3.1 Description: The Town of Dumfries requires all land disturbing activities encompassing areas of over 2,500 square feet to secure a VSMP storm water permit, through the Town's MS4 Permit Program, for the activity.

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

4.3.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

Planning & Zoning Department
Zoning Administrator

4.3.4 Schedule of Implementation:

- Require VSMP permit for all land disturbing activities over 2,500 SF: Years 1-5

4.3.5 Annual Reporting Requirements:

- None. Data available upon request.

BMP 4.4: Promote to the Public a Mechanism for Receipt of Complaints Regarding Regulated Land Disturbing Activities

4.4.1 Description: The Town of Dumfries promotes reporting of construction site issues through contact with the public at public outreach & education events described in MCM 1 and 2, and also promotes reporting through its website at www.dumfriesva.gov. Calls are received by the Departments of Public Works and Planning & Zoning.

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

4.4.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

Planning & Zoning Department
Zoning Administrator

4.4.4 Schedule of Implementation:

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

4.5.5 Annual Reporting Requirements:

- None. Data available upon request.

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

BMP 5.1: Ordinance and other legal authorities to address Post-Construction Runoff
5.1.1 Description: The Town of Dumfries 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: • Chapter 26, Article V of the Town Code describes the Stormwater Management Ordinance Additional information about the Town's stormwater management program can be found at: http://www.dumfriesva.gov/governmentpublic-worksmunicipal-separate-storm-sewer-system-ms4
5.1.2 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.
5.1.3 Responsible Departments/Employees: Public Works Department *Public Works Director* *Assistant Public Works Director*
5.1.4 Schedule of Implementation: • Ordinance is in place (Chapter 26, Article V) per Code of Virginia, § 15.2-2114, Local regulation of stormwater
5.1.5 Written policies and procedures utilized to ensure that stormwater management facilities are designed and installed in accordance with Section II B 5b: The following documents outline procedures: • Procedures for Site Plan Review: http://www.dumfriesva.gov/businesses/site-development • Site Plan Process: http://www.dumfriesva.gov/government/planningandzoning/site-plan • Design and Construction Standards Manual: The Town has adopted Prince William County's DCSM http://www.pwcgov.org/government/dept/development/ld/Pages/dcsm.aspx • Chapter 26, Article V of the Town Code describes the Stormwater Management 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

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

- Design & Construction Standards Manual

5.1.6 Written policies and procedures utilized in conducting inspections:

See documents listed in 5.1.5.

5.1.7 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:

See documents listed in 5.1.5.

5.1.8 Written procedures for inspection and maintenance of operator-owned stormwater management facilities:

The Town will establish a program for inspection and maintenance of stormwater management facilities owned by the Town in the form of a "Stormwater Post Construction Inspection Manual".

The manual will list all of the stormwater management facilities the Town is responsible for, by department, and include the following: type of stormwater management facility, the Town ID #, a periodic inspection checklist, and the annual inspection check list. The periodic inspection checklist is optional; however, departments will be encouraged to utilize them as stormwater management facilities are maintained. If deficiencies are found during maintenance, they are to be reported to the responsible party within the department, and repairs are to be scheduled.

The annual inspection checklist provided in the manual is to be used by the "Stormwater Inspection Staff" (led by the Public Works Director). These inspections will be conducted annually by Stormwater Inspectors and the results will be provided to the Public Works Director and the responsible person within the given department. If deficiencies are found during annual inspections, repairs will be budgeted and scheduled.

5.1.9 Annual Reporting Requirements:

- None, unless ordinance or procedures are amended.

BMP 5.2: Require long-term operation and maintenance of stormwater management facilities not owned by the Town

5.2.1 Description: The Town 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.

The Town provides developers with a template maintenance agreement in the Design and Construction Standards Manual (Section 720.15). The maintenance agreement requires that the owner submit to the Town an annual inspection report, along with one certified by a professional engineer every 3 years, to assure safe and proper functioning of the facilities.

If maintenance is neglected by the owner, the maintenance agreement allows the Town, after proper 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.

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

5.2.3 Responsible Employees:

Public Works Department
Public Works Director
Assistant Public Works Director

5.2.4 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 3

5.2.5 Annual Reporting Requirements:

- None, unless procedures amended.

BMP 5.3: Require long-term operation and maintenance of stormwater management facilities owned by the Town

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

Town departments are responsible for maintaining stormwater management facilities on properties they manage unless an alternative agreement has been established.

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

5.3.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director

5.3.4 Schedule of Implementation:

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

5.3.5 Annual Reporting Requirements:

- None, unless procedures amended.

BMP 5.4: Track stormwater management facilities

5.4.1 Description: The Town 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 Town 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 owned; and

(i) The date of the operator's most recent inspection of the stormwater management facility.

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:

Public Works Department
Public Works Director
Assistant Public Works Director
Public Works and Zoning Program Administrator

5.4.4 Schedule of Implementation:

- Track all new stormwater management facilities that require a maintenance agreement: Years 1-5
- Maintain list of all known Town-owned facilities: Years 1-5
- Inspect and verify details regarding Town-owned stormwater facilities: Years 1-3

5.4.5 Annual Reporting Requirements:

- Total number of inspections completed and, when applicable, the number of enforcement actions taken to ensure long-term maintenance.
- Submit an electronic database or spreadsheet of all stormwater management facilities brought online during each reporting year with the appropriate annual report.

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

BMP 6.1: Develop Written Procedures to Minimize or Prevent Discharges

6.1.1 Description: The Town of Dumfries shall develop and implement written procedures for daily operations designed to minimize or prevent discharges. Procedures shall be written for: daily street and parking lot maintenance, equipment maintenance, and pesticide, herbicide, and fertilizer application, storage and transport of materials.

6.1.2 Goals and Objectives: Written procedures for daily operations shall be designed to:

- Prevent illicit discharges
- Ensure the proper disposal of waste
- Prevent the discharge of vehicle wash water
- Require BMPs for discharging water pumped from construction and maintenance activities
- Minimize pollutant runoff from bulk storage areas
- Prevent pollutant discharges from municipal automobiles and equipment
- Ensure application of fertilizers and pesticides is conducted under manufacturer's recommendations

6.1.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director

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

6.1.4 Schedule of Implementation:

- Develop and implement written procedures for daily operations: Year 3
- Update written procedures as needed or required: Years 3-5

6.1.5 Annual Reporting Requirements:

- A summary report on the development and implementation of the 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 Town of Dumfries identified all municipal high-priority facilities. The Town 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 Town 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
Public Works Director
Assistant Public Works Director

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 3
- Update list of High Priority & High Potential Facilities as necessary: Years 3-5

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.

The following are the municipal facilities identified as either High Priority or High Priority with a Potential For Discharging Pollutants by the Town of Dumfries:

High Priority Facilities:

1. Public Works Shop Facility

6.2.6 Annual Reporting Requirements:

- None. Data available upon request.

BMP 6.3: Develop and Implement Specific Stormwater Pollution Prevention Plans (SWPPPs) for High Priority Facilities With a High Potential for Discharging Pollutants

6.3.1 Description: The Town of Dumfries shall develop and implement site-specific Stormwater Pollution Prevention Plans 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 and 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
Public Works Director
Assistant Public Works Director

6.3.4 Annual Reporting Requirements:

- Summary report on the development and implementation of all required SWPPPs

6.4: BMP Implement Turf and Landscape Nutrient Management Plans

6.4.1 Description: The Town of Dumfries shall implement turf and landscape nutrient management plans developed by a certified nutrient management planner on all lands owned or operated by the Town 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:

1. Ginn Memorial Park
2. Weems-Botts

The Town 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
Public Works Director
Assistant Public Works Director
Maintenance Crew

6.4.4 Schedule of Implementation:

- Identify all lands owned or operated by the Town where nutrients were applied to a contiguous area greater than one acre: Year 2
- Implement turf and landscape nutrient management plans for at least 30% of applicable lands: Year 3
- Implement turf and landscape nutrient management plans for at least 70% 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:

- Summary of the turf and landscape management plan (total acreage, acreage of lands upon which turf and landscape nutrient management plans have been implemented; and updated list of properties with longitude/latitude).

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

6.5.1 Description: The Town of Dumfries shall conduct stormwater training for municipal employees. Training shall be designed specifically for different departments and their duties and daily operations and how it relates to stormwater management. The Town 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:

1. Biennial training to field personnel in the recognition and reporting of illicit discharges
2. Biennial training to employees in good housekeeping and pollution prevention practices that are to be employed during road, street, and parking lot maintenance.
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.
4. Biennial training to employees in good housekeeping and pollution prevention practices that are to be employed in and around recreational facilities.
5. Ensure that employees and contractors who apply pesticides and herbicides are properly trained and certified in accordance with the Virginia Pesticide Control Act.
6. Ensure that plan reviewers, inspectors, program administrators, and construction site operators hold the proper certification as required under Virginia Erosion and Sediment Control Law.
7. Ensure that applicable employees obtain the proper certifications as required by Virginia Erosion and Sediment Control Law.
8. Emergency response employees shall have training in spill response.
9. Keep documentation on each training event including training date, number of employees attending, and the objective of the training event for a period of three years after each event.

6.5.3 Responsible Employees:

<u>Public Works Department</u>
Public Works Director
Assistant Public Works Director

6.5.4 Schedule of Implementation:

- Implement biennial training events: Years 2-5
- Ensure that pesticide and herbicide applicators hold proper certification: Years 3-5
- Ensure that plan reviewers, inspectors, program administrators, and construction site operators hold proper certification: Years 1-5
- Ensure that applicable employees obtain the proper certifications as required by Virginia Erosion and Sediment Control Law: Years 1-5
- Spill response training for emergency personnel: Years 2-5
- Keep documentation of training events: Years 2-5

6.5.5 Annual Reporting Requirements:

- Summary report on the required training, including a list of training events, the training date, the number of employees attending training and the objective of the training.

BMP 6.6: Require Municipal Contractors Use Appropriate Control Measures and Procedures for Stormwater Discharges to the MS4 System

6.6.1 Description: The Town of Dumfries shall require that municipal contractors use appropriate control measures and procedures for stormwater discharges to the MS4 system.

6.6.2 Goals and Objectives: To reduce or eliminate potential discharges from municipal contractors.

Oversight of municipal contractors will be the responsibility of Town inspectors or Town project manager(s). Include contract language in the Town's Terms & Conditions to ensure compliance. The document will be accessible on the Town webpage for download.

6.6.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Public Works Assistant Director
Public Works and Zoning Program Administrator

6.6.4 Schedule of Implementation:

- Develop new contract provisions requiring municipal contractors to use appropriate control measures and procedures for stormwater discharges to the MS4 system: Year 3
- Require municipal contractors use control measure and procedures for stormwater discharges: Years 3-5

6.6.5 Annual Reporting Requirements:

- Report on activities to develop procedures.

BMP 6.7: Street Sweeping

6.7.1 Description: The Town of Dumfries maintains a schedule to sweep every street at least monthly. Approximately half the streets are swept more than once per month, largely depending on the weather.

6.7.2 Goals and Objectives: To reduce or eliminate potential discharges from public rights-of-way.

6.7.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Maintenance Crew

6.7.4 Schedule of Implementation:

- Sweep all streets at least once per month: Years 1-5

6.7.5 Annual Reporting Requirements

- Summary report on activities.

BMP 6.8: Litter Pickup

6.8.1 Description: The Town of Dumfries has a dedicated part-time position for litter pickup. The position is able to remove litter from public rights-of-way and other public properties at least three days per week.

6.8.2 Goals and Objectives: To reduce or eliminate potential discharges from public rights-of-way.

6.8.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director
Maintenance Crew

6.8.4 Schedule of Implementation:

- Litter removal at least 3 days per week: Years 1-5

6.8.5 Annual Reporting Requirements:

- Summary report on activities

BMP 6.9: Snow and Ice Removal

6.9.1 Description: The Town of Dumfries shall require that any staff or contractors use appropriate control measures and procedures for stormwater discharges to the MS4 system.

6.9.2 Goals and Objectives: To reduce or eliminate potential discharges from public rights-of-way.

Oversight of any municipal contractors will be the responsibility of Town inspectors. Include contract language in the Town's Terms & Conditions to ensure compliance.

6.9.3 Responsible Departments/Employees:

Public Works Department
Public Works Director
Assistant Public Works Director

6.9.4 Schedule of Implementation:

- Use best available practices for snow and ice removal and the storage of the require materials: Years 1-5

6.9.5 Annual Reporting Requirements:

- Summary report on activities

Virginia Total Maximum Daily Load (TMDL) Special Conditions

The Town will work on developing the TMDL Action Plan to address pollutants which the Town's MS4 has been assigned a waste load allocation. This Plan will also include the Potomac River TMDL's for bacteria.

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, 2015 through June 30, 2016 Annual Report.

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 Town will work on developing the Chesapeake Bay TMDL Action Plan during the first three 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, 2015 through June 30, 2016 Annual Report.

Prior to the start of the 2018-2023 permit cycle, as part of the Town's reapplication package, the Town 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.

6. Appendices

Appendix A – Public Education & Outreach (MCM #1)

Public Education Outreach Program

A component of the

Virginia Municipal

Separate Storm Sewer System Management Program

Town of Dumfries, Virginia

Public Works Department

17755 Main Street

Dumfries, VA 22026

Adopted 12-1-15

Table of Contents

1.0 Introduction

The purpose of the Public Education Outreach Program (PEOP) is to identify the community involvement approach the Town of Dumfries will use to promote methods to reduce the discharge of pollutants in stormwater runoff. The Town of Dumfries' Public Works Department is responsible for coordinating the PEOP for the town's municipal storm sewer system (MS4) management program.

1.1 Goals

The Virginia General Permit for Discharges of Stormwater from Small MS4s (General Permit), published at 9 VAC-25-890-40 et al, has specific requirements for public education and outreach efforts. The Town of Dumfries obtained coverage under the 2013 General Permit as General Permit Number VAR040117.

As required in Section II, Part B. 1.b of the General Permit, this plan was designed with the consideration of the following goals:

- 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
- Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and
- Implementing a diverse program with strategies that are targeted toward audiences most likely to have significant stormwater impacts

1.2 Objectives

The PEOP outlines a plan for communicating with the people living and working within the Town of Dumfries that will support the Town's objective of achieving improved water quality through reduced pollutant loads entering water bodies through the Town's small MS4. Implementation of the actions described under this program will help the Town achieve the objective of improving water quality in the Town of Dumfries.

The PEOP complies with the General Permit requirements to:

- Identify, at a minimum, three high-priority water quality issues, that contribute to the discharge of stormwater and provide a rationale for the selection of these issues;
- Identify and estimate the population size of the target audience(s) associated with each high-priority water quality issue;
- Develop relevant message(s) and associated educational materials for message distribution to target audiences while considering minorities, disadvantaged audiences, and minors;
- Provide for public participation during PEOP development
- Annually conduct outreach activities designed to reach 20% of the target audience for each high-priority water quality issue. Failing to reach that goal is not considered a compliance issue unless "insufficient effort" is made to reach that goal; and
- Provide for the adjustment of target audiences and messages, including educational materials and delivery mechanisms to reach target audiences, in order to address any observed weaknesses or shortcomings.

2.0 Municipal Separate Storm Sewer System Stormwater Management Program

The Town of Dumfries is an operator of a Small Municipal Separate Storm Sewer System (MS4). A municipal separate storm sewer is defined as "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, 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 agency under § 208 of Clean Water Act 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 a part of a publicly owned treatment works"

The US Census in 2010 determined the Town's population to be 4,961, that the Town 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. Among the requirements of the permit, the Town of Dumfries must develop and implement a PEOP as one measure to prevent harmful pollutants from entering the Town's MS4. This document fulfills the requirement to develop a PEOP.

2.1 Background

Common stormwater pollutants that may be found in the Town of Dumfries MS4 area include bacteria from pet waste; chemicals contained in materials used on green spaces such as fertilizers; and chemicals contained in leaked, spilled or dumped materials such as oils, cleaners, paints, and pesticides.

2.2 Applicable Regulations

As a small MS4 operator, the Town of Dumfries is obligated to comply with the requirements set forth in the "General Permit for Discharges of Stormwater from Small Municipal Storm Sewer Systems", General Permit No. VAR040117, dated July 1, 2013. The permit establishes six "minimum control measures" (MCMs) to prevent stormwater pollution in the MS4:

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

The Town's MS4 Program Plan (which is updated annually) outlines specific actions, known as best management practices (BMPs), that the Town will use to address the six MCMs. The General Permit issued on July 1, 2013, mandate the preparation of a plan which addresses public education and outreach. Under this plan, there are opportunities for communicating with the people living and working in the Town of Dumfries that will support the broad goals of improved water quality through reduced pollutant loads entering water bodies through the Town's MS4.

3.0 Community Conditions

The Town of Dumfries in an incorporated town located in Northern Virginia and is surrounded by Prince William County. The Town comprises approximately 1.6 square miles of urban mixed land use development located approximately 25 miles south of Washington, D.C.

3.1 High Priority Water Quality Issues

The Town of Dumfries must identify at least three high-priority water quality issues, and provide rationale for their selection in accordance with the General Permit. The Town has identified four high-priority issues for this permit cycle.

3.1.1 Bacteria Impacts to Water Quality from Pet Waste

The EPA recommends E. coli as the best indicator of health risk from water contact in recreational waters. In urban areas, such as the Town of Dumfries, sources of E. coli include human fecal matter (in the case of poorly functioning wastewater treatment plants or septic systems) or animal fecal matter (both domesticated animals and wildlife). The Town of Dumfries has selected bacteria from pet waste as one of its four high-priority water quality issues on which public education and outreach efforts will focus. Section 5.1 of this document will provide the rationale for this selection.

3.1.2 Illicit Discharges from Commercial Automobile Washes

According to the Virginia Stormwater Management Program (VSMP) Regulations (9VAC25-870-10), illicit discharge is defined as "any discharge to municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a separate Virginia Pollutant Discharge Elimination System (VPDES) or state permit (other than the state permit for discharges from the municipal separate storm sewer), discharges resulting from firefighting activities, and discharges identified by and in compliance with 9VAC25-870-400." Illicit discharge detection and elimination (IDDE) is important because stormwater runoff from the Town of Dumfries' MS4 flows into streams and rivers without additional treatment. The Town of Dumfries has selected illicit discharges related to commercial automobile shops as the second high-priority water quality issue on which public education and outreach efforts will focus. Section 5.1 of this document will provide the rationale for this selection.

3.1.3 Illicit Discharges from Automobile Repair Shops

The Town of Dumfries has selected illicit discharges related to automobile repair shops as the third high-priority water quality issue on which public education and outreach efforts will focus. Section 5.1 of this document will provide the rationale for this selection.

3.1.4 Illicit Discharges from Restaurants

The Town of Dumfries has selected illicit discharges related to restaurants as the fourth high-priority water quality issue on which public education and outreach efforts will focus. Section 5.1 of this document will provide the rationale for this selection.

4.0 Current and Past Community Outreach Efforts

As noted in Section 2.2 of this document, the Town of Dumfries must meet the requirements in the Virginia General Permit for Discharges of Stormwater from Small MS4s. The Town has identified numerous BMPs to comply with the permit's MCMs to prevent stormwater pollution within the MS4. These actions are reviewed below.

4.1 Existing Program

The Town of Dumfries added a stormwater page to their website located at http://www.dumfriesva.gov/governmentpublic-worksmunicipal-separate-storm-sewer-system-ms4. The page is used to provide citizens with information about the stormwater program. Available on the page are annual progress reports, pollution reporting form, and other educational and environmental information. The Town is also a member of the Northern Virginia Clean Water Partners.

4.2 Existing Resources

The Town has conducted several community outreach activities in the past and has a variety of existing resources at their disposal including:

- Promotional material prepared by the Northern Virginia Clean Water Partners
- Outreach Handouts (About 100 of the following were distributed at the September 13, 2014 Fall Festival):
    - "Taking Care of Stormwater"
    - "Town of Dumfries, Virginia- How to Dispose of Leaves the Bay-friendly Way"

5.0 Public Education and Outreach Planning

Stormwater runoff is generated from various pervious and impervious surfaces such as roads, sidewalks, lawns, managed green spaces, driveways and roofs. Efforts to control stormwater pollution must take into account individual, household, business, and public behaviors and activities that can generate pollution coming from these surfaces. The purpose of outreach is to educate the public about the impact their actions can have on stormwater pollution, and to encourage changes in behavior to reduce future stormwater pollution. The goals of the PEO program are to educate the public by:

- 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;
- Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and
- Implementing a diverse program with strategies that are targeted toward audiences most likely to have significant stormwater impacts.

The following sections present the rationale used to develop the PEO program and the process to be followed to implement the plan.

5.1 High-Priority Water Quality Issues

The Town of Dumfries will focus on the four high-priority water quality issues identified in Section 3.2. The high-priority water quality issues, along with the rationale as to why they were selected, are presented in **Table 1** below.

Table 1. High-Priority Water Quality Issues

High-Priority Water Quality Issue	Rationale
Bacteria-Pet Waste	Bacteria from pet waste (such as E. Coli), has been identified as a significant concern that is contributing to impairments in waters in Virginia and the Town of Dumfries. There is a significant target population with whom to work within the Town.
Illicit Discharges- Commercial Automobile Washes	Improper discharges from car washes can result in the release of oil and grease, detergents, phosphates, debris and other hazardous chemicals to waters of Virginia and the Town of Dumfries.
Illicit Discharges- Automobile Repair Shops	Wastewater at auto repair shops is often generated by rinsing of parts and washing engines or dirty tools. Improper discharges from auto repair shops can result in the release of oil and grease, antifreeze, paints, and other hazardous solvents to waters of Virginia and the Town of Dumfries.
Illicit Discharges- Restaurants	Restaurants can be a significant source of illicit discharges into stormwater systems. Improper discharges from restaurants can result in the release of fats, oils, grease, debris, and hazardous chemicals to waters of Virginia and the Town of Dumfries.

5.2 Target Audiences

Population characteristics of the Town of Dumfries MS4 were evaluated to identify the Town populations to be reached by the education and outreach effort. Target audiences were selected through an assessment of the Town's community profile. The target audiences for stormwater outreach are shown in **Table 2** below.

High-Priority Water Quality Issue	Topic of Concern	Target Audience	Size
Bacteria- Pet waste	Pet waste	Homeowners and residents with pets	575 dogs (36.5% of US households x 1573 households)
Illicit Discharges- Commercial Auto Washes	Proper disposal of wastewater and debris	Commercial auto washes within the Town of Dumfries MS4	2
Illicit Discharges- Auto Repair Shops	Proper disposal of wastewater and hazardous chemicals	Auto repair shops within the Town of Dumfries MS4	24

Illicit Discharges-Restaurants	Proper disposal of fats, oils, grease, and other hazardous chemicals	Restaurants within the Town of Dumfries MS4	15

Pet Waste- To reduce levels of bacteria, the focus will be on pet waste from dogs. The Town has approximately 575 registered dog owners in the MS4 permit area.

Commercial Auto Washes- Proper disposal of wastewater and chemicals from commercial auto washes will be the focus of illicit discharge control. There are approximately 2 auto wash companies in the MS4 permit area.

Auto Repair Shops- Proper disposal of wastewater and chemicals from auto repair shops will be another focus of illicit discharge control. There are approximately 24 auto repair shops within the MS4 permit area.

Restaurants- Proper disposal of fats, oils, grease, and wastewater from restaurants will also be a focus of illicit discharge control. There are approximately 15 restaurants located within the MS4 permit area.

5.3 Plan Implementation

A variety of actions will be conducted to educate the public in attempts to change behavior within the Town's permitted MS4 area. Actions will be focused on targeted audiences and high-priority water quality issues identified in this implementation plan. The framework for action was introduced in **Table 2**, details for implementation are provided below.

5.3.1 Actions and Messages

The messages developed for public education and outreach will be provided in both English and Spanish language versions. Attention will be given to developing informative, easily-understood materials.

Pet Waste

Written Materials- A trifold brochure that presents the impact animal waste can have on water quality will be developed.

Active Engagement- In-person presentations for selected targeted audiences will be provided.

The brochure will address pet waste as a major source of the bacteria found in waters within the Town that needs to be reduced. Topics that will be addressed: Why pet waste is a concern; how it can impact local water by affecting bacteria levels; and simple ways to keep pet waste out of water. Local contact information and sources for additional information will be included.

Commercial Automobile Washes

Written Materials- A set of take-home training handouts for recipients of the training.

Active Engagement- In-person training for auto wash companies within the Town of Dumfries.

The training information will address the basics of stormwater runoff and how improper water discharges to the storm sewers contribute to the degradation of water quality in nearby waters. Training materials will include: why car washes are a concern and how they can impact local water; how to

manage and discharge wastewater; and ways to make car washes more environmentally friendly. Local contact information and other sources for additional information will be provided. **Automobile Repair Shops**

Written Materials- A set of take-home training handouts for recipients of the training.

Active Engagement- In-person training for auto repair shops that operate within the Town of Dumfries.

The training for auto repair shops will address the basics of stormwater runoff and how improper control of chemicals and discharge of wastewater can contribute to the degradation of water quality in nearby waters. The training materials will include the do's and don'ts for disposing of hazardous waste, discharging wastewater, and managing spills.

Restaurants

Written Materials- A set of take-home training handouts for recipients of the training.

Active Engagement- In-person training for restaurants that operate within the Town of Dumfries.

The training information for restaurants will address the basics of stormwater runoff and how improper disposal of waste from food preparation can contribute to the degradation of water quality in nearby waters. Training materials will include: how restaurants can be a source for illicit discharge, how to dispose of waste properly; and how to prevent accidental contamination. Local contact information and other sources for additional information will be provided.

5.3.2 Format and Distribution

Brochures will include visually appealing graphics and will provide information in easily understood terms. Use of existing themes developed under previous Town outreach efforts will be continued and where appropriate supplemented with new or additional color schemes, graphics, and slogans. These features will be used throughout the Town's stormwater education and outreach efforts. Repeating themes enhances the familiarity of the community with messages related to stormwater management and thus the same themes will be used to develop training materials for commercial automobile washes, automobile repair shops, and restaurants.

Brochures will be distributed to HOAs within the MS4 permit area along with a cover letter explaining the importance of the brochure and its intended use. Follow-up with communication with HOA points of contact will be critical to ensuring effectiveness.

5.4 Public Participation

The Town's MS4 permit also requires that the public be given the opportunity to participate in the development of the PEOP. Expanded education and outreach requirements must be implemented for the remaining years of the permit. Each year, there must be an evaluation of the strengths and weaknesses of the education and outreach effort improvements, if any, that will be implemented in the next permit year.

5.4.1 Involvement of the Community in Program Development

As noted in Section 1.2 of this plan, there are a number of required actions specified in the permit related to the public education and outreach. This plan provides for these actions as stated in the previous sections. Input from the community can help to increase the success of education efforts.

Citizens are invited to give input on ideas about how the Town can inform the public of best management practices related to stormwater. Opportunities for public input are advertised to improve citizen awareness.

5.5 Evaluation

The methodology for evaluating the effectiveness of the education and outreach program is provided in this section. Despite best efforts, there is usually room for improvement once the program has been implemented. Program success requires continued evaluation and modification where necessary.

A planned evaluation process is necessary to record strengths and weaknesses encountered during program implementation. Observations and evaluations will be made and feedback will be sought and documented at the following key points in the process:

1. Planning and Development- time during which activities and educational tools are identified, developed, and scheduled;
2. Execution of Actions- time during which planned activities and educational tools are conducted and introduced to community;
3. Target Audience Feedback- time during which members of the targeted audience provide feedback regarding their understanding of the need to change behavior;
4. Behavior Change and Evaluation Period- time during which the Town observes improved conditions within a targeted audience related to stormwater pollution.

Feedback during the planning and development period may indicate the need to add additional audiences or alter the way educational material is presented. Activities may need to be changed to better address the needs of the Town or of the targeted audience.

During the execution of actions stage, feedback regarding general difficulties encountered and responsiveness from targeted audiences will be recorded.

After the first year of conducting education and outreach activities on stormwater pollution reduction, feedback from targeted audiences will be formally sought. Short surveys seeking input should be developed and distributed. For the auto washes, auto repair shops, and restaurants, surveys can be distributed to the points of contact established for each business.

There will be an organized formal effort to determine the percentage of the target audience reached in any given year, along with how effective that communication was in changing behavior. Observed changes will be recorded and reported. The evaluation process will identify strengths and weaknesses associated with the POE program. Significant changes identified during this process will be made as soon as possible or at the end of each annual review cycle. Minor issues will be considered and addressed immediately when appropriate.

5.6 Additional Opportunities for Education and Outreach

The Town of Dumfries' Public Works Department is fully committed to maintaining compliance with its MS4 Permit requirements. The PEOP is designed to guide the Town through the required steps to increase target audience knowledge about stormwater pollution reduction. The PEOP was developed to address the MS4 Permit requirements for MCM 1, as noted in Section 2.2. Other education and outreach steps may be taken to supplement other aspects of permit compliance and to improve water

quality in the Town. The Town will revise and adapt the PEOP throughout the permit term in order to address noted weaknesses or shortcomings.

Appendix B – Illicit Discharge Detection & Elimination (MCM #3)

2.4 Standard Operating Procedures for Snow and Ice Removal

The following SOP shall be followed for snow and ice removal during inclement weather. The Town of Dumfries requires any staff or contractors to use appropriate control measures during snow and ice removal to minimize discharges to the MS4 system.

Responsible Parties: Department of Public Works

Practices and Procedures:

- Before leaving the Public Works' Shop, check all vehicles to be used for leaks. Be sure to follow the equipment maintenance and washing procedures outlined in Section 2.1 of this handbook.
- The Town will use the lowest application rate of salt and sand to effectively treat surfaces to meet safety needs while minimizing negative impacts on water quality.
- Roads will be continuously plowed and sanded during a snow event to keep roads safe for motorists.
- After a snow event, crews will inspect roadways to determine necessary maintenance actions.
- Snow should not be piled on or near storm drains.
- Loading areas shall be swept frequently to prevent build-up of sediment
- When applying salt/sand, operator should take notice of proximity to surface waters to prevent materials from entering waterways during application.
- Storage of deicing materials:
    - Salt, sand, and other deicer materials must be stored away from storm drain inlets and other conveyance structures.
    - Salt and other chemical deicers will be stored in a covered structure or container at all times. Temporary stock piles must be covered with a tarp and secured at all times when not being used.
    - Salt and other chemical deicers will only be stored on an impervious surface such as a concrete slab.

Employee Training:

Employee training must include: preventative maintenance and good housekeeping practices, proper fueling procedures; material handling including spill prevention and response. The General Permit requires biennial training for all good housekeeping practices.

3.0 Standard Operating Procedures for Illicit Discharge Detection and Elimination (IDDE)

The General Permit requires the Town of Dumfries to develop and implement written procedures to detect, identify, and address unauthorized nonstormwater discharges, including illegal dumping to the MS4. The procedures outlined in the following subsections fulfill these requirements.

3.1 Written Dry Field Screening Methodologies:

The MS4 permit requires annual dry screening of outfalls from Dumfries' MS4. The Town has more than 50 known outfalls and thus is required to inspect a minimum of 50 outfalls each year. Dry screening inspections will be defined as inspections performed when precipitation is less than 0.5 inches within a 48-hour period. Inspections of outfalls are to be performed by trained Town staff. Annual reporting requirements and procedures for inspections are detailed below:

Annually report to DEQ:

- Number of outfalls inspected
- Screening results
- Detail of any follow-up actions necessitated by screening results

Pre-Inspection Instructions

It is important to conduct outfall screening inspections during dry weather. Dry weather screening is preferable because presence of dry weather flow may suggest that there is an illicit discharge or connection and further investigation will need to be conducted. Dry weather flow may not indicate a problem if it is originating from an allowable or conditionally allowed nonstormwater discharge (Town Code Sec. 26-185(b)). Prior to performing inspections, check to see if the area is experiencing dry weather conditions:

1. Go to http://weather.gov.
2. In the search box on the left hand side of the page, type in Dumfries, VA.
3. On the right hand side of the page, under More Information, click "3 Day History."
4. Note whether any precipitation was recorded for the past three days.
5. Note the time and quantity of last rain on the outfall inspection form.

Inspection Instructions:

1. Walking from downstream to upstream (in the stream so as not to disturb water or sediments which could alter assumptions of an outfall) inspect outfalls one at a time.
2. On the outfall inspection report form, note:
    a. Date and time of inspection
    b. Outfall number
    c. Name of staff performing inspection
    d. Site descriptions, see regulations
    e. Estimated discharge
    f. Visual observations: odor, color, clarity, floatables, deposits or stains, vegetation condition, structural condition, biology- good/bad designations for each
3. If the outfall has dry weather flow, take photos and collect a water sample.
4. Label each sample bottle with the appropriate outfall ID, data and time of collection, and sample collector initials.
5. Follow Table 1 for general information regarding sample holding times and methods.
6. An illicit discharge investigation will be conducted if any of the following apply:
    a. The overall outfall characterization is determined to be "suspect" or "obvious."
    b. On-site or lab water testing results in values exceeding the thresholds indicated in Table 2.

Table 1. Holding Times for Water Samples

Parameter	Holding Time	Holding Methods
Bacteria	6 hours	Cool, 4 ^{o}C
Ammonia	Process immediately	Can preserve with sulfuric acid & hold for 28 days
Fluoride	28 days (HDPE plastic container only)	Cool, 4^{o}C
Anionic Surfactants	2 days	Cool, 4^{o}

Potassium	6 months	Frozen
Total nitrogen/Total phosphorus	24 hours 30 days	Cool, 4°C Frozen below -20°C
pH	Process immediately	
Temperature	Process immediately	

Table 2. Dry weather outfall screening water quality indicators.

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater, or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

7. If an outfall is suspected to have an illicit discharge, document the outfall/illicit discharge and fill out the illicit discharge reporting form. Any suspected discharge shall be addressed according to the illicit discharge procedures. Additionally, the following procedures apply to suspected discharges at an outfall:
    a. The investigation should commence within 15 days of the initial identification of any observed continuous or intermittent potential illicit discharges.
    b. Potential illicit discharges from sewage or that are "significantly contaminated" shall be prioritized.
    c. The outfall should be visited three additional times during the permit cycle to determine if an intermittent discharge is present.
8. Outfall inspection data will be documented by the MS4 Coordinator and saved on the Public Works Drive (Public Works>Stormwater>MS4 Program> Illicit Discharge Detection and Elimination> Outfall Inspections).

3.2 Prioritization Schedule:

The Town estimates that the MS4 contains approximately 63 outfalls that discharge to Quantico Creek. Detailed mapping of the Town's MS4 showing locations of outfalls and interconnections with VDOT and Prince William County School's MS4s has been developed (Appendix C). Section II.B.3.c (1) (a) of the General Permit requires the Town to develop a prioritized field screening schedule of areas most likely to contain illicit discharges. Outfalls located along Canal Road will be prioritized because that is an industrialized area of the Town and is more likely to have illicit discharges. Those outfalls will be screened annually and include outfall AA, AB, 54, 44, AC, and 15. The Town's Outfall prioritization schedule will be modified as land use within the Town changes or as incidents occur that will require an area to be prioritized.

3.3 IDDE Investigation Procedures:

The Town of Dumfries has designated an Illicit Discharge Detection Inspection Team as a component of the IDDE Investigation Process. The Illicit Discharge Detection Inspection Team is composed of the MS4 Program Coordinator, Public Works Director, Public Works Assistant Director, and Field Support Team. For each investigation, a Lead Investigator will be appointed. The Lead Investigator may be any member of the inspection team, other town staff, or other agency such as the Virginia Department of

Environmental Quality (DEQ). The appropriate process for IDDE investigation and documentation is outlined below:

Investigation and Documentation Process:

1) Report of IDDE event received by town staff (report may have been received by phone, in person, email, etc.)

2) Staff forwards information to illicit discharge inspection team who will fill out illicit discharge reporting form (Appendix B). A lead investigator will be assigned.

   a) Rainfall data may be taken from online source.
   b) For form:
      i) Names: Name to match town staff email addresses.
      ii) Incident location.

3) During investigation, the illicit discharge team will update the Investigations folder (Public Works> Stormwater> MS4 Program > Illicit Discharge Detection and Elimination> Investigations) on the Town's Public Works drive with documentation, photos, letters, emails, etc. associated with the IDDE event.

   a) Within the Investigations folder, a new folder will be created for each investigation of an IDDE event.

   b) Files saved in the folder will be saved by [date investigation initiated year – month -day] [other additional title]. Examples:

      i) 2014-02-06 IDDE Report Form.pdf

      ii) 2014-02-06 Investigation Notes.docx

   c) A time frame upon which to conduct an investigation or investigations to identify and locate the source of any observed continuous or intermittent non-stormwater discharge to be prioritized as follows per MS4 permit: (i) illicit discharges suspected of being sanitary sewage or significantly contaminated must be discharged first, (ii) investigations of illicit discharges suspected of being less hazardous to human health and safety such as noncontact cooling water or wash water may be delayed until after all suspected sanitary or significantly contaminated discharges have been investigated, eliminated, or identified. Discharges authorized under a separate VPDES or state permit require no further action under this permit.

   d) If an illicit discharge is found, but within six months of the beginning of the investigation neither the source nor the same non-stormwater discharge has been identified, then this shall be documented.

   e) If the observed discharge is intermittent, then Lead Investigator must document that a minimum of three separate investigations were made in attempt to observe the discharge when it was flowing. If these attempts are unsuccessful, the operator must document.

f) The investigator will conduct on-site or lab water testing as necessary to determine the source of the illicit discharge (see section 3.4).

Table 1. Water Quality Indicators

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

g) The MS4 Coordinator will track suspected illicit discharges in a spreadsheet (Table 2) to ensure the appropriate follow-up steps are taken.

h) Follow the procedures outlined in Section 3.4 to determine the source of the illicit discharge.

i) Upon determination of the source, the Town will notify the apparent responsible party that a violation of the illicit discharge detection and elimination ordinance exists. If voluntary compliance cannot be achieved within an established timeframe, the program administrator may initiate formal enforcement action as specified in the IDDE ordinance.

j) After the illicit discharge has been removed from the subdrainage areas, that area must be re-inspected to verify all necessary corrections have been made.

   i) Dependent upon the extent of corrections, verification monitoring may be done at the initial junction manhole or closest downstream manhole.

   ii) Verification is accomplished using the same visual inspection procedures utilized during outfall inspections.

k) Investigators may use the Center for Watershed Protection's publication as guides, http://www.cwp.org/online-watershed-library/cat_view/64-manuals-and-plans/79-illicit-discharge-detection-and-elimination:

   i) Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments

   ii) Illicit Discharge Detection and Elimination: Technical Appendices

   iii) Illicit Discharge Detection and Tracking Guide

4) When IDDE event is "closed", the Lead Investigator will complete the illicit discharge inspector form.

5) IDDE Form will be forwarded to the MS4 Coordinator.

6) The illicit discharge inspection form will be included with the MS4 Annual Reports, as it will include required information: (i) date that 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.

3.4 Methodologies to Determine the Source of the Illicit Discharge

Source tracing begins when a suspected illicit discharge is identified through field assessments/testing or complaint call. When the source of the non-stormwater discharge is unknown, the following investigation techniques can be used to locate the source of an illicit discharge:

Storm Drain Network Investigations- systematic testing and inspection of junction manholes in continuous upstream or downstream manner. This investigation method will include the following steps:

1. Consult the drainage system map and identify major branches.
2. Starting from the outfall, observe and take probe readings at the next upstream manhole or junction to determine if there is any evidence of polluted discharge. Field crews should be looking for presence of flow during dry weather conditions, foul odors, colors or stained deposits, oily sheen, floatable materials, and/or unusual probe readings.
3. Repeat observations at each upstream manhole/junction until a junction is found without evidence of polluted discharge. The discharge source will likely be located between the junction without evidence of polluted discharge and the next downstream junction.
4. Work downstream from the "clean" manhole/junction to isolate the source of the polluted discharge entering the storm drain system.
5. If discharge is evident from a private property, follow the inspection procedures outlined in Section 26-186 of the IDDE Ordinance.
6. Document all findings and file according to the Investigation and Documentation Process outlined in section 3.2.

Drainage Area Investigations- An initial analysis is performed to determine potential generating sites by reviewing land uses followed by inspections or testing in areas where the illicit discharge appears to be specific to a certain type of land use or generating site.

1. Staff should make a list of likely discharge sources and consult drainage system maps to identify points of entry for pollutants.
2. Field crews should then conduct a survey of the drainage area to identify and confirm potential sources of the illicit discharge.
3. Town staff should conduct individual site inspections to locate the specific source of the discharge once potential discharge sites are identified.
4. Dye testing may be necessary to confirm a suspected activity is actually draining into the storm drain network. The use of dye tracers must be approved by the Department of Public Works in accordance with DEQ standards and regulations.

The method used will depend upon the type of information collected or reported, the drainage network, and any knowledge of operations/activities on the surrounding properties. The Illicit Discharge Report Form (Appendix B) will be used to document all source tracing investigations.

Water Quality Testing. All identified dry-weather discharges will be tested using commercially available water quality test meters or analyzed according to EPA-approved laboratory analysis methods. In addition to information required by for the IDDE form, all inspections shall be documented with photographs. If a flow is present, grab samples shall be taken and tested either in field or lab for the following indicator parameters:

- pH
- Conductivity
- Fluoride
- Surfactants

Field inspectors will be trained to conduct water quality sampling. Field instruments will be calibrated prior to use. All equipment shall be cleaned and serviced at the end of field investigations and according to manufacturer's standards.

Table 1 describes indicator parameter levels which may indicate the presence of an illicit discharge. Further lab testing for additional parameters, such as fecal coliform, may be required to confirm a suspected source. References such as the Center for Watershed Protection's Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments shall also be consulted to identify potential sources based upon field observations and initial results.

Table 3. Water Quality Parameter Thresholds

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

3.5 Follow-up Investigations

Once the source of an illicit discharge has been identified, the Town will notify the property owner or operator in writing about the problem. The written notification will include a deadline to correct the illicit discharge along with any of the requirements outlined in Section 26-190 of the IDDE Ordinance. A follow-up investigation will be conducted after the deadline set forth in the property owner's notification to verify compliance to correct the identified illicit discharge. As outlined in Section 26-190 of the IDDE Ordinance, if the operator fails to comply within the allotted time period, the Town Manager will designate a governmental agency or contractor to fix the problem at the violator's expense.

3.6 Continued Identification of Other Points of Discharge

To date, the Town has identified downstream interconnections with Prince William County and the Virginia Department of Transportation's MS4s. The Town will continue to identify other points of discharge if interconnections are clarified or the Town becomes aware of new interconnections in the future. If the Town becomes aware of an interconnection with a downstream MS4 that the Town had not previously notified regarding the interconnected systems, the Town will send a notice in writing to that MS4. The Town will continue to update its outfall map as unmapped outfalls are identified or other changes occur.

4.0 Inspection and Maintenance Procedures for Stormwater Facilities

4.1 Inspection Procedures

The quality of stormwater entering local, state, and federal waters depends on appropriate operation and maintenance of best management practices (BMPs). Stormwater management facilities must be regularly inspected to ensure that BMPs are functioning properly. It is important to inspect BMPs post-construction to ensure that they have been installed properly. The following procedures should be adhered to when performing post-construction inspections for BMPs:

1. Inspections will be performed by the Town's Public Works Department at the time of construction completion.
2. Using the approved plans, walk the site to determine if BMPs are installed properly.
3. Fill out the Stormwater Facility Inspection Form (Appendix D) and record any observed violations.
4. Discuss any observed violations that require corrective actions with the Director of Public Works.
5. Corrective measures will be completed within a reasonable timeframe as determined by the Director of Public Works. A written notice of violations with a deadline to comply will be sent to the project operator.
6. If compliance is not met within the designated timeframe, the enforcement procedures outlined in Section 26-165.13 of the Town Code.

Routine inspections also help to determine appropriate maintenance required for the facility. The procedures outlined below should be followed when inspecting stormwater facilities:

1. All stormwater facilities owned by the Town will be inspected on an annual basis to ensure they are operating properly and to determine any maintenance needs.
2. The Town will implement a schedule for inspecting all privately owned BMPs that discharge to the MS4 at least once every five years.
3. The Stormwater Facility Inspection Form (Appendix D), will be utilized during the inspection.
4. Review any on-site records such as site plans, stormwater management plans, spill prevention and response plans, etc.
5. Complete thorough walkthrough of the property. Inspector should look for:
    a. On-site BMPs
    b. Indicators or presence of illicit connections or discharges
    c. Evidence of past spills
    d. Material handling and storage areas (including loading and unloading areas)
    e. Equipment fueling and maintenance areas
    f. Storm drain structures and receiving streams

Appendix C – Post-Construction Stormwater Management in New Development and Development on Prior Developed Lands (MCM #5)

STORMWATER POST CONSTRUCTION INSPECTION MANUAL

Town of Dumfries, Virginia

Town of Dumfries, VA
Revised: 6/21/2016

Contents

1. Introduction

The information included in this manual is to be used as a reference for inspections of Stormwater Management (SWM) facilities (also referred to as Best Management Practices (BMPs)) owned by the Town of Dumfries. The manual includes a list of all SWM's owned by the Town along with the following information: the type of SWM, the GPIN and address, a periodic inspection checklist, and the annual inspection checklist. This information will be used by the Town throughout the year as Town staff visit, maintain, and inspect these facilities.

The Town's Municipal Separate Storm Sewer System (MS4) permit requires annual inspections of all Town-owned stormwater management facilities. These inspections must be documented and submitted with each annual report. The permit does not require the Town to document any periodic inspections however Public Works encourages field staff to utilize them as they maintain each of the facilities listed in this manual. These checklists should be completed each time a BMP is maintained. Maintaining a BMP includes emergency maintenance, routine maintenance (grass cutting, mulching, winter operations, etc.) and the monitoring of upstream and downstream areas around the facility. If any deficiencies are found during periodic inspections, they should be reported to the Public Works Director or MS4 Coordinator, and repairs should be scheduled. After the BMP has been repaired, a subsequent checklist should be completed noting that the previous deficiency has been corrected. All completed checklists will be maintained on file by Public Works.

The annual inspection checklist that is included in this manual will be used only by the Stormwater Inspection staff (led by Public Works Director). These inspections will be conducted once a year by a certified Inspector and will be included in the MS4 Annual Reports. These checklists have been included as a reference for staff to better understand what the Stormwater Inspection staff will be looking for during annual inspections.

Any questions concerning SWM maintenance or inspections listed in this manual should be directed to the Public Works Director or MS4 Coordinator.

2. Town Contact Information:

Public Works Department
Title: Public Works Director Name: Richard West Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 ext. 119 Email: rwest@dumfriesva.gov
Title: Assistant Public Works Director Name: Terry Meyers Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 ext. 117 Email: tmeyers@dumfriesva.gov
Title: Public Works and Zoning Program Administrative Assistant Name: Yvette Ragland Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 ext. 116 Email: yragland@dumfriesva.gov
Title: MS4 Coordinator Name: Shaina Schaffer Address: 17755 Main St. Dumfries, VA 22026 Phone: (703) 221-3400 ext. 118 Email: sschaffer@dumfriesva.gov

3. Summary of BMP Operations and Maintenance

The following subsections detail the necessary tasks associated with maintaining the Town's BMP facilities. In addition to this information, the Virginia Stormwater Management Handbook may also be used as a reference. The handbook can be found at: http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx.

Routine Debris and Litter Removal

Regular debris and litter removal is integral to BMP maintenance. A spring cleanup is typically needed to remove trash from all surface BMPs. Beyond that, periodic inspections will help to determine when further trash removal is required. Special attention should be given to removing floating debris, which can clog the outlet device or riser. Routine debris and litter removal is worth the effort as it 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.

Sediment Removal and Disposal

Sediment gradually accumulates in BMPs and will eventually need to be removed. The necessary removal intervals can vary drastically depending on several different factors including the following:

- The type of BMP;
- The design storage volume (e.g., if the active and permanent pool 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 a BMP is installed, the designer should estimate the lifetime sediment accumulation that the BMP will have to accommodate. Expected changes to land use in the watershed should also be considered. The designer should determine a sediment accumulation rate and the amount of sediment storage volume that is inherently provided in the BMP without altering the treatment efficiency or stormwater storage volume.

The frequency of sediment removal will be based upon the sediment accumulation rate versus the amount of storage volume that is provided in the BMP without changing the treatment efficiency or stormwater storage volume. The frequency of sediment removal will be both BMP and site-specific.

Wet sediment is more difficult and expensive to remove than dry sediment. Typically, it is not feasible to drain the entire facility and allow time to dry so that heavy equipment can operate on the bottom. Where feasible, provisions for draining permanent pools should be incorporated in the design of water impoundments. Additionally, low-flow channels and outlets should be utilized in BMPs to bypass stormwater flow during BMP maintenance. In many cases, periodic rainfall will keep sediment soft and

thus not enable the use of heavy equipment. In such cases, sediment may have to be removed from the shoreline by using backhoes, grade-alls, or similar equipment.

Sediment removed from a BMP requires proper disposal and must be carefully planned. Generally, wastewater plants do not accept wastewater with solids while sanitary landfills may not accept liquids or saturated sediments. Sediment removal activities must produce waste that can meet the relevant disposal requirements. State disposal requirements should also be consulted. Typically, sediment removed from BMPs is not contaminated to the point that it would be classified as hazardous waste however, all sediment removed should be tested to determine the proper disposal. Generally, there are three sediment disposal options:

- **On-site disposal**- Allows the sediment to be disposed of on an unregulated area (i.e. land other than floodplain). This area should be designated during the site planning process. The areas utilized for on-site sediment disposal should also be landscaped after each sediment removal disposal to stabilize the soil.
- **Off-site disposal**- Often preferred by developers and municipalities because it does not reduce the developable area, does not require landscaping/grading, and there are no perceived liability/health concerns to surrounding landowners. Temporary on-site disposal areas are recommended to allow sediment to de-water. If temporary on-site disposal areas are not feasible due to limited availability of land, this must be detailed in the SWM plan.
- **Hazardous waste disposal**- Sediment removed from BMP is expected to contain contaminants (such as metals, bacteria, nutrients), however the level of pollutants is typically not sufficient to classified as hazardous waste. If testing determines the sediment is classified as hazardous waste, it must be disposed of at a hazardous waste facility using licensed haulers.

Stability and Erosion Control

Healthy ground cover in and around the BMPs is the best way to promote soil stability and erosion control. Areas of bare soil quickly erode which can clog the BMP and degrade its functionality. It is important to stabilize bare areas as quickly as possible. Newly seeded areas should be protected with mulch and/or erosion control mats.

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

The growth of young trees and shrubs can result in unstable embankments. Regular mowing of embankments controls seedlings that take root. Outside of the embankment area, trees and shrubs are not a threat to embankment stability and can provide important filtering benefits however they should not be planted within the maintenance and access areas.

Embankments may also be destabilized by animal burrows. Appropriate efforts to control animal burrows much be taken.

Subsidence can result in sinkholes on embankments or basin and channel bottoms. Subsidence or sinkholes within the perimeter of the BMP or along the treatment train can short-circuit the stormwater management system and should always be considered as a BMP failure that must be addressed and corrected.

Vegetation Maintenance

Maintenance of vegetation is another important component of stormwater maintenance. The grasses and plants within all BMPs require regular attention. Particular attention must be given to vegetative BMPs such as filter strips, dry and wet swales, grass channels, restored riparian buffers, bioretention facilities, and constructed stormwater wetlands. Bare spots, rills, and damaged vegetation indicate that the BMP is not functioning properly.

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

Soil within vegetated areas should be tested every other year to determine any necessary adjustments to sustain vigorous plant growth. Soil aeration is recommended filter strips and grassed swales where sediment accumulation rates are expected to be high. Vegetative cover should be mown infrequently, to provide for the development of thick stands of tall grass and other vegetation. Pedestrian traffic through vegetation should also be prevented.

Areas immediately upstream and downstream of some vegetative BMPs may experience increased erosion. All erosion issues should be repaired immediately to prevent the problem from spreading.

Table 1 describes some of the vegetation-specific maintenance activities at various BMP types. It is important to remember that there are specific requirements related to certain management practices that must be followed. Additionally, vegetation maintenance activities naturally change as vegetation matures after BMP construction.

Table 1. BMP Vegetative Maintenance

Maintenance Activity	Procedures
Replacement of Dead Plants	Dead plants should be removed and disposed of. If plants have died on a large scale, the cause should be investigated before the plants are replaced.
Fertilization	Fertilization at a BMP is done to secure optimum vegetative growth rather than to increase yields. Infertile soils should be amended prior to planting. Soil sampling will determine when and how much fertilizer may be required after planting.
Irrigation/Watering	Watering is typically necessary during the germination period. Watering may also be necessary to preserve vegetation during drought conditions. Water may be pumped from the BMP pool or stream or portable water trucks may be used. Additionally, a permanent irrigation system may be installed if necessary.
Mulching	Mulch helps maintain soil temperature and moisture while also improving aesthetics. A ½ inch layer is typically adequate.
Weeding	During the first growing season, weeding is often necessary. Beyond the first season, weeding will be done as needed to prevent invasive or undesirable species from out-competing plants that were planted to treat stormwater.
Cultivating/Hoeing	It may be necessary to loosen overly compacted soils with a hoe.
Pruning	Pruning is used to shape plants and remove any dead wood. Primarily pruning is conducted for aesthetic purposes.
Thinning	Particular species need thinning to thrive, reduce flow obstructions, and to allow maintenance staff to access the entire BMP.
Staking	Stakes should be kept in place for 6-18 months to allow proper development of saplings. The condition of the stakes and ties should be checked periodically and care should be taken to ensure the sakes/ties to no damage the tree's roots or trunk.

Wound Dressing	Broken/damaged branches and other wounds on trees should be dressed according to recommendations from a trained arborist.
Disease Control	Insecticides or organic means of pest and fungal control may be required if such issues are observed.
Protection from Animals/Pedestrians	Fencing and signage should be used to protect vegetation from damage due to pedestrian traffic. This is especially necessary during early stages of plant installation. Wildlife damage is caused by animals browsing and grazing the plants however chemical repellants should not be used. Fences and mesh may be used to deter entry. Tree tubs may also be used to protect individual specimens.
Mowing	Mowing of perennial herbaceous grasses and wildflowers can promote redistribution of seed however mowing should be carefully controlled. Grasses associated with BMPs should never be mown more than once each year. It is important to focus on helping surrounding property owners to learn more about BMPs which will help with their perception of BMP aesthetics.

Grass Cutting

Generally, grass-cutting should be limited or eliminated around SWM facilities. Allowing grass to grow can help enhance water quality and provide other benefits for wet facilities. Additionally, short grass around a wet stormwater facility can provide an ideal habitat for nuisance species such as geese. Grass cutting is primarily undertaken to enhance the aesthetics of the facility and the frequency will depend upon surrounding land uses and local policies. Grass cutting should be done as infrequently as possible but also take into account aesthetic concerns of nearby residents. As a safety precaution, cutting should be done parallel to the shoreline with grass clippings being released upland to avoid increasing organic matter in the pond.

Weed Control

Weeds are typically defined as unwanted vegetation in a particular area. In terms of BMP maintenance, weeds will generally include invasive species which cannot provide the intended function of the planting strategy or for which the non-native species spread is undesirable.

Weed control may be required annually. Ideally weeding should be done by hand to prevent damage of surrounding vegetation. Pesticides and herbicides should never be used around a BMP.

Plantings

Both upland and flood fringe plantings are generally stable and should not need much maintenance. Shoreline fringe areas are subject to harsher conditions due to frequent wetting and drying associated within this zone. Aquatic plantings are the hardest to initially establish. Vegetation within the aquatic and shoreline fringe may need some replanting or enhancements during the first year or two of SWM facility operation.

Planting methods can be separated based upon the following three main categories based upon differences in saturation levels and types of vegetation that will grow under those conditions:

- **Upland/Flood Fringe**- Within the upland/flood fringe area, herbaceous (ground covers and grasses) and woody vegetation (shrubs and trees) plantings are used. Planting should occur in the spring after groundwater levels have normalized. Ground cover may be installed through hydro-seeding or using a custom seed mix in a nutrient rich

medium within a biodegradable mesh-like blanket. Shrubs and trees can be planted manually.

- **Shoreline Fringe** - Shoreline fridge vegetation should be planted in mid-May to early June after water levels have reached a stable level. The seed mixture should be protected due to water level fluctuations within this dynamic zone. A biodegradable mesh-like blanket is highly recommended to establish ground cover. Shrubs and trees can be planted through openings created in the mesh blanket.
- **Aquatic Fringe/Shallow Water** – Establishing plants within this zone will require great care in material handling and growth monitoring. Maintenance will be needed both within the short and long-term. Emergent vegetation can easily be planted by hand if the substrate is suitable (ideally a firm substrate with at least 10% organics by volume). Young shoots are preferable because they have established root structures which are important for early stability. Planting should occur from late May to early June. Planting mature plants will be important to establish submerged rooted plants. Mature plants should be planted in late spring to early summer when water is warmer and sunlight penetration is higher. Alternatively, vegetative propagules may be planted in early spring or fall to germinate over the spring or winter and begin growing in the following growing season.

Aquatic Environment Maintenance

It is important to regularly monitor BMPs that have a permanent pool of water to ensure conditions promoting a healthy aquatic environment are maintained. Excessive algae growth is a common problem and is an indicator of excess nutrients. This problem may be addressed by encouraging growth of more desirable aquatic and semi-aquatic vegetation in and around the permanent pool. Plants selected should be tolerant of fluctuations in the water level and must have a high capacity to take up the specific nutrients associated with the problem. If algae proliferation is not addressed, rain events may wash the algae downstream and put stress on downstream aquatic habitats.

Insect Control

Ponded water can serve as a breeding site for mosquitos and other insects. Preventing permanent impoundments from developing stagnant areas is the most effective way to control insects. A BMP with a permanent pool should incorporate a source of steady dry-weather flow. Removing floating debris from drainage paths helps prevent water from collecting and stagnating in areas. In larger basins, it may be beneficial to stock the pond with fish that feed on mosquito larvae. Splash aerators can also be used however they will require electricity at the site, increase maintenance costs and must be designed to not alter the settling efficiency of the BMP.

Maintenance of Mechanical Components

BMPs may have mechanical components that need periodic attention. Routine inspection and preventative maintenance of these components should be included on a routine inspection/maintenance checklist.

Winter Operation

Freezing or saturation of soils can reduce capacity in infiltration facilities, surface filters, and bioretention areas. Subsurface filters may be less susceptible than surface filter however they often

demonstrate poorer performance in winter due to freezing in underdrain pipes or the filter medium. Filters composed of organic media are especially prone to freezing because they retain water.

Infiltration facilities and filters have an increased likelihood of clogging during winter months due to higher sediment loads from sanding and salting roads. There is also an increased risk of groundwater contamination from road salt for infiltration facilities that receive road runoff. If filters and infiltration systems are part of a treatment train, runoff may be diverted in the winter to by-pass these BMPs as long as the runoff will still pass through some type of downstream controls.

Emergency Maintenance

Maintenance after floods or other storm events require immediate attention. In such cases, replanting vegetation and repairing damaged structures may be necessary. After a flood, standing water may pose health risks from contact pollutants or mosquitos. Such areas may need to be blocked and mosquito control should be considered.

Any obstructions or debris deposited from storm events should be removed immediately from all BMPs. In some cases, woody debris may be repositioned rather than removed if it will provide habitat benefits. Sinkholes or evidence of subsidence within a BMP footprint or its drainage pathway indicate BMP failure. The practice will need to be repaired using appropriate engineering techniques.

Maintenance of Other Features

All other devices and features associated with BMPs should be monitored and maintained. The condition of these features should be noted and repaired if necessary during periodic inspections of the BMP. Some of these elements affect the safety or aesthetics of the facility and may include things such as:

- Fences
- Access roads
- Lighting
- Signage
- Watering systems
- Trails
- Nest boxes
- Platforms

BMP Maintenance Schedule and Guidelines

The following sections detail the recommended BMP maintenance schedule and guidelines for each of the non-proprietary BMPs.

Bioretention Area Maintenance Schedule and Guidelines

<u>First Year Maintenance Guidelines</u>

Successful establishment of bioretention areas require that the following tasks be performed during the first year following installation:

- *Initial inspections.* For the first six (6) months following construction, the bioretention area should be inspected at least twice after storm events exceeding one half (½) inch of rainfall.

- *Spot reseeding.* Inspect for bare or eroding areas in the contributing drainage area or around the BMP area. Ensure any bare or eroded areas are immediately stabilized with grass cover.
- *Watering.* Watering needs to be done once a week during the first two (2) months. Beyond that, water as needed during the first growing season (April-October).
- Remove and replace dead plants.

Routine Maintenance Guidelines

Bioretention areas must be inspected to ensure that they are functioning properly and in accordance with the approved design and specifications. Repairs need to be addressed immediately.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect and remove any excess sediment	Annually
Mow grass filter strips and bioretention turf cover	At least four times per year
Weed and rake mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Remove sediment in pretreatment cells and inflows	Every 2-3 years
Replace the mulch layer	Every 3 years

Constructed Wetlands Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of constructed wetland areas will require the following tasks be undertaken during the first year:

- *Initial inspections*. During the first six (6) months following construction, the site should be inspected at least twice after storm events exceeding one half (½) inch of rainfall.
- *Spot reseeding.* Inspect the contributing area around the wetland buffer for bare or eroding areas. Make sure any observed bare or eroding areas are immediately stabilized with grass cover.
- *Watering.* Trees planted in and around the wetland need watering during the first growing season. Consider watering every three (3) days for the first month and then weekly during the first growing season (April-October), depending on rainfall.
- *Reinforcement Plantings.* Remove and replace any dead or dying plantings.

Routine Maintenance Guidelines

Constructed wetlands must be inspected to ensure they are functioning properly and in accordance with the approved design and specifications. Any observed items in need of repair must be addressed immediately.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check/repair eroded areas	Annually
Check for and remove nuisance animals/burrows	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Forebay inspection/cleanout	Remove sediment when forebay reaches 50% capacity or every 5 years
Inspect orifice/repair any clogging	Annually
Inspect/exercise all mechanical devices	Annually
Inspect/repair any structural damage and leaks	Annually
Inspect inlets/outlets and repair and clogging or damage	Annually
Remove woody vegetation on/near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge when necessary
Harvest overgrown vegetation to guide wetland maturation	As needed
Replace displaced rip rap	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Dry Swale Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Swales must be inspected to ensure they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be addressed immediately.

Routine Maintenance Tasks	Frequency
Remove trash/debris	As needed
Check/repair eroded areas	Annually
Remove any invasive vegetation/weeds	As needed
Mow grass to a height of 4-9 inches	As needed to maintain correct height
Inspect plant composition for consistency with approved plans and correct deficiencies	Annually
Replace any dead/dying plants	Annually
Remove accumulated sand/sediment	Annually

Inspect check dams and repair any erosion or blockage	Annually
Inspect underdrains and repair any clogging or damage	Annually
Inspect inflow/outlets and repair any clogging or damage	Annually

Dry Detention Basin Maintenance

First Year Maintenance Guidelines

Successful establishments of dry detention basins require that the following tasks be undertaken in the first year following installation:

- Immediately after the dry extended detention basin is established, the vegetation will be watered twice weekly if needed until the plants become established (around six weeks).
- No portion of the dry extended detention pond will be fertilized after the first initial fertilization to establish vegetation.
- The vegetation in and around the basin will be maintained at a height of approximately six inches.

Routine Maintenance Guidelines

Dry detention basins must be inspected to ensure that they are functioning in good working condition and in accordance with the approved design and specifications. Items in need of repair must be addressed immediately.

Routine Maintenance Tasks	Frequency
Remove debris and trash	As needed
Outlet/inlet inspection and cleanout	Annually
Bank mowing and inspection/stabilization of eroded areas	As needed to maintain 4-9 inch height
Forebay inspection and cleanout	Annually (Remove sediment every 7 years or when sediment volume exceeds 50% of storage volume)
Check pond depth	Annually remove sediment as needed
Remove woody vegetation along embankment	Annually
Inspect for and repair structural damage	Annually
Inspect, exercise, and repair all mechanical devices	Annually
Repair broken pipes	As needed
Replace riprap that has been choked with sediment	As needed

Extended Detention (ED) Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

ED ponds are prone to clogging at the ED low-flow orifice. Ideally, the orifice should be inspected at least twice a year after initial construction.

Routine Maintenance Guidelines

ED ponds must be inspected to ensure that they are functioning in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Check for and remove nuisance animals/burrows	Annually
Mow area around facility	Twice per year at a minimum
Forebay inspection and cleanout	Annually (remove sediment when 50% capacity reached or every 7 years)
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect orifice and repair any clogging/damage	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair any structural damage/leaks	Annually
Inspect inlets/outlets and repair any clogging or damage	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Grass Channel Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Grass channels must be inspected to ensure that they are operating in functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass to height of 4-9 inches	As needed to maintain correct height
Remove excess sediment accumulation	Annually

Inspect for and repair any clogging	Annually
Inspect check dams and repair any erosion or blockages	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead/damaged plant material	As needed

Infiltration Practice Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Infiltration practices must be inspected to ensure that they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check for and repair eroded areas	Annually
Check for and remove nuisance animals	Annually
Mow grass to height of 4-9 inches	As needed to maintain correct height
Inspect/remove excess sediment	Quarterly
Inspect facility for clogging/repair	Semi-annually
Remove woody vegetation from facility	Semi-annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect/repair any structural damage	Annually
Inspect/repair any clogged outlets or inlets	Annually
Replace clogged pea gravel, topsoil, and filter fabric	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Permeable Pavement Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Permeable pavement must be inspected to ensure that it is functioning in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Inspect facility for clogging and repair any clogging and improper drainage	Annually

Inspect/repair any structural damage	Annually
Inspect/repair any clogged or damaged inlets/outlets	Annually

Rainwater Harvesting Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rainwater harvesting systems must be inspected to ensure they are functioning appropriately and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Rainwater harvesting system components should be inspected semi-annually by the owner. A comprehensive inspection by a qualified third party inspector should occur every third year.

Routine Maintenance Tasks	Frequency
Remove leaves and debris from gutters and downspouts	Semi-annually
Remove any algae growth	Semi-annually
Inspect and clean prescreening devices and first flush diverters	Quarterly
Inspect and clean storage tank lids	Annually
Inspect for and repair any clogging	Annually
Inspect and repair mosquito screens	Annually
Inspect tank and remove sediment build up	Every 3 years
Clear overhanging vegetation and trees over roof	Every 3 years
Check integrity of backflow preventer	Every 3 years
Inspect structural integrity of tank, pump, pipe, and electrical system/repair and damage	Every 3 years
Replace damaged/defective components	As needed

Rooftop Disconnection BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Rooftop disconnections must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for downspout disconnection	Annually
Inspect for and remove any sediment accumulation	Annually
Check that pervious areas receiving flow have not been disturbed or converted	Annually

Sheet Flow to Vegetated Filter Areas and Conserved Open Space Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

These practices must be inspected to ensure that they operate in good working condition and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Mow grass filter strips to prevent woody growth	Semi-annually
Inspect/remove sediment accumulation	Annually
Inspect level spreader for diffuse flow/repair any	Annually
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed

Soil Compost Amendment Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

In order to ensure the success of soil compost amendments, the following tasks must be

undertaken in the first year following soil restoration:

- Initial inspections. For the first six months following the incorporation of soil amendments, the
- site should be inspected at least once after each storm event that exceeds 1/2-inch of rainfall.
- Spot Reseeding. Check for bare or eroding areas in the contributing drainage area or around the
- soil restoration area and make sure they are immediately stabilized with grass cover.
- Fertilization. Depending on the amended soils test, a one-time, spot fertilization may be needed
- in the fall after the first growing season to increase plant vigor.
- Watering. Water once every three days for the first month, and then weekly during the first year
- (April-October), depending on rainfall.

Routine Maintenance Guidelines

Soil compost amendments must be maintained in good working condition and in accordance

with the approved design and specifications. There are no major on-going maintenance needs

associated with compost amendments.

Urban Bioretention Area Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of bioretention areas requires that the following tasks be undertaken in the first year following installation:

- *Initial inspections*. For the first six (6) months following construction, the bioretention area should be inspected at least twice after storm events that exceed one-half (1/2) inch of rainfall.
- *Spot reseeding.* Inspect for bare or eroding areas in the contributing drainage area or around the bioretention area, and make sure they are immediately stabilized with grass cover.
- *Watering.* Watering is needed once a week during the first two (2) months, and then as needed during the first growing season (April-October), depending on rainfall.
- Remove and replace dead plants.

Routine Maintenance Guidelines:

Bioretention area must be inspected to ensure that they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Inspect for and remove excess sediment	Annually
Weed mulch	Twice during the growing season
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Remulch to maintain a three-inch layer	Annually
Prune trees and shrubs	Annually
Inspect for clogging or ponding water in the filter bed	Annually
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed
Replace the mulch layer	Every 3 years

Vegetated Roof Maintenance Schedule and Guidelines

First Year Maintenance Guidelines

Successful establishment of vegetated roofs require that the following tasks be undertaken during the first year following construction:

- Initial inspections. The roof should be inspected monthly during the vegetation establishment period, and then every six months thereafter to assess the state of vegetative cover and to look for leaks, drainage problems and other functional or structural concerns.

Routine Maintenance Guidelines:

Vegetated roofs must be inspected to ensure they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

The use of herbicides, insecticides, and fertilizers need to be avoided since their use could degrade the waterproof membrane of the vegetated roof. Power-washing and other exterior maintenance operations should be avoided so that cleaning agents and other chemicals do not harm the plants.

Routine Maintenance Tasks	Frequency
Remove trash and debris	Semi-annually
Inspect waterproof membrane for leaks or cracks and repair any damage	Semi-annually
Remove invasive plants	Semi-annually
Inspect and remove overgrowth and debris from roof drains, scuppers and gutters	Semi-annually
Inspect plant composition for consistency with approved plans and correct	Semi-annually
Replace any dead or dying plants	Semi-annually
Remove excess debris, fallen leaves, and overgrowth	Semi-annually
Check and repair areas of erosion	Semi-annually
Water to promote plant growth and survival	As needed

Wet Pond Maintenance Schedule and Guidelines

First Year Maintenance Guidelines:

Successful establishment of wet ponds requires that the following tasks be undertaken during the first year following construction:

- *Initial inspections*. For the first six (6) months following construction, the site should be inspected at least twice after storm events that exceed one-half (1/2) inch of rainfall.
- *Aquatic Benches*. Remove and replace dead or dying plants.
- *Spot reseeding*. Inspect for eroding areas in the contributing drainage area or around the pond buffer, and make sure they are immediately stabilized with grass cover.
- *Watering.* Trees planted in the pond buffer need to be watered during the first growing season. In general, consider watering every three (3) days for the first month, and then weekly during the remainder of the first growing season (April-October), depending on rainfall.

Routine Maintenance Guidelines:

Wet ponds must be inspected to ensure that they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	Frequency
Remove trash and debris	As needed
Check/repair eroded areas	Annually
Check for and remove nuisance animals and burrows	Annually
Mow area around facility	Twice per year minimum

Forebay inspection and cleanout	Annually (remove sediment when forebay reaches 50% capacity or every 7 years)
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Inspect/repair any clogging or damage to the orifice	Annually
Inspect and exercise all mechanical devices	Annually
Inspect for and repair structural damage and leaks	Annually
Inspect and repair any damaged or clogged inlets and outlets	Annually
Remove woody vegetation on or near embankments, forebays, spillways, and outlets	Annually
Check sediment accumulation in the permanent pool	Annually, dredge if necessary
Replace displaced rip rap	As needed
Remove invasive plants	As needed
Replace dead or damaged plant material	As needed
Repair broken pipes	As needed

Wet Swale Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Swales must be inspected to ensure that they are functioning properly and in accordance with the approved design and specifications. Items in need of repair must be immediately addressed.

Routine Maintenance Tasks	**Frequency**
Remove trash and debris	As needed
Check and repair eroded areas	Annually
Remove any invasive vegetation	As needed
Inspect plant composition for consistency with approved plans and correct any deficiencies	Annually
Replace any dead or dying plantings	Annually
Remove accumulated sand or sediment	Annually
Inspect/repair any eroded or blocked check dams	Annually
Inspect/remove any clogging at inflow and outlets	Annually

Proprietary BMP Maintenance Schedule and Guidelines

Routine Maintenance Guidelines

Proprietary systems must be maintained in good working condition and in accordance with the approved design and specifications. All proprietary systems should be inspected and maintained

according to the manufacturer's recommendations. See Appendix F for relevant proprietary BMP maintenance guidelines.

4. Town-Owned Stormwater BMP Inventory[1]

[1] To be included as update to Town's BMP database is finalized.

5. Town-Owned Stormwater BMP Inspection Procedures

The following sections detail the procedures that should be followed before, during, and after each inspection of a Town-owned stormwater BMP.

Pre-Inspection Procedure

1. Print an inspection report according to the type of BMP you intend to inspect.
2. Print the previous inspection report found on in the specific facility's folder in Z:\MS4 Program \Post-Construction Stormwater Management\Town-Owned Facilities. The previous inspection report will be used to determine reoccurring issues with the facility.
3. Note the rainfall data on the inspection report. Consult weather.gov:
    a. On the weather.gov homepage, type in Dumfries, VA.
    b. Click "Get more detailed information" under the weather graphic on the left.
    c. On the far right side, click on "3 Day History" to determine rainfall data.
    d. Precipitation (in.) is on the far right side of the table. Record the sum of the rainfall in the last 3 days.

Inspection Procedure

1. Take overall photos of the facility.
2. Inspect the facility according to the guidelines provided in the inspection report. Check the previous inspection report to ensure that any identified issues have been resolved.
3. Take sufficient notes to complete all report sections.
4. Take photos of all areas that will require maintenance, areas that may need to be monitored, and areas that you have follow-up questions on.
5. Document maintenance actions that will need to be taken.

Post-Inspection Procedure

1. Create a new folder to upload the photos from the inspection. This folder should be located in the specified facility's folder within Z:\MS4 Program \Post-Construction Stormwater Management\Town-Owned Facilities.
2. Label the new folder with the inspection date (Ex. BMP Inspection_4-2-2016).
3. Upload the inspection report and all photos.

6. Private Stormwater BMP Maintenance and Inspections

All privately-owned stormwater BMPs not serving single-family residential properties will be inspected by the Town at least once every five (5) years.

Town inspections will be performed in accordance with the following procedures:

1. Prior to inspection, a pre-inspection notification letter will be mailed to the property owner/contact on file for each BMP. The template for the pre-inspection notification letter is in Appendix C.
2. Inspections will be documented on the inspection forms in Appendix B.
3. After the inspection has been completed, documentation of the inspection, including pictures will be saved to the specific facility's folder within Z: \MS4 Program\Post-Construction Stormwater Management\Privately-Owned Facilities\
4. Hard copies of all inspections will be kept on file for each BMP.
5. After the inspection has been completed, a post inspection letter will be sent to the property owner and/or contact on file for each BMP with the results of the inspection. If required, the letter will state any maintenance items needed to bring the BMP into compliance with its maintenance agreement. Templates for post-inspection notification letters can be found in Appendix D.
6. All enforcement action notification will follow the procedures outlined at Town Code Section 26-165.13. Templates for enforcement action letters can be found in appendix E of this document.

Documentation Requirements:

All inspection forms, pre- and post-inspection letters, and enforcement letters will be documented in the folder for the specific facility within Z: \MS4 Program\Post-Construction Stormwater Management\Privately-Owned Facilities\. Additionally, a hard copy of all inspections and letters will be kept on file for a minimum of 5 years.

Appendices[2]:

[2] Please see original document for appendices.

Appendix D – Pollution Prevention/Good Housekeeping for Municipal Facilities (MCM #6)

Stormwater Management Standard Operating Procedures Handbook

A component of the

Virginia Municipal

Separate Storm Sewer System Management Program

Town of Dumfries, Virginia

Public Works Department

17755 Main Street

Dumfries, VA 22026

Contents

1.0 Introduction

The Town of Dumfries is an operator of a Small Municipal Separate Storm Sewer System (MS4). A municipal separate storm sewer is defined as "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, 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 agency under § 208 of the Clean Water Act 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 a part of a publicly owned treatment works"

The US Census in 2010 determined the Town's population to be 4,961, that the Town is within an Urbanized Area, and thus subject to the General Permit for Discharges of Stormwater from Small Municipal 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 permit establishes six "minimum control measures" (MCMs) to prevent stormwater pollution in the MS4:

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

The Town's MS4 Program Plan (which is updated annually) outlines specific actions, known as best management practices (BMPs), that the Town will use to address the six MCMs. Among the requirements of the General Permit, the Town must develop and implement written procedures to prevent harmful pollutants from entering into the MS4. This document serves as a compilation of written procedures to serve as the Standard Operating Procedures for Town employees in compliance with General Permit Requirements.

2.0 Standard Operating Procedures for Daily Operations

The Virginia General Permit for Discharges of Stormwater from Small MS4s (General Permit), published at 9 VAC-25-890-40 et al, has specific requirements for pollution prevention and good housekeeping for municipal operations. Under the General Permit, municipalities are required to re-evaluate how they manage municipal infrastructure and develop procedures to protect stormwater and ultimately the waterbodies the stormwater discharges to from pollution. Specifically, as noted in Section II.B. 6.a, the developed SOPs will comply with the following requirements:

- Prevent illicit discharges;
- Ensure the proper disposal of waste materials, including landscape wastes;
- Prevent the discharge of municipal vehicle wash water into the MS4 without authorization under a separate VPDES permit;
- Require implementation of best management practices when discharging water pumped from utility construction and maintenance activities;

- Minimize the pollutants in stormwater runoff from bulk storage areas (e.g., salt storage, topsoil stockpiles) through the use of best management practices;
- Prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment; and
- Ensure that the application of materials, including fertilizers and pesticides, is conducted in accordance with the manufacturer's recommendations

To address these requirements, SOPs for daily operations are broken up into four subsections which describe the major categories of operations completed by the Town:

- Equipment maintenance and washing
- Street and parking lot maintenance
- Pesticide, herbicide, and fertilizer application, storage, and transport
- Snow and ice removal

2.1 Standard Operating Procedure for Equipment Maintenance and Washing

To protect water quality, non-stormwater discharges to the MS4 must be reduced or eliminated. This standard operating procedure (SOP) is to be followed for equipment maintenance, repair, and washing activities. This SOP is prepared with the intention of preventing the discharge of pollutants associated with these activities before they can enter the MS4 and thus to limit the potential for pollutants to impact waterways.

Responsible Parties*:* Department of Public Works

2.1.1 Equipment Maintenance:

Standard operating procedures for equipment maintenance are important to prevent the release of pollutants such as oil, grease, antifreeze, solvents, battery acid, detergents, and heavy metals to the MS4. The procedures outlined below are intended to target specific vehicle/equipment repair and maintenance activities that have the potential to negatively impact water quality.

<u>Procedures and Practices:</u>

- To the extent possible, all maintenance activities should be conducted indoors or under cover to prevent discharge of pollutants into the environment.
- A designated area should be established for equipment that is awaiting maintenance.
    - The designated area must be located away from storm drain inlets or other stormwater conveyances.
    - Drip pans or other secondary containment should be placed under leaking or leak prone equipment.
    - Visual inspections of the designated area should be conducted to identify any environmental threats to surface waters.
- Fluids such as motor oil, grease, anti-freeze, solvents, and similar materials should be properly stored when not in use.
    - All fluids should be stored within a secondary containment structure, such as a concrete secondary structure, spill pad, or other similar structure.
    - All fluids should be properly covered and contained in labelled containers.
    - Avoid storing hazardous materials in high traffic areas.
- Spill and leaks should be cleaned immediately.

  - Use dry cleanup methods to clean up spilled material such as absorbent pads, granular absorbent, and similar measures.
  - Dispose of waste sorbent material properly.
  - Do not use water to clean up spilled material.
- Only wash parts in a designated area and verify that no wash water is discharged in the process.
  - Whenever possible, clean parts without solvents.
- The maintenance area should be swept as needed to prevent the buildup of pollutants.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace any damaged equipment immediately.
- Drain oil filters before disposal or recycling
- A trash receptacle must be in/near the maintenance area.

Employee Training:

Employee training must include: preventative maintenance and good housekeeping practices, proper fueling procedures; material handling including and spill prevention and response. The General Permit requires biennial training for all good housekeeping practices.

2.1.2 Equipment Washing

Equipment washing is a necessary component of maintenance however improper care while cleaning equipment can result in the discharge of contaminants into the MS4. The procedures outlined below are written with the intent to minimize the impact of equipment washing on water quality within the MS4:

Procedures and Practices:

- Sweep, vacuum or mop floors, sidewalks, and pavement rather than hosing them down.
- Perform vehicle/equipment washing in a designated covered facility, preferably indoors if possible. Always wash away from storm drains and drinking water wells.
- Obtain and use drain guards to catch sediments, grease, and other contaminants that might enter into storm drains from vehicle washing
- Do not let wastewater enter into storm drains.
- Inspect and maintain washing equipment, especially the hoses, wands, and nozzles. Shut off when not in use.

Employee Training:

Employee training must include: preventive maintenance and good housekeeping practices, proper fueling procedures; material handling including spill prevention and response. The General Permit requires biennial training for all good housekeeping practices.

2.2 Standard Operating Procedure for Street and Parking Lot Maintenance

The following SOP is to be followed by all Town staff and any contractors for street and parking lot maintenance. This SOP is prepared with the intention of preventing the discharge of pollutants associated with these activities before they can enter the MS4 and thus to limit the potential for pollutants to impact waterways.

Responsible Parties*:* Department of Public Works

Practices and Procedures:

- Sweep all town streets regularly.

  - Make sure street sweeping brushes, water spray hoses, and equipment are functional before leaving the shop. Keep vehicles properly maintained.
  - Operate all sweepers according to manufacturer's recommended procedures to get optimal debris removal.
  - Never sweep into the storm drain system.
  - Never store street sweepings near storm drains.
  - Sweep after special events such as fairs and festivals where additional debris may have accumulated.
- Remove litter from public right-of-way and other public properties.
- Paving activities should be performed using concrete, asphalt, or other sealers only under dry weather conditions to prevent the contaminated runoff.

Employee Training:

Employee training should include proper street sweeping techniques and waste disposal. Employee training will occur at a minimum of biennially as required by the General Permit.

2.3 Standard Operating Procedure for Pesticide, Herbicide, and Fertilizer Application, Storage, and Transport

The following SOP is to be followed for pesticide, herbicide, and fertilizer application, storage, and transport. These materials, if not properly applied, stored, and transported, have the potential to enter the MS4 and degrade waterways. This SOP was prepared with the intention of preventing the discharge of these pollutants to the MS4.

Responsible Parties: Department of Public Works

Practices and Procedures:

- As established by the memorandum distributed on October 13, 2015 (Appendix A), no Town employee will apply pesticides or herbicides unless they obtain the proper certification.
- All pesticide and herbicide application will be made by a commercial company with properly certified personnel.
- Store pesticides, herbicides, and fertilizers in a covered container off the floor in a dry location. Never store near storm drains or waterbodies
- Inspect storage area for leaks and spills.
- Check expiration dates and dispose of any expired product in accordance with the manufacturer's specifications.
- Keep an up-to-date inventory of any stored pesticides, herbicides, and fertilizers stored.
- Immediately clean-up any spills or leakage. Use dry absorbent for liquids and sweep up solid product. Properly dispose of any waste.
- Use biodegradable products whenever possible.
- Turf and landscape nutrient management plans must be developed before fertilizers are applied at locations requiring such plans.

Employee Training:

Employee training must include: preventative maintenance and good housekeeping practices for material handling and storage including spill prevention and response. The General Permit requires biennial training for all good housekeeping practices.

2.4 Standard Operating Procedures for Snow and Ice Removal

The following SOP shall be followed for snow and ice removal during inclement weather. The Town of Dumfries requires any staff or contractors to use appropriate control measures during snow and ice removal to minimize discharges to the MS4 system.

Responsible Parties: Department of Public Works

Practices and Procedures:

- Before leaving the Public Works' Shop, check all vehicles to be used for leaks. Be sure to follow the equipment maintenance and washing procedures outlined in Section 2.1 of this handbook.
- The Town will use the lowest application rate of salt and sand to effectively treat surfaces to meet safety needs while minimizing negative impacts on water quality.
- Roads will be continuously plowed and sanded during a snow event to keep roads safe for motorists.
- After a snow event, crews will inspect roadways to determine necessary maintenance actions.
- Snow should not be piled on or near storm drains.
- Loading areas shall be swept frequently to prevent build-up of sediment
- When applying salt/sand, operator should take notice of proximity to surface waters to prevent materials from entering waterways during application.
- Storage of deicing materials:
    - Salt, sand, and other deicer materials must be stored away from storm drain inlets and other conveyance structures.
    - Salt and other chemical deicers will be stored in a covered structure or container at all times. Temporary stock piles must be covered with a tarp and secured at all times when not being used.
    - Salt and other chemical deicers will only be stored on an impervious surface such as a concrete slab.

Employee Training:

Employee training must include: preventative maintenance and good housekeeping practices, proper fueling procedures; material handling including spill prevention and response. The General Permit requires biennial training for all good housekeeping practices.

3.0 Standard Operating Procedures for Illicit Discharge Detection and Elimination (IDDE)

The General Permit requires the Town of Dumfries to develop and implement written procedures to detect, identify, and address unauthorized nonstormwater discharges, including illegal dumping to the MS4. The procedures outlined in the following subsections fulfill these requirements.

3.1 Written Dry Field Screening Methodologies:

The MS4 permit requires annual dry screening of outfalls from Dumfries' MS4. The Town has more than 50 known outfalls and thus is required to inspect a minimum of 50 outfalls each year. Dry screening inspections will be defined as inspections performed when precipitation is less than 0.5 inches within a 48-hour period. Inspections of outfalls are to be performed by trained Town staff. Annual reporting requirements and procedures for inspections are detailed below:

Annually report to DEQ:

- Number of outfalls inspected
- Screening results
- Detail of any follow-up actions necessitated by screening results

Pre-Inspection Instructions

It is important to conduct outfall screening inspections during dry weather. Dry weather screening is preferable because presence of dry weather flow may suggest that there is an illicit discharge or connection and further investigation will need to be conducted. Dry weather flow may not indicate a problem if it is originating from an allowable or conditionally allowed nonstormwater discharge (Town Code Sec. 26-185(b)). Prior to performing inspections, check to see if the area is experiencing dry weather conditions:

1. Go to http://weather.gov.
2. In the search box on the left hand side of the page, type in Dumfries, VA.
3. On the right hand side of the page, under More Information, click "3 Day History."
4. Note whether any precipitation was recorded for the past three days.
5. Note the time and quantity of last rain on the outfall inspection form.

Inspection Instructions:

1. Walking from downstream to upstream (in the stream so as not to disturb water or sediments which could alter assumptions of an outfall) inspect outfalls one at a time.
2. On the outfall inspection report form, note:
    a. Date and time of inspection
    b. Outfall number
    c. Name of staff performing inspection
    d. Site descriptions, see regulations
    e. Estimated discharge
    f. Visual observations: odor, color, clarity, floatables, deposits or stains, vegetation condition, structural condition, biology- good/bad designations for each
3. If the outfall has dry weather flow, take photos and collect a water sample.
4. Label each sample bottle with the appropriate outfall ID, data and time of collection, and sample collector initials.
5. Follow Table 1 for general information regarding sample holding times and methods.
6. An illicit discharge investigation will be conducted if any of the following apply:
    a. The overall outfall characterization is determined to be "suspect" or "obvious."
    b. On-site or lab water testing results in values exceeding the thresholds indicated in Table 2.

Table 1. Holding Times for Water Samples

Parameter	Holding Time	Holding Methods
Bacteria	6 hours	Cool, 4 ^{o}C
Ammonia	Process immediately	Can preserve with sulfuric acid & hold for 28 days
Fluoride	28 days (HDPE plastic container only)	Cool, 4^{o}C
Anionic Surfactants	2 days	Cool, 4^{o}

Potassium	6 months	Frozen
Total nitrogen/Total phosphorus	24 hours 30 days	Cool, 4°C Frozen below -20°C
pH	Process immediately	
Temperature	Process immediately	

Table 2. Dry weather outfall screening water quality indicators.

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater, or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

7. If an outfall is suspected to have an illicit discharge, document the outfall/illicit discharge and fill out the illicit discharge reporting form. Any suspected discharge shall be addressed according to the illicit discharge procedures. Additionally, the following procedures apply to suspected discharges at an outfall:
    a. The investigation should commence within 15 days of the initial identification of any observed continuous or intermittent potential illicit discharges.
    b. Potential illicit discharges from sewage or that are "significantly contaminated" shall be prioritized.
    c. The outfall should be visited three additional times during the permit cycle to determine if an intermittent discharge is present.
8. Outfall inspection data will be documented by the MS4 Coordinator and saved on the Public Works Drive (Public Works>Stormwater>MS4 Program> Illicit Discharge Detection and Elimination> Outfall Inspections).

3.2 Prioritization Schedule:

The Town estimates that the MS4 contains approximately 63 outfalls that discharge to Quantico Creek. Detailed mapping of the Town's MS4 showing locations of outfalls and interconnections with VDOT and Prince William County School's MS4s has been developed (Appendix C). Section II.B.3.c (1) (a) of the General Permit requires the Town to develop a prioritized field screening schedule of areas most likely to contain illicit discharges. Outfalls located along Canal Road will be prioritized because that is an industrialized area of the Town and is more likely to have illicit discharges. Those outfalls will be screened annually and include outfall AA, AB, 54, 44, AC, and 15. The Town's Outfall prioritization schedule will be modified as land use within the Town changes or as incidents occur that will require an area to be prioritized.

3.3 IDDE Investigation Procedures:

The Town of Dumfries has designated an Illicit Discharge Detection Inspection Team as a component of the IDDE Investigation Process. The Illicit Discharge Detection Inspection Team is composed of the MS4 Program Coordinator, Public Works Director, Public Works Assistant Director, and Field Support Team. For each investigation, a Lead Investigator will be appointed. The Lead Investigator may be any member of the inspection team, other town staff, or other agency such as the Virginia Department of

Environmental Quality (DEQ). The appropriate process for IDDE investigation and documentation is outlined below:

Investigation and Documentation Process:

1) Report of IDDE event received by town staff (report may have been received by phone, in person, email, etc.)

2) Staff forwards information to illicit discharge inspection team who will fill out illicit discharge reporting form (Appendix B). A lead investigator will be assigned.

   a) Rainfall data may be taken from online source.
   b) For form:
      i) Names: Name to match town staff email addresses.
      ii) Incident location.

3) During investigation, the illicit discharge team will update the Investigations folder (Public Works> Stormwater> MS4 Program > Illicit Discharge Detection and Elimination> Investigations) on the Town's Public Works drive with documentation, photos, letters, emails, etc. associated with the IDDE event.

   a) Within the Investigations folder, a new folder will be created for each investigation of an IDDE event.

   b) Files saved in the folder will be saved by [date investigation initiated year – month -day] [other additional title]. Examples:

      i) 2014-02-06 IDDE Report Form.pdf

      ii) 2014-02-06 Investigation Notes.docx

   c) A time frame upon which to conduct an investigation or investigations to identify and locate the source of any observed continuous or intermittent non-stormwater discharge to be prioritized as follows per MS4 permit: (i) illicit discharges suspected of being sanitary sewage or significantly contaminated must be discharged first, (ii) investigations of illicit discharges suspected of being less hazardous to human health and safety such as noncontact cooling water or wash water may be delayed until after all suspected sanitary or significantly contaminated discharges have been investigated, eliminated, or identified. Discharges authorized under a separate VPDES or state permit require no further action under this permit.

   d) If an illicit discharge is found, but within six months of the beginning of the investigation neither the source nor the same non-stormwater discharge has been identified, then this shall be documented.

   e) If the observed discharge is intermittent, then Lead Investigator must document that a minimum of three separate investigations were made in attempt to observe the discharge when it was flowing. If these attempts are unsuccessful, the operator must document.

f) The investigator will conduct on-site or lab water testing as necessary to determine the source of the illicit discharge (see section 3.4).

Table 1. Water Quality Indicators

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

g) The MS4 Coordinator will track suspected illicit discharges in a spreadsheet (Table 2) to ensure the appropriate follow-up steps are taken.

h) Follow the procedures outlined in Section 3.4 to determine the source of the illicit discharge.

i) Upon determination of the source, the Town will notify the apparent responsible party that a violation of the illicit discharge detection and elimination ordinance exists. If voluntary compliance cannot be achieved within an established timeframe, the program administrator may initiate formal enforcement action as specified in the IDDE ordinance.

j) After the illicit discharge has been removed from the subdrainage areas, that area must be re-inspected to verify all necessary corrections have been made.

   i) Dependent upon the extent of corrections, verification monitoring may be done at the initial junction manhole or closest downstream manhole.

   ii) Verification is accomplished using the same visual inspection procedures utilized during outfall inspections.

k) Investigators may use the Center for Watershed Protection's publication as guides, http://www.cwp.org/online-watershed-library/cat_view/64-manuals-and-plans/79-illicit-discharge-detection-and-elimination:

   i) Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments

   ii) Illicit Discharge Detection and Elimination: Technical Appendices

   iii) Illicit Discharge Detection and Tracking Guide

4) When IDDE event is "closed", the Lead Investigator will complete the illicit discharge inspector form.

5) IDDE Form will be forwarded to the MS4 Coordinator.

6) The illicit discharge inspection form will be included with the MS4 Annual Reports, as it will include required information: (i) date that 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.

3.4 Methodologies to Determine the Source of the Illicit Discharge

Source tracing begins when a suspected illicit discharge is identified through field assessments/testing or complaint call. When the source of the non-stormwater discharge is unknown, the following investigation techniques can be used to locate the source of an illicit discharge:

Storm Drain Network Investigations- systematic testing and inspection of junction manholes in continuous upstream or downstream manner. This investigation method will include the following steps:

1. Consult the drainage system map and identify major branches.
2. Starting from the outfall, observe and take probe readings at the next upstream manhole or junction to determine if there is any evidence of polluted discharge. Field crews should be looking for presence of flow during dry weather conditions, foul odors, colors or stained deposits, oily sheen, floatable materials, and/or unusual probe readings.
3. Repeat observations at each upstream manhole/junction until a junction is found without evidence of polluted discharge. The discharge source will likely be located between the junction without evidence of polluted discharge and the next downstream junction.
4. Work downstream from the "clean" manhole/junction to isolate the source of the polluted discharge entering the storm drain system.
5. If discharge is evident from a private property, follow the inspection procedures outlined in Section 26-186 of the IDDE Ordinance.
6. Document all findings and file according to the Investigation and Documentation Process outlined in section 3.2.

Drainage Area Investigations- An initial analysis is performed to determine potential generating sites by reviewing land uses followed by inspections or testing in areas where the illicit discharge appears to be specific to a certain type of land use or generating site.

1. Staff should make a list of likely discharge sources and consult drainage system maps to identify points of entry for pollutants.
2. Field crews should then conduct a survey of the drainage area to identify and confirm potential sources of the illicit discharge.
3. Town staff should conduct individual site inspections to locate the specific source of the discharge once potential discharge sites are identified.
4. Dye testing may be necessary to confirm a suspected activity is actually draining into the storm drain network. The use of dye tracers must be approved by the Department of Public Works in accordance with DEQ standards and regulations.

The method used will depend upon the type of information collected or reported, the drainage network, and any knowledge of operations/activities on the surrounding properties. The Illicit Discharge Report Form (Appendix B) will be used to document all source tracing investigations.

Water Quality Testing. All identified dry-weather discharges will be tested using commercially available water quality test meters or analyzed according to EPA-approved laboratory analysis methods. In addition to information required by for the IDDE form, all inspections shall be documented with photographs. If a flow is present, grab samples shall be taken and tested either in field or lab for the following indicator parameters:

- pH
- Conductivity
- Fluoride
- Surfactants

Field inspectors will be trained to conduct water quality sampling. Field instruments will be calibrated prior to use. All equipment shall be cleaned and serviced at the end of field investigations and according to manufacturer's standards.

Table 1 describes indicator parameter levels which may indicate the presence of an illicit discharge. Further lab testing for additional parameters, such as fecal coliform, may be required to confirm a suspected source. References such as the Center for Watershed Protection's Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments shall also be consulted to identify potential sources based upon field observations and initial results.

Table 3. Water Quality Parameter Thresholds

Screening Parameter	Potential Source	Threshold
Ammonia	Wastewater or Industrial	>0.2 mg/l
Fluoride	Tap Water	>0.25 mg/l
Detergents	Wastewater, Washwater or Industrial	>0.25 mg/l
Potassium	Wastewater or Industrial	>5-6 ppm

3.5 Follow-up Investigations

Once the source of an illicit discharge has been identified, the Town will notify the property owner or operator in writing about the problem. The written notification will include a deadline to correct the illicit discharge along with any of the requirements outlined in Section 26-190 of the IDDE Ordinance. A follow-up investigation will be conducted after the deadline set forth in the property owner's notification to verify compliance to correct the identified illicit discharge. As outlined in Section 26-190 of the IDDE Ordinance, if the operator fails to comply within the allotted time period, the Town Manager will designate a governmental agency or contractor to fix the problem at the violator's expense.

3.6 Continued Identification of Other Points of Discharge

To date, the Town has identified downstream interconnections with Prince William County and the Virginia Department of Transportation's MS4s. The Town will continue to identify other points of discharge if interconnections are clarified or the Town becomes aware of new interconnections in the future. If the Town becomes aware of an interconnection with a downstream MS4 that the Town had not previously notified regarding the interconnected systems, the Town will send a notice in writing to that MS4. The Town will continue to update its outfall map as unmapped outfalls are identified or other changes occur.

4.0 Inspection and Maintenance Procedures for Stormwater Facilities

4.1 Inspection Procedures

The quality of stormwater entering local, state, and federal waters depends on appropriate operation and maintenance of best management practices (BMPs). Stormwater management facilities must be regularly inspected to ensure that BMPs are functioning properly. It is important to inspect BMPs post-construction to ensure that they have been installed properly. The following procedures should be adhered to when performing post-construction inspections for BMPs:

1. Inspections will be performed by the Town's Public Works Department at the time of construction completion.
2. Using the approved plans, walk the site to determine if BMPs are installed properly.
3. Fill out the Stormwater Facility Inspection Form (Appendix D) and record any observed violations.
4. Discuss any observed violations that require corrective actions with the Director of Public Works.
5. Corrective measures will be completed within a reasonable timeframe as determined by the Director of Public Works. A written notice of violations with a deadline to comply will be sent to the project operator.
6. If compliance is not met within the designated timeframe, the enforcement procedures outlined in Section 26-165.13 of the Town Code.

Routine inspections also help to determine appropriate maintenance required for the facility. The procedures outlined below should be followed when inspecting stormwater facilities:

1. All stormwater facilities owned by the Town will be inspected on an annual basis to ensure they are operating properly and to determine any maintenance needs.
2. The Town will implement a schedule for inspecting all privately owned BMPs that discharge to the MS4 at least once every five years.
3. The Stormwater Facility Inspection Form (Appendix D), will be utilized during the inspection.
4. Review any on-site records such as site plans, stormwater management plans, spill prevention and response plans, etc.
5. Complete thorough walkthrough of the property. Inspector should look for:
    a. On-site BMPs
    b. Indicators or presence of illicit connections or discharges
    c. Evidence of past spills
    d. Material handling and storage areas (including loading and unloading areas)
    e. Equipment fueling and maintenance areas
    f. Storm drain structures and receiving streams

g. Ground disturbance and contamination

4.2 Maintenance Procedures

Maintenance is required to ensure that stormwater management facilities are operating as designed. Routine maintenance helps prevent more costly rehabilitative maintenance that can result when facilities have not been properly maintained. Stormwater facility operators are required to adhere to the following maintenance procedures:

1. Maintain records of any on-site maintenance including the date, description, and contractor (if applicable).
2. Private BMPs will be maintained in accordance with approved site plans and a completed Stormwater BMP Maintenance and Monitoring Agreement (Appendix E).

5.0 Procedures for Utilizing Legal Authorities

The General Permit requires the Town of Dumfries to establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its small MS4. This policy describes the Town's legal authority to control these pollutant discharges. The Town is required to have the authority to:

- Effectively prohibit nonstormwater discharges into the storm sewer
- Eliminate identified sources of illicit discharges
- Address discharges entering the MS4 from industrial or construction sites
- Require compliance with approved erosion and sediment control plan or agreements in lieu of a plan where an inspection finds that approved plans are not being properly implemented
- Require the use of Best Management Practices (BMPs) to prevent or reduce the discharge of pollutants into the MS4s in accordance with appropriate water quality and water quantity design criteria and any additional state or local design criteria
- Enforce maintenance responsibilities if maintenance is neglected by stormwater management facility owners
- Utilize enforcement mechanisms to require compliance with storm water ordinances, permits, contracts, or orders

5.1 Town of Dumfries Legal Authority

The Town of Dumfries adopted an ordinance for a Stormwater Management Program to establish procedures to enforce stormwater requirements related to water quality and quantity (Town Code Chapter 26, Article V, Division 3). The Town also adopted an Illicit Discharge Detection and Elimination (IDDE) Ordinance to prohibit illicit discharges into its MS4 which became effective on February 2nd, 2016 (Town Code Chapter 26, Article VII).

Other local authorities include controls for specific discharges to the storm drain system. These provisions include:

1. The Town's Solid Waste Ordinance regulates where solid waste and liquid waste, including hazardous waste may or may not be deposited. This Ordinance was enacted and codified as Sections 46-1 through 46-54 of the Town of Dumfries Municipal Code.
2. The Town's Comprehensive Plan, which provides policy guidance for Town land use decisions and outlines action strategies to meet water quality goals.
3. The Town's Erosion and Sediment Control Ordinance, which establishes requirements for the control of soil erosion, sediment deposition, and nonagricultural runoff and procedures to enforce them. This ordinance is codified as Section 26-99 through Section 26-129 of the Town of Dumfries Municipal Town Code.
4. Contract language in the Town's Terms and Conditions for municipal contractors.

5.2 Violations, Enforcement, and Penalties

If an individual is identified during an illicit discharge investigation to be responsible for intentionally contributing discharge or fails to take actions after receiving notice of a discharge, the following binding documents will be utilized to conduct any administrative action, enforcement, or penalties:

- IDDE Ordinance- Intentionally causing an illicit discharge is a violation of state and federal law under the Clean Water Act (CWA). The IDDE ordinance will dictate the appropriate enforcement action.
- Stormwater Management Program Ordinance- Unmanaged stormwater from land-disturbing activities is a violation of state and federal law under the CWA. The Stormwater Management Program ordinance will dictate the appropriate enforcement action.
- Town Pesticide/Herbicide Policy – In accordance with state law, pesticide and herbicide application must be done by properly certified individuals. Unless or until Town employees receive certification, pesticide and herbicide application will be performed by commercial companies with properly certified personnel. Violations of this policy will be administered by Town's disciplinary system.

Upon Town verification that the reported incident is a valid illicit discharge, the responsible party will be notified immediately (by letter) of the requirement to correct the illicit discharge. Penalties may be necessary in the following situations:

- Recurring illicit discharge incidents
- Failure of a person knowingly responsible for an illicit discharge to notify the Town; or
- Refusal by the responsible party to voluntarily take corrective action on an illicit discharge, once it is brought to their attention

6.0 Appendices

Appendix A: Herbicide and Pesticide Use Memorandum

DUMFRIES, VIRGINIA
Virginia's Oldest Continuously Chartered Town
CHARTERED 1749 INCORPORATED 1961

John Wilmer Porter Building
17755 Main Street
Dumfries, Virginia 22026-2386
Tel: 703-221-3400 / Fax: 703-221-3544
www.dumfriesva.gov

MEMORANDUM

October 13, 2015

TO: All Town Employees

FROM: Town Manager

REF: Herbicide and Pesticide Application

As required in Section II.B.6.a (iii) of the General MS4 Permit (9VAC25-890-40), the Town of Dumfries will "develop and implement written procedures designed to minimize or prevent pollution from the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers." This memorandum will serve as the written policy for herbicide and pesticide application by Town employees.

Section II.B.6.d(4) of the General Permit states the MS4 operator, " shall ensure that employees, and require that contractors, who apply pesticides and herbicides are properly trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia)." Additionally the Code of Virginia § 3.2-3929(A) states "No person shall use any pesticide classified for restricted use unless that person: (i) has first complied with the certification requirements of the Board; (ii) is under the direct supervision of a certified applicator on-site and training for certification as a commercial applicator or registered technician; or (iii) is producing an agricultural commodity while under the direct supervision of a private applicator on property owned or leased by that private applicator."

As an operator of a small MS4, the Town is required to ensure that employees and contractors who apply pesticides and herbicides are either certified to do so or supervised by a certified applicator while training for certification. Effective immediately, and until a Town employee obtains the proper certification, all pesticide or herbicide applications will be made by a commercial company with properly certified personnel.

cc: Public Works MS4 File

Appendix B: Illicit Discharge Detection and Elimination Report Form

Illicit Discharge Reporting Form

Incident ID:

Responder Information	
Report taken by:	Report Date:
Department:	Report Time:
Rainfall in past 24-48 hrs:	
Reporter Information	
Incident Time:	Incident Date:
Caller contact information:	
Name:	Phone:
Street Address:	Email:

Other Notes:

Incident Location	
Tax Map #:	Northern/ Easting:
Stream (HUC) Address:	Outfall # (if applicable):
Closest Street Address:	Nearby Landmark:

Primary Location Description	**Secondary Location Description**		
☐ Stream Corridor *(in or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☐ Upland Area *(land not adjacent to stream)*	☐ Near Storm Drain	☐ Near other water source (stormwater pond, wetland etc):	

Narrative description of location:

Upland Problem Indicator Description		
☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other(Describe in narrative section):	

Stream Corridor Problem Indicator Description			
Odor		**Appearance**	
☐ None	☐ Sewage	☐ "Normal"	☐ Oil Sheen
☐ Sulfide (rotten eggs, natural gas)	☐ Rancid/Sour	☐ Cloudy	☐ Suds
☐ Petroleum (gas)	☐ Other	☐ Other (Describe in narrative section):	

Floatables				
☐ None	☐ Sewage	☐ Algae	☐ Dead fish	☐ Other

Narrative description of problem indicators:

Suspected Violator (name, personal or vehicle description, license plate #, address, etc.):

Investigation Information		
Lead Investigator:	Department:	☐ Closed
Date Closed:		Closed by:

Summarize Resolution :

Follow-Up Investigations for Intermittent Discharges (If applicable. If within 6 months of finding illicit discharge neither source nor the same nonstormwater discharge has been identified, documentation is required. Document two additional attempts to observe the discharge when it was flowing below.		
Investigated By:	Department:	
Date of Investigation:		
Additional Observations:		
Investigated By:	Department:	
Date of Investigation:		
Additional Observations:		

Appendix C: Town of Dumfries Municipal Separate Storm Sewer System (MS4) Map

Appendix D: Stormwater Facility Inspection Form

Stormwater Facility Inspection Form

Inspection ID: _____

General Information

Inspector: _____ **Date:** _____ **Time:** _____ AM / PM

Project Name: _____ **Proj. ID:** _____

Site Address: _____ **APN:** _____

Type: ____Non-Storm ____Winterization ____Pre-Storm ____During Storm ____Post-Storm ____Complaint

Pre-announced: ___Yes ____No **Weather:** ____Sunny ____Cloudy ____Rain Rain Amount: _____inches

Site Rep: _____ **Company:** _____ **Phone:** _____

Pictures:

Best Management Practices (Site Review)

E = Effective, NM = Needs Maintenance, PI = Poor Installation, F = Failed/Not Appropriate,
NI = Not Implemented, 50 = <50% Implemented, 90 = <90% Implemented, NA = Not Applicable, NE = Not Evaluated

1. Run-on Management BMPs

a) Diversion of Run-On		b) Surface Roughening	

Comments:

2. Erosion Control BMPs

a) Temporary Slope Stabilization		Blanket	Seed	Mulch	BFM	Landscaped	
b) Temporary Flat Lot Stabilization		Blanket	Seed	Mulch	BFM	Landscaped	
c) Permanent Slope Stabilization		Blanket	Seed	Mulch	BFM	Landscaped	
d) Permanent Flat Lot Stabilization		Blanket	Seed	Mulch	BFM	Landscaped	

Comments:

3. Sediment Control BMPs

a) Silt Fence		e) Stabilized CST Entrance		h) Sediment Basin	
b) Fiber Roll		f) Check Dams		i) Dust Control	
c) Perimeter Control		g) Sediment Trap		j)Storm Water Inlet Protection	
d) Outlet Protection					

Comments:

4. Post Construction BMPs

a) Post CST Implemented		

Comments:

5. Material Management BMPs, and Non-Stormwater Management BMPs

a) Street Sweeping		e) Hazardous Materials Storage		i) Spill Kit On Site	
b) Waste Collection/Litter		f) Stockpile Management		j) Portable Toilet	
c) Concrete Wash-Out		g) Vehicle and Equipment Fueling		k) Dewatering Operations	
d) Material Storage		h) Vehicle and Equipment Maintenance			

Comments:

Stormwater Facility Inspection Form

Inspection ID: _____

6. Illicit Discharge: ____None____Potential____Observed **Turbidity (NTU):** Outfall _____

Comments: Upstream_____

Downstream _____

Corrective Actions Taken Since Last Inspection:

SWPPP Review/Recommendations:

SWPPP Onsite	Yes	No	Implementation Schedule	Yes	No	Inspection Documentation	Yes	No
Date Last Revised:			Sub-Contractors List	Yes	No	Training Documentation	Yes	No

Comments:

Violations Noted and Corrective Action Required:

Item	Code	Corrective Action Required

Signatory Requirements

____ I have received a copy of this Stormwater Inspection Checklist which confirms compliance with stormwater regulations on the date of the inspection.

____ I have received a copy of this Stormwater Inspection Checklist which constitutes an Order to Comply with the corrective actions described above. The corrective actions identified above will be considered and acted upon by_____.

Inspector **Property Owner or Representative**

_____ _____

Print **Print**

_____ _____

Signature **Date** **Signature** **Date**

Appendix E: Stormwater BMP Maintenance and Monitoring Agreement

Town of Dumfries
VIRGINIA

Department of Public Works
17755 Main Street, Dumfries, VA 22026
Phone: (703) 221-3400 Fax: (703) 221-3544

Town File NO._____ **Property Address: _____**

Stormwater BMP Maintenance and Monitoring Agreement

THIS AGREEMENT made and entered into this____day of_____, 20____, by and between_____, hereinafter called the "Landowner(s)," or "GRANTOR(S)," and the Town of Dumfries, Virginia, hereinafter called the "Town," or "GRANTEE";

WITNESSETH, that

WHEREAS, the Landowner(s) is/are the owner of certain real property, as described as tax map #_____, parcels # _____, block # _____ as recorded by deed in the land records of the Town of Dumfries, Virginia, in Deed Book_____ ,Page_____, hereinafter called the "Property"; and

WHEREAS, the Landowner(s) is/are proceeding to build on and develop the Property, and

WHEREAS, Grading Plan/Site Plan #_____, by_____, dated_____, hereinafter called the "Plan," which is expressly made a part hereof, as approved or to be approved by the Town, provides for detention of storm water and/or mitigation of polluted storm water run-off (BMP[1]) within the confines of the property; and

WHEREAS, the Town and the Landowner(s) agree that the health, safety, and welfare of the residents of the Town of Dumfries, Virginia, require that on-site storm water detention and/or BMP facilities, including but not limited to infiltration trenches, rain gardens, porous pavers, sand filters vortexes, and check dams, be constructed and maintained on the property; and

WHEREAS, the Town requires that on-site storm water detention and/or BMP facilities, as shown on the Plan, be constructed and adequately maintained by the Landowner(s);

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site storm water detention and/or BMP facilities shall be constructed by the Landowner(s) in accordance with the plans and specification identified in the Plan or issued by the manufacturer, as applicable.
2. The Landowner(s) shall maintain the storm water detention and/or BMP facilities as shown on the Plan in good working order per manufacturer's specification and acceptable to the Town.
3. The Landowner(s) hereby grants permission to the Town, its authorized agents and employees, to enter upon the Property and to inspect the storm water detention and/or BMP facilities whenever it deems necessary. Whenever possible, the Town shall notify the Landowner(s) prior to entering the Property.
4. The Landowner(s) will perform maintenance in accordance with the maintenance schedule for the stormwater management/BMP facilities including sediment removal as outlined on the approved plans.
5. In the event the Landowner(s) fails to maintain the storm water detention and/or BMP facilities, as shown on the Plan, in good working order per manufacturer's specification and acceptable to the Town, the Town may enter upon the Property and take whatever steps it deems necessary to maintain said storm water detention and BMP facilities. This provision shall not be construed to allow the Town to erect any structure of a permanent nature on the land of the Landowner(s). It is expressly understood and agreed that the Town is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Town.
6. In the event the Town, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, material, and the like, the Landowner(s) shall reimburse the Town upon demand, within ten (10) days of receipt thereof for all costs incurred by the Town hereunder.
7. It is the intent of this Agreement to insure the proper maintenance of on-site storm water detention and/or BMP facilities by the Landowner(s); provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by storm water drainage.

[1] BMP—Best Management Practice; refers to structural and non-structural practices that are employed to reduce the adverse impact of development on storm water run-off quality.

8. The Landowner(s), its executors, administrators, assigns, heirs, and any other successors in interest, shall indemnify and hold harmless the Town and its agents and employees for any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the Town from the construction, presence, existence or maintenance of the storm water detention and/or BMP facilities by the Landowner(s) or the Town.
9. In the event a claim is asserted against the Town, its agents or employees, the Town shall promptly notify the Landowner(s), and the Landowner(s) shall defend, at his/her own expense, and suit based on such claim. If any judgment or claims against the Town, its agents, or employees, shall be allowed, the Landowner(s) shall pay all costs and expenses in connection herewith.
10. This agreement shall be recorded among the land records of the Town of Dumfries, Virginia, and shall constitute a covenant running with the land, and shall be binding on the Landowner(s), its administrators, executors, assigns, heirs and any other successors in interest.
11. If any provision of this Agreement is found to be illegal, invalid, or unenforceable, that shall not affect the validity or enforceability of any other provision of this agreement.

WITNESS, the following signatures and seals

(GRANTOR #1)

_____ _____
(signature) (name of corporation, if applicable)

_____ _____
(print name) (state or place of incorporation, if applicable)

_____
(title, if applicable)

ATTEST:

State of _____

City/County (circle one, if applicable) of _____

To Wit:

Know all men by these presents, that_____has appeared and acknowledged the above signature in my presence on this_____day of_____, 20____.

My commission expires on _____ _____
Notary signature

(GRANTOR #2)

_____ _____
(signature) (name of corporation, if applicable)

_____ _____
(print name) (state or place of incorporation, if applicable)

_____
(title, if applicable)

ATTEST:

State of _____

City/County (circle one, if applicable) of _____ To Wit:

Know all men by these presents, that_____has appeared and acknowledged the above signature in my presence on this_____day of_____, 20____.

My commission expires on _____ _____
Notary signature

Town of Dumfries Stormwater Training Program

Under the MS4 permit, the Town of Dumfries is required to develop and implement a training program for applicable field personnel that addresses the following:

- Recognition and reporting of illicit discharges;
- Good housekeeping and pollution prevention employed during road, street, and parking lot maintenance; and
- Good housekeeping and pollution prevention practices that are to be employed in and around maintenance and public work facilities.

These training requirements are applicable to staff from the Public Works Department. Training events for each of the three topics listed above will occur at a least biennially each year. In addition to information related to the specific training topic, each training event will include an overview of the Town's stormwater management program, requirements, and local waterway impairments.

A standard operating procedures (SOP) handbook has been developed. This handbook is a compilation of procedures related to illicit discharge detection and elimination and good housekeeping/pollution prevention practices. The information presented in the handbook will be incorporated into the training program and will be distributed to all relevant staff. The handbook will continue to be updated as circumstances may change. The training coordinator will provide for an open discussion during the training events to address any questions or concerns and to allow for input in regards to good housekeeping/pollution prevention practices.

Additionally, the Town must ensure that the appropriate emergency response employees receive training in spill response. The Town will coordinate with the Police Department to ensure that those employees have received training in spill response.

The MS4 permit requires the Town to ensure that employees, and require that contractors, who apply pesticides and herbicides are properly trained or certified in accordance with the Virginia Pesticide Control Act (§3.2-3900 et seq. of the Code of Virginia). Town employees do not apply pesticides or herbicides and the Town ensures all contractors provide documentation of their certification.

The Town ensures that employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations. The Town will maintain copies of certifications from relevant staff and contractors. Although it is the employee's responsibility to maintain their certifications, the Town will track certification expiration dates and issue reminders regarding recertification.

Training Schedule and Tracking:

Sign-in sheets will be used to track attendance at each training. Each annual report will include a list of training events, the training date, the number of employees attending the training, and the training objective. The training coordinator will develop the training calendar for the reporting period no later than September 1st each year. The training coordinator will issue reminders to ensure all relevant staff attend the training. As needed, one makeup training event may be scheduled.

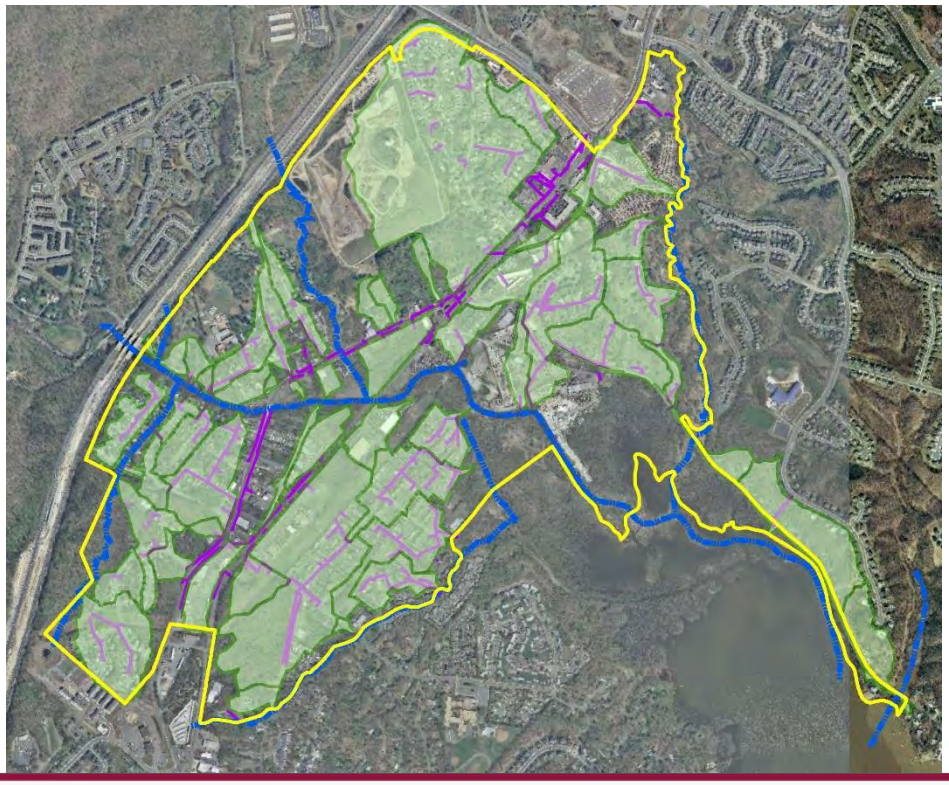
Department	Training Topic		
	Illicit Discharge Detection & Elimination	Pollution Prevention & Good Housekeeping[1]	Emergency Spill Response
Public Works Department	Biennial	Biennial	N/A
Police Department	N/A	N/A	On-going[2]

1. Pollution Prevention & Good Housekeeping training will be provided to the listed municipal departments. The training will include good housekeeping and pollution practices employed during road, street, and parking lot maintenance, in and around public works facilities, and in and around recreational facilities.
2. Emergency response employees with Hazmat certification will be responsible for ensuring their certifications are maintained.

Appendix E – Total Maximum Daily Load (TMDL) Action Plans

CHESAPEAKE BAY TMDL ACTION PLAN

MS4 Permit Cycle 2013 - 2018
Town of Dumfries



PREPARED FOR:

Town of Dumfries
17755 Main Street
Dumfries, Virginia 22026

April 4, 2015
Revised April 25, 2016

Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA Project Number: **B15147-01**

3RD PARTY REVIEW

This Report has been subjected to technical and quality reviews by:

Name: Clint Pendleton, EIT — Signature — 4/25/2016 Date
Project Engineer

Name: Carolyn A. Howard, PE — Signature — 4/25/2016 Date
Project Manager

Name: Lindsay B. Lally, PE — Signature — 4/25/2016 Date
Quality Reviewer

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APPENDICIES

1.0 INTRODUCTION

Since 2003, the Town of Dumfries (Town) has been subject to the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit). The Town's most recent permit (VAR040117) was issued by the Virginia Department of Environmental Quality (DEQ) effective July 1, 2013 and will expire June 30, 2018; this permit time period is hereinafter referred to as the first permit cycle.

In general, the MS4 permit regulates existing storm sewer systems to reduce the amount of stormwater pollution discharged into a waterbody. The permit also requires compliance for MS4 systems discharging to a waterbody with a Total Maximum Daily Load (TMDL) and an assigned Waste Load Allocation (WLA). The permit holder must prepare a TMDL Action Plan to reduce the applicable pollutants of concerns (POC) through the construction of structural stormwater best management practices (BMPs), non-structural operational measures, or a combination of the two.

Currently, there are two waterbodies with TMDLs and WLA reduction requirements for the Town – 1) the Chesapeake Bay TMDL and 2) an E. coli TMDL for Quantico Creek. The Chesapeake Bay TMDL was established by the U.S. Environmental Protection Agency in 2010; its POCs are nitrogen (N), phosphorus (P), and total suspended solids (TSS). The Town's total Chesapeake Bay WLAs and required POC reductions are based on the impervious and pervious (managed turf) acreage within the MS4 service area and the required reduction in loading rates for the Potomac River Basin; refer to Table 3b found in the Department of Environmental Quality's (DEQ) Chesapeake Bay TMDL Special Condition Guidance document dated 05/18/2015 (DEQ Guidance).

As required by the MS4 permit, this document is the Town's Chesapeake Bay TMDL Action Plan (Action Plan) documenting the first permit cycle required POC reductions and proposed compliance means and methods. A separate Action Plan is provided for the Quantico Creek TMDL.

Note: MS4 Permit regulation references are provided in [ ].

2.0 MS4 PERMIT AUTHORITY & IMPLEMENTATION PROGRAM

2.1 Current MS4 Implementation Review

[9VAC25-890-40 Section 1 C.2.a.(1)]

The Town adopted an MS4 Program Plan that documents compliance with the six minimum control measures (MCMs) identified in the MS4 Permit. The MS4 Program Plan is provided in Appendix A and can be found at the Town's website.

Additionally this Action Plan documents compliance with the Special Condition for the Chesapeake Bay TMDL requirements included in the MS4 permit.

2.2 Existing Legal Authority Review

[9VAC25-890-40 Section 1 C.2.a. (1)]

Based upon a review of the Town's ordinances, the Town has sufficient legal authority to meet the requirements of the MS4 Permit and execute the compliance objectives included in this Action Plan.

2.3 New or Modified Legal Authorities

[9VAC25-890-40 Section 1 C.2.a. (2)]

The Town does not anticipate any new or modified legal authorities to be implemented in the future to maintain compliance with the MS4 permit.

2.4 Means and Methods to Address New Sources of POCs

[9VAC25-890-40 Section 1 C.2.a. (3)]

The Town will address new discharges and sources of POCs into the Town's MS4 through its existing legal authorities and its Illicit Discharge Detection & Elimination Program.

2.5 Modifications to Action Plan

[9VAC25-890-40 Section 1 C.2.a. (9)]

Any modification to the Action Plan that occurs during the term of this MS4 Permit as part of its permit reapplication and not during the term of this state permit will be addressed at the time of permit reapplication.

3.0 PUBLIC COMMENT PROCESS AND PERIOD

[9VAC25-890-40 Section 1 C.2.a. (12)]

The Town's MS4 Permit requires a draft version of the Action Plan be made available to the public for review and comment. The plan was presented at the March 15, 2016 Town Council meeting. Town advertised a 30-day public comment period for April 5, 2016 through May 5, 2016 on the Town's TV channel, website, Facebook, and Twitter page. When the comment period ends, public comments will be compiled, reviewed, and addressed, as appropriate, in an updated draft of the Action Plan. A summary of the public comments will be provided in Appendix B.

4.0 MS4 PERMIT REQUIREMENTS

4.1 MS4 Service Area Delineation

[9VAC25-890-40 Section II B.3.a. (1)]

As required by the MS4 Permit, the Town's MS4 service area was delineated using 2013 VGIN Aerial Imagery, 2011 LiDAR topographic information and other GIS data provided by the Town of Dumfries and Prince William County. Additionally, storm sewer information included in the September 2004 USACE Report "Stream Restoration and Stormwater Management Study for Quantico Creek," and a working AutoCAD drawing provided by the Town in September 2015 was used to further define the MS4 areas. To mitigate inconsistencies and gaps in the available storm sewer information, Bing Streetside was utilized and a site visit was conducted to locate structures and determine existing drainage patterns, where possible. The Town's entire MS4 area is within the Quantico Creek and Chesapeake Bay watershed. Figure 1 below shows the Town's MS4 service area shaded in green.

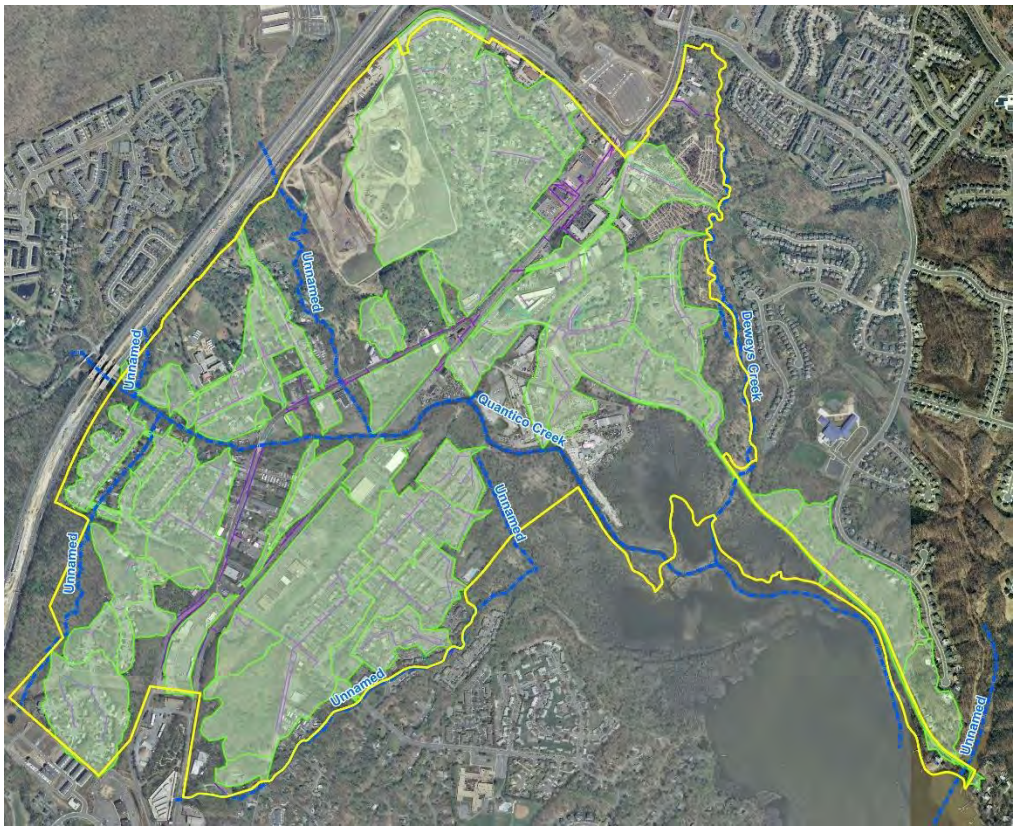


Figure 1: Town of Dumfries MS4 Service Area
Note: MS4 Service Area is shown in green. Corporate boundary is shown in yellow.

As per DEQ's Guidance, the following areas were excluded from the Town's MS4 service area:

1. Concentrated flows from properties owned and/or maintained by other MS4 permit holders—the Virginia Department of Transportation (VDOT) and Prince William County;
2. The VDOT maintained US Route 1 (Main Street and Fraley Boulevard); and
3. Privately owned areas within the Town that drain directly to streams and do not drain into or provide conveyance for the Town's MS4 system.

The Town may also exclude from its MS4 service area land regulated under any general VPDES permit that addresses industrial stormwater; however, these areas were not excluded in the initial mapping. Areas of sheet flow from other MS4 jurisdictions crossing into the Town's corporate limits were included in the Town's MS4 area, as per the DEQ Guidance.

As a result of the MS4 system delineation, Dewey's Creek, a tributary of Quantico Creek that runs north-south through the Town, does not have connections from the MS4 system, and, therefore, the creek and the adjacent privately-owned areas are outside the MS4 area.

GIS data and aerial imagery were used to determine the Town's regulated impervious and pervious acres. Impervious areas include buildings, roads, parking lots, sidewalks, recreational surfaces, and other similar features. Once the impervious areas were delineated, the features were clipped using the MS4 service area layer and resulting acreages were calculated.

Corporate Limits	986.9	Acres	
MS4 Service Area	575.6	Acres	
Impervious Area	182.3	Acres	32%
Pervious Area	345.4	Acres	60%
Forest Area	47.9	Acres	8%
MS4 Area of Total Corporate Limits	58.3%		

Table 2A: Town of Dumfries MS4 Service Area Summary

The extent of the MS4 service area and the land cover shown in this Action Plan are based on the latest GIS information dated 2013, not the July 1, 2009 condition. The Town reserves the right to make future adjustments to the MS4 service area and its land cover condition as more detailed and reliable information becomes available including but not limited to the following:

1. Removing areas of the MS4 service area that were created after June 30, 2009;
2. Adjusting the land cover condition in areas that were developed/redeveloped after June 30, 2009; and
3. Refining the MS4 service area as new data is made available to the Town.

4.2 Chesapeake Bay Action Plan Development

[9VAC25-890-40 Section I C.2.a]

The MS4 permit requires the Action Plan must show compliance with the following Special Conditions.

Special Condition 4	POC load estimate from existing sources (i.e. constructed prior to 7/1/2009)
Special Condition 5	1st permit cycle POC load reduction requirement from existing sources
Special Condition 6	Means and methods to meet POC load reduction requirements from existing sources
Special Condition 7	Means and methods to meet POC load reduction requirements from new sources (i.e. constructed between 7/1/2009 and 6/30/2014)
Special Condition 8	Means and methods to meet POC load reduction requirements from grandfathered projects constructed after 6/30/2014

The tables for the Potomac River basin included in the DEQ Guidance document were used in the development of this Action Plan.

5.0 POC REQUIRED OFFSETS FOR EXISTING & NEW SOURCES

5.1 Special Condition 4: POC Load Estimate from Existing Sources

[9VAC25-890-40 Section 1 C.2.a. (4)]

The POC Edge of Stream (EOS) loading rate for the Potomac River Basin is as provided in Table 2b in the DEQ Guidance. A summary of the Town's estimated POC load is provided in Table 5A below.

Pollutant	Subsource	Total Existing (Est.) Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate	Estimated Total POC Load Based on 2009 Progress Run
Nitrogen	Regulated Urban Impervious	182.3	16.86	3,073.58
	Regulated Urban Pervious	345.4	10.07	3,478.18
			Total:	***6,551.76***
Phosphorous	Regulated Urban Impervious	182.3	1.62	295.33
	Regulated Urban Pervious	345.4	0.41	141.61
			Total:	***436.94***
Total Suspended Solids	Regulated Urban Impervious	182.3	1171.32	213,531.64
	Regulated Urban Pervious	345.4	175.80	60,721.32
			Total:	***274,252.96***

Table 5A: Town of Dumfries Estimate of Existing Source Loads

5.2 Special Condition 5: 1st Permit Cycle POC Load Reduction Requirement From Existing Sources

[9VAC25-890-40 Section 1 C.2.a. (5)]

First permit cycle required reduction loading rate from existing sources is as provided in Table 3b in the DEQ Guidance. A summary of the Town's estimated POC reductions required for the first permit cycle is provided in Table 5B below.

Pollutant	Subsource	Total Existing (Est.) Acres Served by MS4 (06/30/09)	Est. Required Reduction in Loading Rate (lbs/acre/yr)	Total Est. Reduction Required (lbs/yr)
Nitrogen	Regulated Urban Impervious	182.3	0.07587	13.831
	Regulated Urban Pervious	345.4	0.03021	10.435
				24.266
Phosphorous	Regulated Urban Impervious	182.3	0.01296	2.363
	Regulated Urban Pervious	345.4	0.00149	0.513
			Total:	***2.876***
Total Suspended Solids	Regulated Urban Impervious	182.3	11.71320	2135.316
	Regulated Urban Pervious	345.4	0.76913	265.656
			Total:	***2400.972***

Table 5B: Total 1st Permit Cycle POC Estimated Reductions Required from Existing Sources

5.3 Special Condition 7: 1st Permit Cycle POC Load Reduction Requirement From New Sources

[9VAC25-890-40 Section 1 C.2.a. (7)]

This special condition applies to those permittees that have 1) adopted an average impervious land cover condition greater than 16% for the design of post-development stormwater management facilities under the Chesapeake Bay Preservation Act, or 2) allowed projects to be built with an impervious land cover condition greater than 16% for the design of post-development stormwater management (SWM) facilities through a "fee-in-lieu of" or similar program.

The Town does not utilize an average land cover condition greater than 16% in the design of post-development stormwater management facilities and does not have projects developed with a "fee-in-lieu of" or similar program; therefore, Special Condition 7 is not applicable.

5.4 Special Condition 8: 1st Permit Cycle POC Load Reduction Requirement From Grandfathered Projects

[9VAC25-890-40 Section 1 C.2.a. (8), (10)]

The Town is required to calculate new POC loads from grandfathered projects initiating construction after July 1, 2014, disturbing one acre or greater and with water quality requirements less stringent than 16% impervious cover. Unlike POCs from sources in Special Condition 7, loads from grandfathered projects must be 100% offset prior to the completion of the project. The Town does not utilize an average land cover condition greater than 16% in the design of post-development stormwater management facilities; therefore, Special Condition 8 is not applicable.

The Town is aware of one (1) grandfathered project located at 17733 Main Street (GPIN 8189-81-7785) to be redeveloped for commercial uses; the project area is approximately 0.7 acres.

5.5 Total 1st Permit Cycle POC Load Reduction Requirements

[9VAC25-890-40 Section 1 C.2.a. (5), (7), (8)]

The total POC load reduction requirements for the first permit cycle to meet Special Conditions 5, 7, and 8 are summarized in Table 5C below.

		Est. Reduction Required (lbs/yr)			
Pollutant	**Subsource**	**Existing Sources**	**New Sources**	**Grandfathered Projects**	**TOTAL**
Nitrogen	Regulated Urban Impervious	13.831	0.0	0.0	13.831
	Regulated Urban Pervious	10.435	0.0	0.0	10.435
				Total:	***24.266***
Phosphorous	Regulated Urban Impervious	2.363	0.0	0.0	2.363
	Regulated Urban Pervious	0.513	0.0	0.0	0.513
				Total:	***2.876***
Total Suspended Solids	Regulated Urban Impervious	2135.316	0.0	0.0	2,135.316
	Regulated Urban Pervious	265.656	0.0	0.0	265.656
				Total:	***2,400.972***

Table 5C: Total 1st Permit Cycle POC Load Reduction Requirements

6.0 MEANS & METHODS TO MEET THE POC LOAD REDUCTIONS

[9VAC25-890-40 Section 1 C.2.a. (6), (7), (8)]

6.1 Street Sweeping

The Town will take credit for its existing street sweeping program to meet required POC reductions for the first permit cycle. As noted in Town's MS4 Program Plan dated 12-1-15, the Town maintains a schedule to sweep every street, approximately 21.7 curb miles, at least monthly using a regenerative sweeper. Approximately half the streets are swept more than once per month, depending on the weather conditions. The Town will maintain this level of effort for each MS4 permit cycle and revise documentation of the amount of debris collected, as needed and as additional lane miles may be added to the street sweeping program.

Using the Qualifying Street Lanes Method outlined in the TMDL Guidance, the following Table 6A summarizes reductions achieved through the Town's street sweeping program.

Lane Miles Swept:	21.67 miles			
Acres Swept:	26.27 acres			
Regenerative/Vacuum Street Sweeping				
Pollutant	**Estimated Pre-Sweep Annual Nutrient Loading Rate (lbs/acre/yr)**	**Pre-Sweep Annual Baseline Load (lbs/yr)**	**Pick-up Factors**	**Total Credit (lbs/yr)**
Nitrogen	15.4	404.51	0.05	20.23
Phosphorous	2.0	52.53	0.06	3.15
Total Suspended Solids	1300	34,146.67	0.25	8536.67

Table 6A: Estimate of Current Street Sweeping Reductions

The Town's current street sweeping program provides an excess of the first permit cycle's required reductions for phosphorous and total suspended solids as shown in Table 6C below; however, the nitrogen removal requirement is not met.

6.2 Credit for BMPs Installed Prior to July 1, 2009

The Town proposes to utilize credit from an existing bioretention basin east of Town Hall to meet the first permit cycle POCs removal requirements; refer to Appendix C for Figure BMP-A showing the location of the existing bioretention facilities. BMP-A was completed in 2008. Calculations assume the bioretention facility is a Level 1 facility. Refer to Table 6B for a summary of BMP-A POC load reductions.

Pollutant	Subsource	Total Existing (Est.) Acres Served by BMP-1	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load	VA SW BMP Clearinghouse Efficiency for Bioretention Level 1	Total Est. Reduction Achieved (lbs/yr)
Nitrogen	Regulated Urban Impervious	0.64	16.86	10.77	64%	6.895
	Regulated Urban Pervious	0.08	10.07	0.80	64%	0.509
			Total:	***11.57***		***7.404***
Phosphorous	Regulated Urban Impervious	0.64	1.62	1.04	55%	0.569
	Regulated Urban Pervious	0.08	0.41	0.03	55%	0.018
			Total:	***1.07***		***0.587***
Total Suspended Solids	Regulated Urban Impervious	0.64	1171.32	748.47	55%	411.660
	Regulated Urban Pervious	0.08	175.80	13.89	55%	7.639
			Total:	***762.36***		***419.299***

Table 6B: Total POC Estimated Load Reductions from Existing BMP-A

6.3 Additional Means and Methods

The Town reserves the right to implement and take credit for additional facilities or practices as provided for in the Chesapeake Bay TMDL Special Condition Guidance. Reductions achieved will be documented to DEQ in the Town's annual report.

6.4 POC Reduction Goals through Action Plan Implementation

			BMP Implementation Estimated Reduction of POC (lbs/yr)			
Pollutant	**Subsource**	**1st Permit Cycle Total Est. Reduction Required (lbs/yr)**	**Street Sweeping**	**Exist. BMP A - Bioretention**	**Total Est. Acheived**	**Total Add'l Required for 1st Permit Cycle (lbs/yr)**
Nitrogen	Regulated Urban Impervious	13.831	20.225	6.895	27.120	-13.289
	Regulated Urban Pervious	10.435	0.000	0.509	0.509	9.925
	Totals:	*24.266*	20.225	7.404	*27.630*	***-3.364***
Phosphorous	Regulated Urban Impervious	2.363	3.152	0.569	3.721	-1.359
	Regulated Urban Pervious	0.513	0.000	0.018	0.018	0.496
	Totals:	*2.876*	3.152	0.587	*3.739*	***-0.863***
Total Suspended Solids	Regulated Urban Impervious	2135.316	8536.667	411.660	8948.327	-6813.011
	Regulated Urban Pervious	265.656	0.000	7.639	7.639	258.017
	Totals:	*2400.972*	8536.667	419.299	*8955.966*	***-6554.993***

Table 6C: Total Estimated POC Reductions Achieved with Action Plan Implementation in the 1st Permit Cycle

7.0 ESTIMATED COSTS FOR ACTION PLAN IMPLEMENTATION

[9VAC25-890-40 Section 1 C.2.a. (11)]

Since street sweeping is incorporated into the Town's current budget and the bioretention is an existing facility, no significant capital expenditures are anticipated to comply with the first permit cycle requirements for POC reductions.

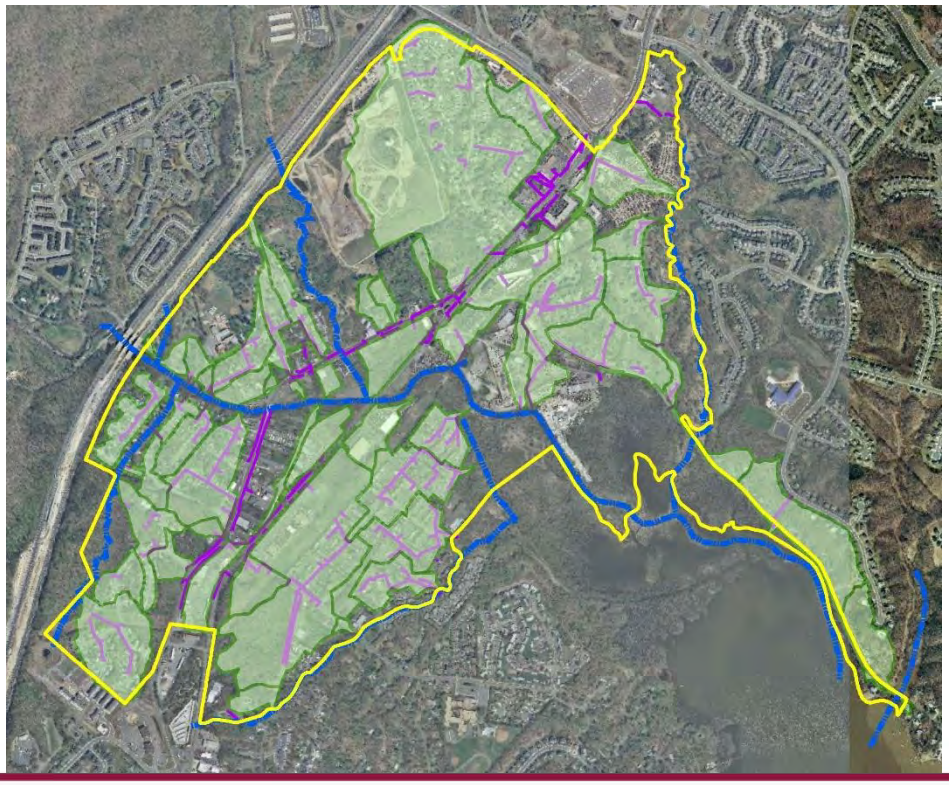
APPENDIX A – MS4 PROGRAM PLAN

APPENDIX B – PUBLIC COMMENTS

APPENDIX C – BMP-A EXISTING BIORETENTION BASIN

CHESAPEAKE BAY TMDL ACTION PLAN

MS4 Permit Cycle 2018 - 2023
Town of Dumfries



PREPARED FOR:

Town of Dumfries
17755 Main Street
Dumfries, Virginia 22026

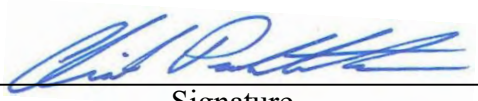
April 4, 2016
Revised April 25, 2016

Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA Project Number: **B15147-01**

3RD PARTY REVIEW

This Report has been subjected to technical and quality reviews by:



Name: Clint Pendleton, EIT — Signature — 4/25/2016 Date
Project Engineer

Name: Carolyn A. Howard, PE — Signature — 4/25/2016 Date
Project Manager

Name: Lindsay B. Lally, PE — Signature — 4/252016 Date
Quality Reviewer

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FIGURES

APPENDIX

1.0 INTRODUCTION

Since 2003, the Town of Dumfries (Town) has been subject to the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit). The Town's most recent permit (VAR040117) was issued by the Virginia Department of Environmental Quality (DEQ) effective July 1, 2013 and will expire June 30, 2018; this permit time period is hereinafter referred to as the first permit cycle.

The second MS4 permit cycle will be effective July 1, 2018 and will expire June 30, 2023. As of the date of this report, it is anticipated the second permit cycle will require an additional 35 percent pollutant reductions for nitrogen (N), phosphorus (P), and total suspended solids (TSS). The required pollutant of concern (POC) reductions are based on the impervious and pervious (managed turf) acreage within the MS4 service area and the required reduction in loading rates for the Potomac River Basin based on Table 3b found in the Department of Environmental Quality's (DEQ) Chesapeake Bay TMDL Special Condition Guidance document dated 05/18/2015 (DEQ Guidance).

This Action Plan recommends implementation of stormwater best management practices (BMPs) to reduce the applicable pollutants of concerns (POC) as currently required for the second permit cycle.

2.0 POC REQUIRED OFFSETS

2.1 Estimated 2nd Permit Cycle POC Load Reduction Requirement

During the first permit cycle, the proposed best management practice (BMP) implementation plan as outlined in the Town's Action Plan results in a 'credit' of pollutant removal for the POCs, as shown in Table 2A below.

			BMP Implementation Estimated Reduction of POC (lbs/yr)			
Pollutant	**Subsource**	**1st Permit Cycle Total Est. Reduction Required (lbs/yr)**	**Street Sweeping**	**Exist. BMP A - Bioretention**	**Total Est. Acheived**	**Total Add'l Required for 1st Permit Cycle (lbs/yr)**
Nitrogen	Regulated Urban Impervious	13.831	20.225	6.895	27.120	-13.289
	Regulated Urban Pervious	10.435	0.000	0.509	0.509	9.925
	Totals:	*24.266*	20.225	7.404	*27.630*	***-3.364***
Phosphorous	Regulated Urban Impervious	2.363	3.152	0.569	3.721	-1.359
	Regulated Urban Pervious	0.513	0.000	0.018	0.018	0.496
	Totals:	*2.876*	3.152	0.587	*3.739*	***-0.863***
Total Suspended Solids	Regulated Urban Impervious	2135.316	8536.667	411.660	8948.327	-6813.011
	Regulated Urban Pervious	265.656	0.000	7.639	7.639	258.017
	Totals:	*2400.972*	8536.667	419.299	*8955.966*	***-6554.993***

Table 2A: Total POC Estimated Reductions Achieved during the 1st Permit Cycle

The resulting estimated pollutant removals for the second permit cycle are shown in Table 2B below.

Pollutant/Subsource		A 1st Permit Cycle Total Est. Reduction Required (lbs/yr)	B Total Est. Acheived Reduction with 1st Permit Cycle BMPs (lbs/yr)	C Total Est. 2nd Permit Cycle Reduction Required (lbs/yr)	D Total Add'l Required for 2nd Permit Cycle (lbs/yr): (A+C)-B
Nitrogen					
	Regulated Urban Impervious	13.831	27.1204	96.817707	83.5284
	Regulated Urban Pervious	10.435	0.5091	73.041738	82.9671
Totals:		*24.266*	*27.6295*	*169.859445*	***166.4955***
Phosphorous					
	Regulated Urban Impervious	2.363	3.7213	16.538256	15.1795
	Regulated Urban Pervious	0.513	0.0178	3.593455	4.0890
Totals:		*2.876*	*3.7392*	*20.131711*	***19.2685***
Total Suspended Solids					
	Regulated Urban Impervious	2135.316	8948.3271	14947.214520	8134.2038
	Regulated Urban Pervious	265.656	7.6385	1859.590425	2117.6077
Totals:		*2400.972*	*8955.9656*	*16806.804945*	***10251.8115***

Table 2B: Total Additional Estimated POC Reductions Required for 2nd Permit Cycle

3.0 MEANS & METHODS TO MEET POC LOAD REDUCTIONS

3.1 Potential BMPs

Various potential BMPs were reviewed and evaluated throughout the Town, including new BMPs, retrofitting existing features, and stream restoration to comply with the second permit cycle pollutant removal requirements. The main criteria for determining whether a BMP is viable and cost-effective is the size and characteristics of the BMPs contributing drainage area (CDA). The BMPs CDA must be within the MS4 area and include a substantial impervious area. For the purposes of this plan, Town-owned properties were first evaluated; refer to Appendix A for figures of each area described below.

1. Dominion Drive: This parcel (GPIN 8189-61-4333) located adjacent to Dominion Drive between Curtis Drive and Lyda Lane was considered for a BMP location; however, the Lyda Lane stream restoration provided significantly more POC reductions to meet the second permit cycle requirements (refer to Section 3.1).

2. Merchant Park: The park site has a small MS4 CDA with a limited amount of impervious area. The cost of BMP implementation would outweigh the pollutant removal realized, and, therefore, this site was deemed not viable.

3. Tebbs Lane: This parcel (GPIN 8188-69-1470) located north of Tebbs Lane and west of Wilmer Porter Court was considered for a BMP retrofit; however, due to the steep topography, there is limited space for improvements. There is also high potential for encountering existing emergent wetlands; therefore, this site was deemed not viable.

4. Ginn Memorial Park: The park site has a small MS4 CDA and limited amount of impervious area. The cost of BMP implementation would outweigh the pollutant removal realized, and, therefore, this site was deemed not viable.

5. Old Dumfries Waste Water Treatment Plant (WWTP): The old WWTP site has a small contributing MS4 drainage area. The cost of BMP implementation would outweigh the pollutant removal realized, and, therefore, this site was deemed not viable.

3.2 Nutrient Credit Purchase Option

In accordance with § 62.1-44.19:21 of the Code of Virginia, "an MS4 permittee may acquire, use, and transfer nutrient credits for purposes of compliance with any waste load allocations established as effluent limitations in an MS4 permit …." This applies to POCs for phosphorous, nitrogen, and sediment; purchase of sediment reduction credits was signed into law by the Governor on March 1, 2016.

> *The permittee may use such credits for compliance purposes only if (i) the credits, whether annual, term, or perpetual, are generated and applied for purposes of compliance for the same calendar year; (ii) the credits are acquired no later than a date following the calendar year in which the credits are applied as specified by the Department consistent with the permittee's Virginia Stormwater Management Program (VSMP) permit annual report deadline under such permit; (iii) the credits are generated in the same locality or tributary, …; and (iv) the credits either are point source nitrogen or point source phosphorus credits generated by point sources covered by the general permit issued pursuant to § 62.1-44.19:14, or are certified pursuant to § 62.1-44.19:20. An MS4 permittee may enter into an agreement with one or more other MS4 permittees within the same locality or within the same or adjacent eight-digit hydrologic unit code to collectively meet the sum of any waste load allocations in their permits. Such permittees shall submit to the Department for approval a compliance plan to achieve their aggregate permit waste load allocations.*

Currently, there is one non-point source nutrient credit bank within the Town's HUC code 02070011 with 33 and 516 available nutrient credits for phosphorous and nitrogen, respectively. There are three (3) non-point source nutrient credit banks within the adjacent HUC. Refer to Appendix B. The cost per pound of POC removal for phosphorus and nitrogen as of this date is approximately $25,000. Information regarding sediment reduction credit costs have not been released as of this date.

If the Town selected this option, it would cost the Town approximately $4.7 million (based on the market as of this date) for the required second permit cycle pollutant reductions for phosphorous and nitrogen only. This option is not recommended due to its high cost and the additional cost required to implement BMPs or purchase future credits for sediment removal. It is more cost-effective and efficient for the Town to implement BMPs that address the three POCs.

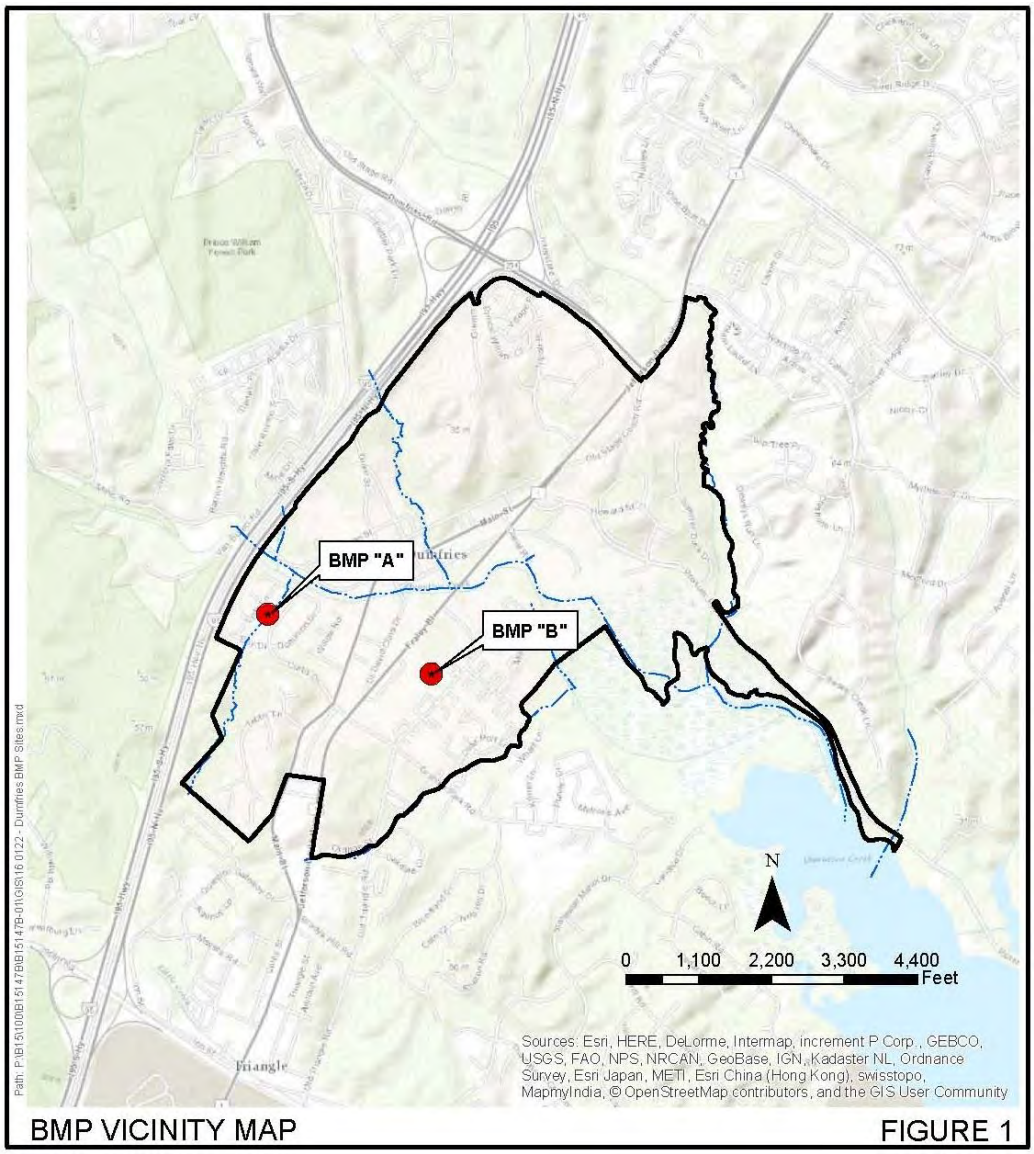
3.3 Recommended BMPs

The following are recommended BMPs based on a desktop review and our knowledge of the Town and its infrastructure; other BMP opportunities may be available in addition to those provided below to meet the required POC reductions for the second permit cycle. The BMPs suggested below will require easements and/or purchase of parcels, and perpetual maintenance of the BMPs.

The recommended BMPs are listed below; the location of each BMP is shown on Figure 1.

BMP A: Lyda Stream Restoration

BMP B: Old Triangle Road New Wet Pond



A summary of compliance with the second permit cycle anticipated requirements are shown in Table 3A.

		2nd Permit Cycle BMP Implementation Estimated Reduction of POC (lbs/yr)			
Pollutant	**2nd Permit Cycle Total Est. Reduction Required (lbs/yr)**	**A - Lyda Stream Restoration**	**B - Old Triangle Rd New Wet Pond**	**Total Est. Acheived**	**Required for 2nd Permit Cycle**
Nitrogen	166.4955	66.65	131.80	198.45	-31.95
Phosphorous	19.2685	64.13	14.78	78.91	-59.64
Total Suspended Solids	10251.8115	42263.77	11179.30	53443.07	-43191.26

Table 3A: Summary of Estimated POC Achieved with Recommend 2nd Permit Cycle BMP Implementation

The nitrogen reduction requirements for the second permit cycle necessitated the recommendation for BMP B; BMP A exceeds requirements for P for both the second and third permit cycles, and TSS removal for the second cycle.

3.4 Lyda Stream Restoration & Outfall Regeneration

A stream lies southeast of Lyda Lane and northwest of Curtis Drive running parallel to both roads in the rear yards of a single-family residential subdivision. This channel is a tributary to Quantico Creek. The recommended limits of the restoration are from the edge of the forested area south of Eby Drive northeast parallel to Lyda Lane, to and including the outfall of culvert under Dominion for a distance of approximately 950 feet; refer to Figure 2.

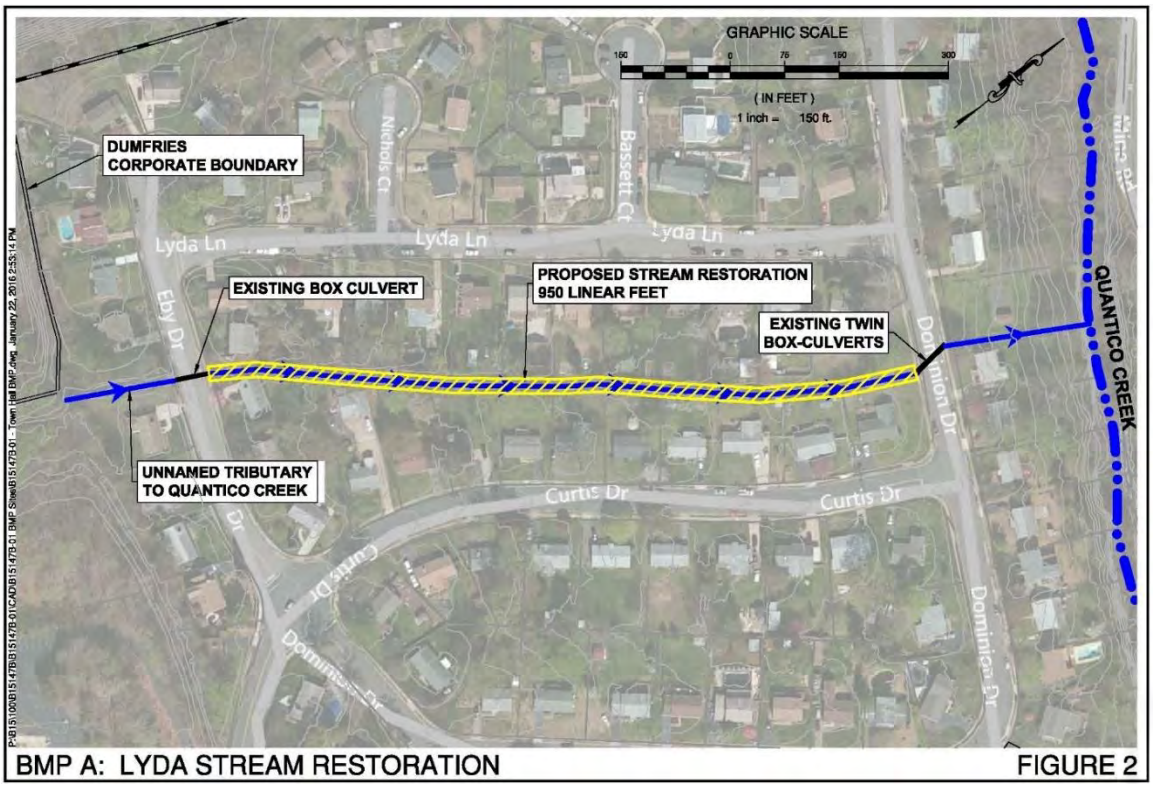


Table 3B summarizes the CDA characteristics to this portion of the stream.

	Urban Impervious Acres	Urban Pervious Acres	Total Urban Acres	Forested Acres	Overall Total
Regulated Land	11.5	27.7	39.2	5.8	45.0
Unregulated Land	1.3	4.4	5.7	37.5	43.2
Total:	*12.8*	*32.1*	*44.9*	*43.3*	***88.2***

Table 3B: Contributing Drainage Area Characteristics

Using the protocols provided in the DEQ Guidance, Appendix V.J. – Urban Stream Restoration, the initial POC reductions are calculated by multiplying the length of the restoration by the interim approved removal rates for each POC, as provided in Table V.J.1 of the Guidance document, and by the ratio of the land type with the CDA. Table 3C summarizes the initial POC reductions from the proposed stream restoration.

Pollutant	Interim Approved Removal Rates (lbs/LF)	POC Reductions (lbs/yr)	Acreage Ratio	Initial Reductions (lbs/yr)
Nitrogen	0.075	71.25		
Regulated Land			0.4444444	31.667
Unregulated Land			0.0646259	4.605
Forested			0.4909297	34.979
Phosphorous	0.068	64.60		
Regulated Land			0.444444	28.711
Unregulated Land			0.064626	4.175
Forested			0.490930	31.714
Total Suspended Solids	44.88	42636.00		
Regulated Land			0.444444	18949.333
Unregulated Land			0.064626	2755.388
Forested			0.490930	20931.279

Table 3C: Initial POC Reductions from the Proposed Stream Restoration

The baseline POC loading for all three permit cycles from unregulated urban impervious and pervious areas within the CDA must be calculated; refer to Table 3D below.

Pollutant	1st Permit Cycle Loading Rate (lbs/ac/yr)	Total Baseline Loading Rate (lbs/ac/yr)	Area (acres)	Total Baseline Loading (lbs/yr)
Nitrogen				
Unregulated Urban Impervious	0.076	1.517	1.300	1.973
Unregulated Urban Pervious	0.030	0.604	4.400	2.658
Phosphorous				
Unregulated Urban Impervious	0.013	0.259	1.300	0.337
Unregulated Urban Pervious	0.001	0.030	4.400	0.131
Total Suspended Solids				
Unregulated Urban Impervious	11.713	234.264	1.300	304.543
Unregulated Urban Pervious	0.769	15.383	4.400	67.683

Table 3D: Total Baseline Reductions from the Proposed Stream Restoration

The total allowable reductions from unregulated urban areas is determined by subtracting the baseline loading from the initial reductions; refer to Table 3E below.

Pollutant	Initial Reductions (lbs/yr)	Total Baseline Loading (lbs/yr)	Total Allowable Reductions (lbs/yr)
Nitrogen			
Unregulated Urban	4.605	4.631	0.000
Phosphorous			
Unregulated Urban	4.175	0.468	3.707
Total Suspended Solids			
Unregulated Urban	2755.388	372.226	2383.162

Table 3E: Total Allowable Unregulated Area Reductions

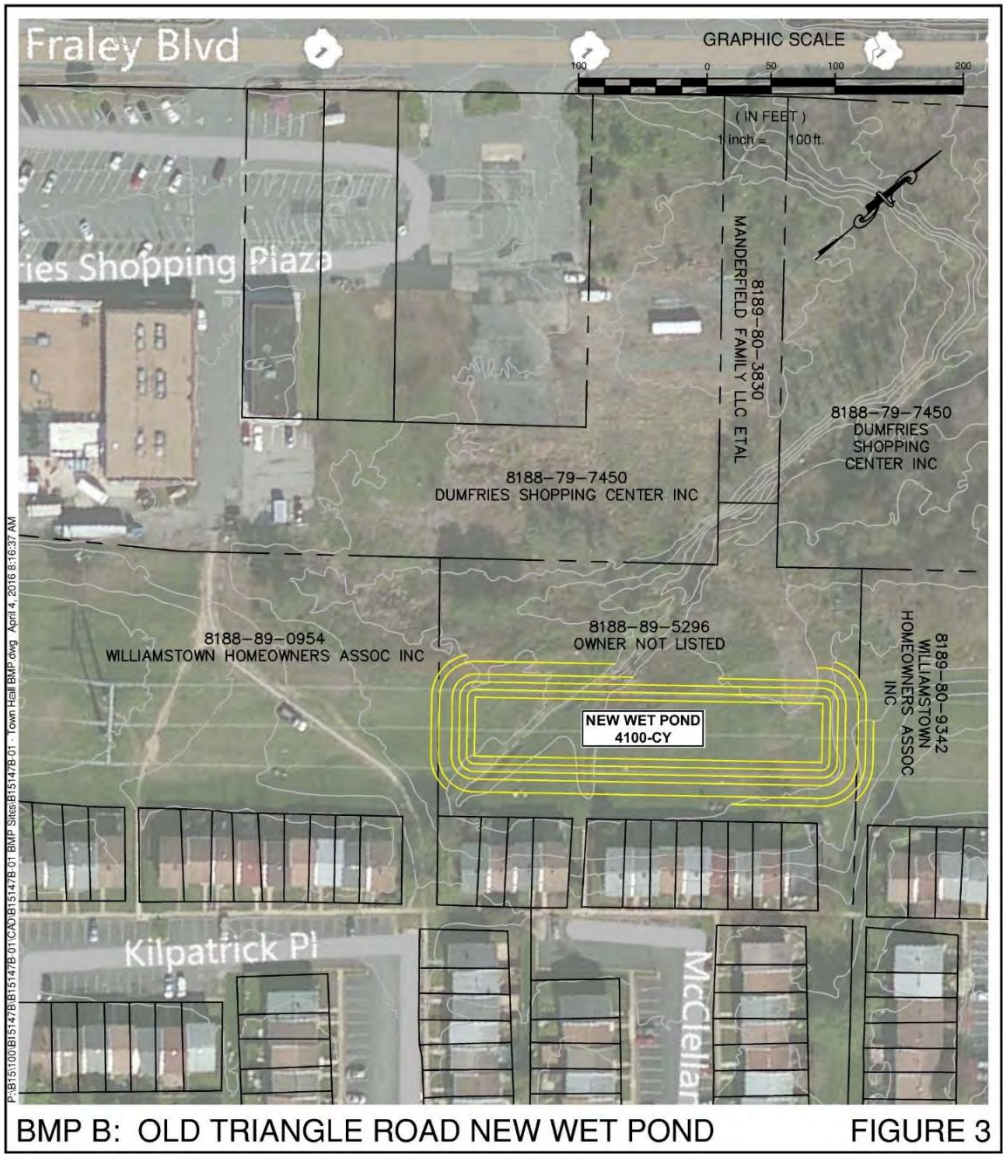
The total POC reductions resulting from the stream restoration is the sum of the initial reductions from regulated and forested areas and the allowable unregulated reductions for the CDA; refer to Table 3F below.

Pollutant	Regulated Areas (lbs/yr)	Un-regulated Urban Areas (lbs/yr)	Forested Areas (lbs/yr)	Total Reductions (lbs/yr)
Nitrogen	31.667	0.000	34.979	**66.645**
Phosphorous	28.711	3.707	31.714	**64.132**
Total Suspended Solids	18949.333	2383.162	20931.279	**42263.774**

Table 3F: Total Allowable Reductions from CDA

3.5 Old Triangle Road New Wet Pond

There are two culverts that discharge into the Dominion Power right-of-way northeast of Kilpatrick Place and north of Old Triangle Road. If an easement could be negotiated with Dominion, a wet pond could be constructed to provide additional POC removal from the MS4 area. Refer to Figures 1 and 3. The wet pond (level 1 minimum) shall be designed and constructed as per the criteria found in the Virginia DEQ Stormwater Design Specification No. 14 – Wet Pond.



BMP B: OLD TRIANGLE ROAD NEW WET POND FIGURE 3

Calculations for POC removals were completed as per the DEQ Guidance, Appendix V.A – Virginia Stormwater Clearinghouse BMPs. Removal efficiencies for N and P were taken from Table V.A.1, and TSS from Table V.C.1 of the DEQ Guidance; refer to Tables 3G and 3I for summary of compliance calculations.

	Urban Impervious Acres	Urban Pervious Acres	Total Urban Acres	Forested Acres	Overall Total
Regulated Land	12.5	22.7	35.2	15.3	50.5
Unregulated Land	0.0	0.0	0.0	0.0	0.0
Total:	*12.5*	*22.7*	*35.2*	*15.3*	***50.5***

Table 3G: Contributing Drainage Area Characteristics

	Total Existing (Est.) Acres Served by Basin	2009 EOS Loading Rate (lbs/ac/yr)	Estimated Total POC Load (lbs/yr)
Nitrogen			
Urban Impervious	12.50	16.86	210.75
Urban Pervious	22.70	10.07	228.59
Totals:	*35.20*	*26.93*	*439.34*
Phosphorous			
Urban Impervious	12.50	1.62	20.25
Urban Pervious	22.70	0.41	9.31
Totals:	*35.20*	*2.03*	*29.56*
Total Suspended Solids			
Urban Impervious	12.50	1171.32	14641.50
Urban Pervious	22.70	175.80	3990.66
Totals:	*35.20*	*1347.12*	*18632.16*

Table 3H: Estimated POC Load from CDA

Nutrient	Estimated Total POC Load (lbs/yr)	Efficiency Removal Rate	Estimated POC Reduction (lbs./yr.)
Nitrogen	439.34	30%	131.80
Phosphorus	29.56	50%	14.78
Sediment	18632.16	60%	11179.30

Table 3I: Estimated POC Reduction from Wet Pond (Level 1)

4.0 ESTIMATED COSTS FOR IMPLEMENTATION

Using best available information and recent bids for similar projects, the following estimated range of probable project costs, including design, permitting, easement / rights-of-way acquisition, and construction, are provided for each BMP.

A. Lyda Stream Restoration and Outfall Regeneration .....$ 400,000 – 520,000

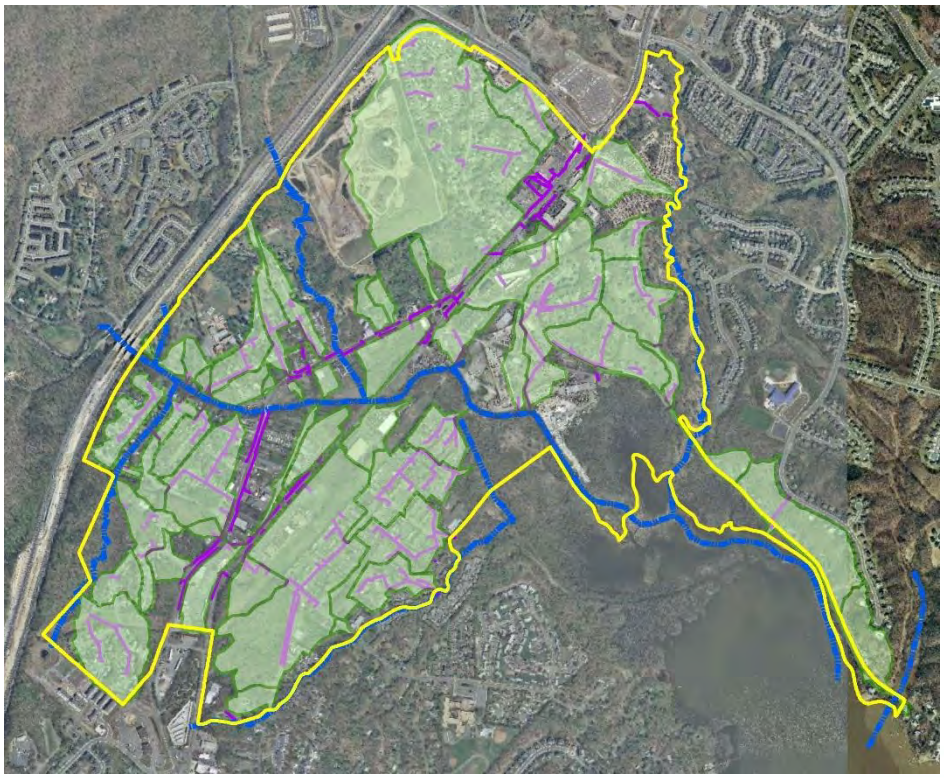
B. Old Triangle Road New Wet Pond .....$ 760,000 – 900,000

APPENDIX A – EVALUATED BMPS

APPENDIX B – VIRGINIA NONPOINT SOURCE NUTRIENT CREDIT REGISTRY, 2/12/2016

LOCAL TMDL ACTION PLAN
E. COLI TMDL FOR QUANTICO CREEK

Town of Dumfries



PREPARED FOR:

Town of Dumfries
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August 2, 2016

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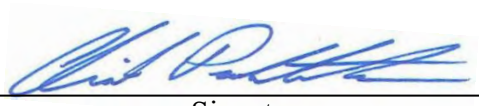

8/2/2016

Name: Clint Pendleton, EIT — Signature — Date
Project Engineer

8/2/2016

Name: Carolyn A. Howard, PE — Signature — Date
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Name: Lindsay B. Lally, PE — Signature — Date
Quality Reviewer

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APPENDICIES

1.0 INTRODUCTION

Since 2003, the Town of Dumfries (Town) has been subject to the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 Permit). In general, the MS4 permit regulates existing storm sewer systems to reduce the potential for stormwater pollution. The permit also requires compliance for systems discharging to a waterbody with a Total Maximum Daily Load (TMDL) that assigns a Waste Load Allocation (WLA) to the permit holder. The permit holder must prepare a TMDL Action Plan to reduce the applicable pollutants of concerns (POC) through the construction of structural stormwater BMPs, non-structural operational measures, or a combination of the two.

Currently, there are two TMDLs with WLA reduction requirements for the Town – 1) the Chesapeake Bay TMDL and 2) an *E. coli* TMDL for Quantico Creek- "Bacteria Total Maximum Daily Load (TMDL) Development for Tributaries to the Potomac River: Prince William and Stafford Counties" report, which includes the TMDL for Quantico Creek. This report assigned the WLA for *E. coli* to the Town and specifies that the load from the Town includes VDOT to meet water quality standards. The Town will address the TMDL WLAs for stormwater through BMPs are described in this TMDL Action Plan, specifically to their application to reductions in E. coli discharges to the MS4. Compliance to the MS4 special conditions is demonstrated through:

1. Implementation of best management practices (BMPs) and associated policies and procedures found in the Town's MS4 Program Plan (Appendix D);
2. BMPs beyond those required by the MS4 General Permit;
3. Enhancement of the Town's MS4 Public Education and Outreach and Training Plans; and
4. A methodology to measure Action Plan effectiveness through MS4 annual reporting.

DEQ issued a guidance document for compliance with local TMDLs. "Local TMDL MS4 Guidance" was issued May 29, 2015 as a draft. This document was prepared in compliance with the guidance.

2.0 WATERSHED ANALYSIS

The Quantico Creek watershed and its relation to the Town is shown in Figure 1.

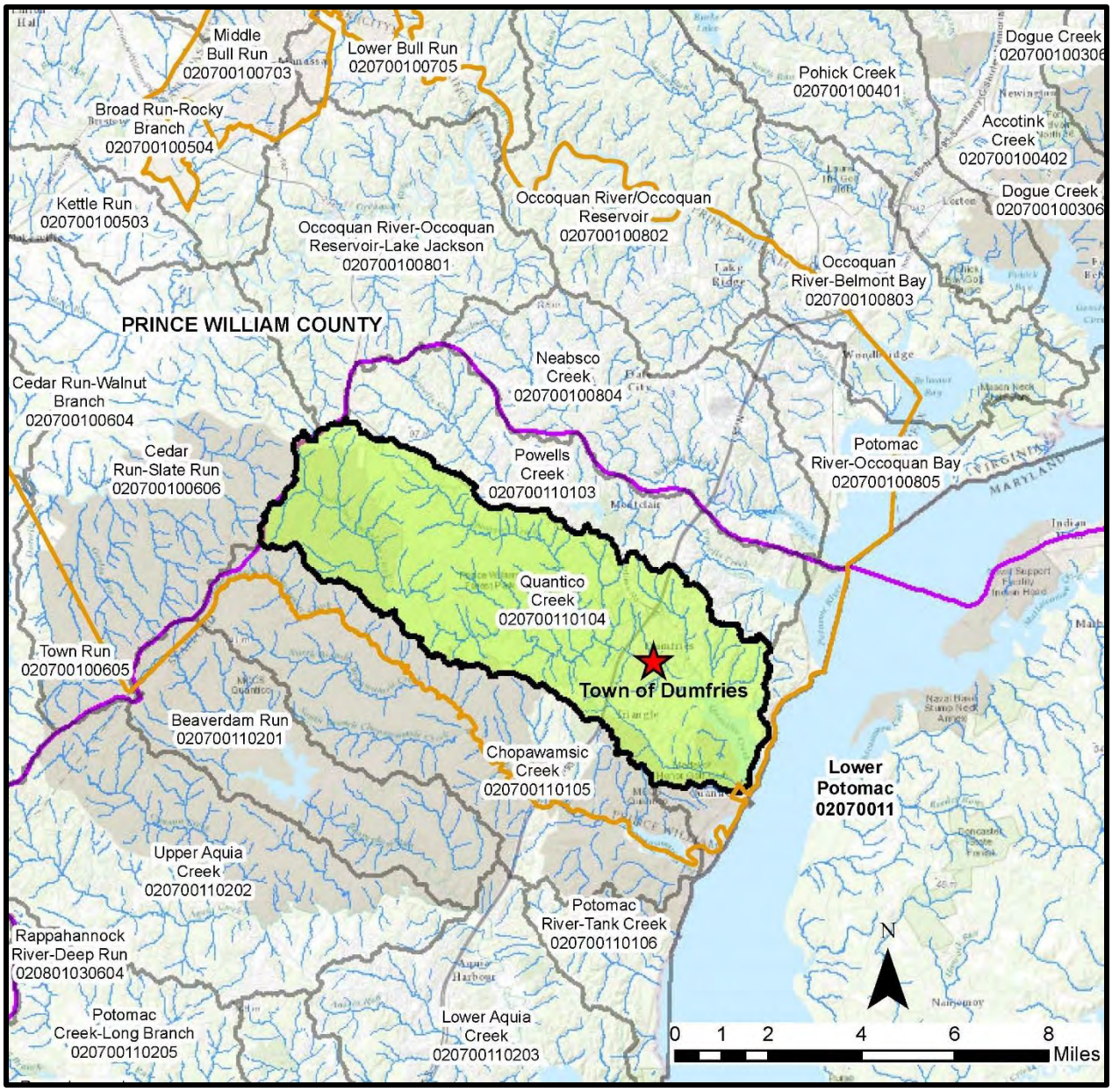

Figure 1: Quantico Creek Watershed

A map of the Town and MS4 service area within the TMDL watershed is attached in Appendix A. Approximately 986.93 acres of the Quantico Creek Watershed lies within the Town's boundary, of which 575.57 acres is within the Town's MS4 service area.

3.0 SOURCE ANALYSIS

The TMDL included data from one (1) sampling point - Station1aQUA004.46 - located at the Route 1 (Business) bridge crossing of Quantico Creek. 27 samples were taken at this station from January 1, 2003 – December 31, 2008; 7 out of 27 samples (26%) exceeded the maximum water quality assessment criterion (235 cfu/100ml) for E. coli.

According to the TMDL Report Section 1.4.2.2, the primary sources of E. coli are wildlife and residential waste under both wet weather, high flow and dry weather, low flow conditions. Therefore, the Action Plan must address both conditions.

3.1 Local E. Coli Sampling

The Prince William County Soil & Water Conservation District collects and reports the results of E. coli sampling along Quantico Creek. There are four (4) sampling locations adjacent to or within the Town limits; refer to Figure 1 taken from page 15 of the Town of Dumfries MS4 Annual Report dated November 10, 2014.

- D1: Upstream of I-95
- D2: Downstream of I-95
- D3: Downstream of southbound US Route 1
- D4: Downstream of northbound US Route 1

Of the 100 samples taken from July 1, 2013 to June 22, 2014, 24 (16 from D3 and D4) exceeded the maximum water quality assessment criterion (235 cfu/100ml) for E. coli.

Coliscan Sampling Results

Site	D1	D2	D3	D4	Rainfall past 24 Hours (")
Lat	38.56861	38.56775	38.56586	38.5661	
Long	-77.33592	-77.33481	-77.329	-77.32437	
	E coli Colony Forming Units per 100 mL				
7/1/2013	125	100	950	775	0.53
7/17/2013	175	125	325	850	none
8/5/2013	25	50	50	50	none
8/19/2013	200	350	150	100	0.84
9/2/2013	20	20	20	20	0.1
9/7/2013	25	50	300	275	none
10/11/2013	1950	1750	3200	3050	0.9
10/28/2013	20	20	20	25	none
11/17/2013	50	20	25	20	0.3
12/15/2013	50	50	75	175	0.3
12/29/2013	1200	750	1125	975	1.31
1/15/2014	50	20	75	25	0.2
1/26/2014	20	20	20	20	0.02
2/1/2014	20	20	20	20	none
2/17/2014	20	25	20	20	none
3/16/2014	20	20	25	75	none
3/29/2014	50	20	100	25	0.22
4/14/2014	25	20	20	50	0.16
4/15/2014	950	650	925	975	0.67
4/29/2014	100	75	150	600	0.38
4/30/2014	350	20	325	375	2.6
5/21/2014	75	75	25	25	0.02
6/3/2014	50	25	50	20	none
6/14/2014	75	75	200	250	0.56
6/22/2014	20	20	25	25	0.16

Figure 1

3.2 Residential Waste

3.2.1 Septic Systems

Leaks, overflows, and illicit connections from sanitary sewers are a potential source of observed bacteria. There are no known overflows or illicit discharges within the Town limits. There are some parcels within the Town without connection or without record of connection to the Prince William County Service Authority's public sanitary sewer systems. These parcels are noted in Appendix B - Town of Dumfries Onsite Sewer Review Map and summarized below.

- 25 parcels with buildings **constructed prior to 1950** are presumed to have onsite septic systems; the Service Authority does not have record of connection to the public sewer system for these parcels.
- Two (2) parcels with buildings have known **onsite sewer** systems.

Note: Appendix B labels some parcels as 'public sewer'; connections to the public sewer for these parcels were previously unknown and were verified by the Prince William County Service Authority to have a connection to the public sewer. Undeveloped parcels are excluded from the mapping.

3.2.2 Pet Waste

Additionally, improper disposal of pet waste can be a potential source of observed bacteria in the watershed. The Town has a detailed Public Education and Outreach Program (Appendix C) specifically designed to address and minimize impacts of pet waste on Quantico Creek. The plan incorporates written material and active engagement of citizens.

> *The brochure will address pet waste as a major source of the bacteria found in waters within the Town that needs to be reduced. Topics that will be addressed: Why pet waste is a concern; how it can impact local water by affecting bacteria levels; and simple ways to keep pet waste out of water. Local contact information and sources for additional information will be included.*
>
> *Brochures will be distributed to HOAs within the MS4 permit area along with a cover letter explaining the importance of the brochure and its intended use. Follow-up with communication with HOA points of contact will be critical to ensuring effectiveness.*

3.3 Wildlife

The TMDL specifically cites wildlife as a potential source of observed bacteria in the watershed. There are no known elimination programs through DEQ or EPA to eliminate the wildlife source of E. coli. Therefore, this Action Plan will focus on reducing residential / pet waste sources.

4.0 ACTION PLAN COMPONENTS

4.1 General

The following is a summary of the required Local TMDL Action Plan components as provided in the latest DEQ guidance document.

4.1.1 The name(s of the Final TMDL report(s): Bacteria Total Maximum Daily Load (TMDL) Development for Tributaries to the Potomac River: Prince William and Stafford Counties

4.1.2 The pollutant(s) causing the impairment(s): E coli.

4.1.3 The WLA(s) assigned to the MS4 as aggregate or individual WLAs: 3.37E+09 cfu/day or 1.23E+12 cfu/year for E. coli shared by the Town and the Virginia Department of Transportation (VDOT).

As noted in Section 5.3.1 of the Final TMDL Report, "implementation of the WLAs for MS4 permits will focus on achieving the percent reductions required by the TMDL, rather than the individual numeric WLAs. The MS4 WLAs are aggregated by geographic boundary. It is not intended that individual numeric WLAs will be applied towards each permit. Rather, the MS4 permittees are expected to implement programmatic controls aimed at achieving the pollutant reductions identified in this TMDL. Additionally, it is anticipated that the implementation of MS4 WLAs will focus on reducing anthropogenic sources of the pollutant of concern." Anthropogenic sources of pollutants are those that originate from human activity.

The percent reduction required by the TMDL from urban (human and non-point) sources is 92.1%.

4.1.4 Significant sources of POC(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit. A significant source of pollutant(s) from a facility of concern means a discharge where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.

Based on an analysis of the Town's property located within the TMDL watershed, there are no significant sources of E coli, other than the two (2) existing public parks, where the expected pollutant loading is greater than the average pollutant loading for the land use identified in the TMDL.

4.1.5 Existing or new management practices, control techniques, and system design and engineering methods, that have been or will be implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA.

A. Public Education and Outreach Program: Refer to Appendix C. This existing program is specifically designed to address and minimize impacts of pet waste on Quantico Creek. The plan incorporates distribution of written material and active engagement of citizens.

B. E. Coli Sampling: Refer to section 3.1 of this Action Plan. The Town currently and will continue to test for E. coli a minimum of once per month at four (4) sampling points within the Town. Sampling results are found in the Town's MS4 Annual Report. This information will be used to measure the effectiveness of this Action Plan.

C. Sewer Connections / Septic Repair: A primary source of E. coli is residential waste. From information provided by Prince William County Service Authority, there are approximately 27 parcels within the Town that are suspected to have septic systems or unknown connections. The Town will work with the Prince William County Service Authority to incentivize and/or provide connections to pubic sewer systems, if possible, for these facilities, or test and repair, if needed, existing septic systems.

D. Pet Waste Collection: There are two (2) public parks, which are potentially significant contributors, located in the Town: Ginn Memorial Park and Weems-Botts. During this permit cycle, the Town will evaluate the potential for adding pet waste stations at these parks.

4.1.6 Legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the POCs identified in each respective TMDL.

The Town currently has no additional legal authorities applicable to reducing E. coli within the Quantico Creek watershed.

4.1.7 Enhancements to public education, outreach, and employee training programs to also promote methods to eliminate and reduce discharges of the POC(s) for which a WLA has been assigned.

A. Enhanced Public Education and Outreach Program: As previously referenced, the Town's Public Education Outreach Program lists bacteria from pet waste as a high-priority issue. The Program includes written materials and active engagement. During this permit cycle, the Town will update the materials to incorporate general information

regarding the TMDL and E. coli identification, risk factors, and significant sources within the Town.

B. Enhanced Public Participation: The Town will post this Action Plan on their MS4 Program web page. Availability of the Action Plan will increase awareness of the TMDL with web page visitors.

C. Enhanced Employee Training Program: Information regarding E. coli identification, risk factors, and significant sources within the Town will be incorporated into the biannual training events for Town employees. Training will also incorporate an overview of the TMDL, the Town's WLA, and Action Plan.

4.1.8 A schedule of interim milestones and implementation of the items in 4.1.5, 4.1.6, and 4.1.7.

BMP ID	Milestones	Implementation Date
4.1.5 A	Public Education and Outreach Program	Ongoing / Annual (Refer to Appendix B)
4.1.5 B	E. Coli Sampling Reporting	Ongoing / Annual
4.1.5 C	Sewer Connections / Septic Repair - Feasibility Study	30-Jun-17
	Sewer Connections / Septic Repair - Completion for All Parcels within the Town	30-Jun-23
4.1.5 D	Pet Waste Collection at Parks - Evaluation Completed	30-Jun-17
4.1.6	Legal Authorites	N/A
4.1.7 A	Enhanced Public Education and Outreach Program - Complete Development	30-Jun-18
4.1.7 B	Enhanced Public Participation - Post Action Plan to MS4 Web Page	Completed / Updated Annually as needed
4.1.7 C	Enhanced Employee Training Program - Complete Development	30-Jun-18

4.1.9 Methods to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs.

In addition to the methods outlined in Appendix C – Town of Dumfries Public Education Outreach Program dated 12-01-15, Section 5.5, the results of the E. coli sampling will assist in assessing the Action Plan effectiveness.

4.1.10 Measurable goals and the metrics that the permittee and Department will use to track those goals (and the milestones required by the permit). Evaluation metrics other than monitoring may be used to determine compliance with the TMDL(s).

The TMDL aggregates Town's WLA with that of VDOT; there is no practical way to determine a numerical load assigned to the Town as part of the total WLA. Measureable goals will include items such as number of written materials distributed, number of outreach programs provided, numbers of citizens and businesses in attendance at outreach programs, number of septic systems connected to sewer systems or repaired, and number of pet waste collection stations installed. Compliance with the TMDL will be also be tracked by the continuation of the programs described in this document and the results of the E. coli sampling.

APPENDIX A – TOWN OF DUMFRIES MS4 SERVICE AREA MAP

APPENDIX B – TOWN OF DUMFRIES ONSITE SEWER REVIEW MAP

APPENDIX C - PUBLIC EDUCATION AND OUTREACH PROGRAM

quality in the Town. The Town will revise and adapt the PEOP throughout the permit term in order to address noted weaknesses or shortcomings.

APPENDIX D – TOWN OF DUMFRIES MS4 PROGRAM PLAN