MS4 STORMWATER PERMIT

CHESAPEAKE BAY TMDL ACTION PLAN

Prepared For:

Virginia Department of Juvenile Justice

Mr. Robert Wilburn

June 30, 2015

Prepared By:

Draper Aden Associates

Engineering • Surveying • Environmental Services

DAA Project Number: 21162-15

3RD PARTY REVIEW

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

Name: Nicholas Hinebaugh Project Engineer	Signature	Date
Name: Glenn H. Telfer, P.E. Lead Author/Project Manager	Signature	Date
Name: W. Charles Kreye, II, P.E. Quality Reviewer	Signature	Date

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 INTRODUCTION

The Department of Juvenile Justice (DJJ) Bon Air Facility was assigned a Municipal Separate Storm Sewer System (MS4) permit by DEQ in 2013. This report documents permit compliance with the Chesapeake Bay Total Maximum Daily Load (TMDL) provision of the MS4 permit (attached as Appendix 1). DEQ has issued a guidance document, "*Guidance Memo No. 14-2012,*" (attached as Appendix 2) which provides more detailed requirements for compliance.

The Chesapeake Bay TMDL requires the facility to reduce nutrients (nitrogen, phosphorus, and total suspended solids) discharged from existing land cover on an annual basis. The reductions are tied to the next three permit terms, which are five years each. The first term (2013-2018) requires removal of approximately 5% of the total of the required reduction, the second term (2018-2023) requires an additional 35%, and the third term (2023-2028) requires the remaining 60% of the total. At this point, the required removals in the second and third permit terms can only be estimated. It is highly likely that Virginia Department of Environmental Quality (DEQ) will change the required removals state-wide, either upward or downward, based on further sampling and modeling.

The nutrient reductions require the construction of a series of stormwater treatment devices usually referred to as Best Management Practices (BMPs). Guidance issued by DEQ provides the types of allowable BMPs and the treatment efficiency assigned to each. BMPs are required to be inspected and maintained in perpetuity.

This report provides recommended BMPs with a schedule of costs tied to the three permit cycles. The format of report is based on the format provided in the DEQ guidance document.

2.0 ACTION PLAN COMPONENTS

2.1 General

The following is a summary of the required Chesapeake Bay TMDL Action Plan components as provided in the latest DEQ guidance document (Guidance Memo 14-2012, revised 3/19/2015). Following each requirement is a summary of the means of compliance.

1. Current Program and Existing Legal Authority (General Permit Section I.C.2.a.(1))

A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition; Localities should include by reference the components of their current MS4 program, or other relevant legal authorities, that will be used to meet the Special Condition. This should include a list of the relevant existing legal authorities (i.e. ordinances, permits, orders, contracts, inter-jurisdictional agreements, and/or other enforceable mechanisms).

- The permit for the DJJ Bon Air site was issued on July 1, 2013 making this facility a first time permit holder in the current permit cycle (2013-2018). As a state agency, DJJ has full control of development and operations at the Bon Air site.

2. New or Modified Legal Authority (General Permit Section I.C.2.a.(2))

The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition;

New or modified legal authorities that were or will be developed to comply with the Special Condition should be listed. The list should include either (1) why the legal authority was or will be developed or (2) why the existing legal authority needs to be modified. If no new legal authorities are required for permit compliance than a statement as such should be made in place of a list.

- No new legal authorities are required for permit compliance. DJJ fully controls all the property it owns within the TMDL watershed.

3. Means and Methods to Address Discharges from New Sources (General Permit Section I.C.2.a.(3))

The means and methods that will be utilized to address discharges into the MS4 from new sources; "New Sources" means pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009. This Special Condition requirement applies to all new sources that would otherwise require post-development stormwater runoff control, as described in GP Section II.B.54.a. If the new source disturbs one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities, the permittee should see Part VI.6, Part VI.7, and Appendix II of this guidance. Additional offsets may be necessary. If the new source does not utilize an average impervious land cover condition greater than 16% for the design of post development stormwater management facilities no additional offsets are required under the Special Condition beyond those for existing development. Similarly, if a new source disturbs less than 1 acre, no additional offsets are required under the Special Condition beyond those for existing development. The permittee may fulfill this requirement with a short narrative describing the programmatic tools the permittee uses to address new sources, such as adherence with the VSMP regulations for the implementation of post-development stormwater management facilities or description of more stringent local requirements if applicable.

- There have been no development projects at the DJJ Bon Air site on or after July 1, 2009.

4. Estimated Existing Source Loads and Calculated Total Pollutant of Concern (POC) Required Reductions (General Permit Section I.C.2.a.(4) and (General Permit Section I.C.2.a.(5))

An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable [Table/Tables] in this section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate; A determination of the total pollutant load reductions necessary to reduce the annual POC loads

from existing sources utilizing the applicable [Table/Tables] in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4. The POC loads and required reductions should be calculated using the tools described in this guidance document. The permittee should, at a minimum, provide a summary describing how pervious and impervious surface for the MS4 was estimated (e.g. the GIS resources that were used). The Department will need this information to verify that the method used is acceptable. Please see Part II.2 for additional guidance concerning the delineation of these areas. Completed calculation tables from the permit should be submitted.

- Calculations of POC loads are included as Appendix 5. Descriptions of methodology are included in Section 4.0 "Chesapeake Bay TMDL WLA Calculations."

5. Means and Methods to Meet the Required Reductions and Schedule (General Permit Section I.C.2.a.(6))

The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions; This section should describe list the management practices and retrofit programs (including improvements from redevelopment) that have or will be implemented between July 1, 2009 and the end of the first permit cycle to achieve the 5.0% reductions required for existing development. The permittee should support its plan with calculations that show how the reductions will be met. Any credit trading that is used to meet reductions should also be described here. Permittees are encouraged to submit this information in an electronic spreadsheet with a summary page that serves as a ledger showing:

- *the total reductions required;*
- *each practice that will be implemented;*

- *the approximate location of the project, and; the load that will be reduced by each project.*

Permittees should not submit full plans and specs for individual BMPs as part of the Action Plan. However, these plans should be available to the Department upon request. The schedule should include estimates of when new management practices will be initiated, when BMP construction will begin, and when BMP installation is expected to be completed. These estimates can be provided as the annual benchmarks required by the permit. For BMPs that have already been implemented at the time the Action Plan is submitted, the permittee should indicate when they were installed.

- The means and methods to comply with the Chesapeake Bay TMDL are included in Section 5.0 "Recommended Compliance Plan."

6. Means and methods to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2014 (General Permit Section I.C.2.a.(7))

The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall utilize the [applicable table] in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.

Permittees may account for these additional offsets on a site by site basis, but the Department recommends taking an aggregate approach to demonstrate compliance with this Special Condition requirement. At a minimum permittees should provide (1) the total additional POC loads created by "new sources" and (2) the 5.0% of those loads permittees must offset during by the end of this permit cycle. The BMPs that will be implemented to address them should also be included. See Appendix II of this guidance for more information.

- There were no projects that initiated construction between July 1, 2009 and June 30, 2014.

7. Means and methods to offset increased loads from grandfathered projects that begin construction after July 1, 2014 (General Permit Section I.C.2.a.(8))

The means and methods to offset the increased loads from projects as grandfathered in accordance with 9VAC25-870-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of postdevelopment stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids.

Increases in the POC load from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project, in accordance with GP Section I.C.3.c. Permittees should include an estimate of the number of acres impacted by grandfathered projects, which will be used to estimate the pollutant loadings created by these projects. This estimate can be provided as an aggregate. The best available data should be used, but where data is unavailable permittees should use their best professional judgment. The strategies that will be used to address this type of development, including any nutrient trading, should also be included.

- There are no projects that began construction after July 1, 2014 that qualify as grandfathered in accordance with 9VAC25-870-48.

8. A list of future projects, and associated acreage that qualify as grandfathered (General Permit Section I.C.2.a.(10))

A list of future projects and associated acreage that qualify as grandfathered in accordance with 9VAC25-870-48

To fulfill this requirement, permittees should list projects that have been approved or have an obligation of locality, state, or federal funding prior to July 1, 2012, but have not received coverage under the General Permit for Discharges of Stormwater from Construction Activities prior to July 1, 2014. This permit requirement applies solely to new development, not redevelopment projects.

- There are no future projects that qualify as grandfathered in accordance with 9VAC25-870-48.

9. An estimate of the expected cost to implement the necessary reductions (General Permit Section I.C.2.a.(11))

An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle;

This estimate should cover the expected cost to the permittee. Permittees should have a strategy in place to achieve the (1) 5.0% reductions for the existing sources, (2) 5.0% reductions for the new sources that disturb one acre or greater and have an average impervious land cover condition greater than 16% for the design of post-development stormwater management facilities, and (3) any offsets for grandfathered projects that disturb one acre or greater and have an average impervious land cover condition greater than 16% for the design of post-development stormwater management facilities for this permit cycle. Permittees should also begin to plan for the full reductions that will be required by the end of three permit cycles. Permittees are encouraged to be as detailed as possible as this information will be reviewed by the state when it reevaluates the amount of funding that will be available to aid localities with their programs.

- Estimated costs to implement the requirements of the Chesapeake Bay TMDL are included in Section 5.0 "Recommended Compliance Plan."

10.a Public Comments on Draft Action Plan (GENERAL PERMIT REQUIREMENTS) (General Permit Section I.C.2.a.(12))

An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan. The public comment process and period should be described, including how the process was advertised to the public.

- The Chesapeake TMDL Action Plan, this document, will be posted on the DJJ website with an invitation for public comment. The link to the website is: *http://www.djj.virginia.gov/*

  Three will be a 30 day comment period. Comments will be evaluated to determine appropriateness and any cost implications. Revisions to this Action Plan will be made prior to October 1, 2015.

3.0 EXISTING FACILITY

3.1 General

The DJJ Bon Air Facility houses approximately 290 juvenile inmates. Facilities include buildings for housing, education, dining, administration, and facility maintenance. The entire parcel is approximately 402 acres as shown below:

Figure 1 – Aerial Photo – DJJ Bon Air Facility

Chatsworth Avenue (State Route 324) traverses the facility, and DJJ Bon Air maintains the culverts under Chatsworth Avenue.

The majority of the parcel is wooded and is bounded by Old Bon Air Road to the west, Powhite Creek (a tributary of Little Westham Creek) to the north and east, and residential subdivisions to the south.

3.2 Storm Sewer System

The existing storm sewer system was mapped as shown in Appendix 3.The storm sewer system consists mainly of a mixture of ditches, culverts, and connected storm sewer segments with inlet structures.

There are two structural stormwater BMPs that were installed for regulatory compliance as part of past building projects. Locations are shown on the map in Appendix 3.

Table 1: Existing Stormwater BMPs

	Name	Type	Area Treated (Ac)	Year Constructed
1.	Medium Security Facility Basin	Detention – Quantity Only	10.6	1995
2.	Parking Lot Basin	Extended Detention (dry)	1.4	1996

4.0 CHESAPEAKE BAY TMDL WLA CALCULATIONS

4.1 General

The Chesapeake Bay TMDL WLA is based on the impervious and lawn acreage within the MS4 service area as of June 30, 2009. The method multiplies the total impervious area and total managed turf area in the MS4 service area (June 30, 2009 base land cover condition) by coefficients to obtain the total MS4 WLA and the WLA required to be met in the first permit cycle.

4.2 MS4 Service Area Delineation

The DEQ guidance defines the MS4 service area as that area owned by DJJ within the 2000 US Census urbanized area that drains to the storm sewer operated and maintained by DJJ. This area is shown on the map in Appendix 4. This area is approximately 12% of the total property. The reminder of the facility property either does not drain to the MS4 service area or is woods which is not required to be included in the WLA calculation.

4.3 MS4 System Interconnects

The storm sewer culverts under Chatsworth Avenue collect drainage from DJJ property and discharge to DJJ property. Any road drainage is by sheet flow. The DEQ guidance specifically states that in these cases, where the areas drain by sheet flow instead of piped systems, the downstream MS4 (DJJ) is responsible for the WLA.

There are two DJJ outfalls on the west side of the property which convey drainage that is ultimately conveyed by the VDOT ditch system along Old Bon Air Road. The DEQ guidance specifically states that where the areas drain by interconnected storm sewer or other conveyance system, the upstream MS4 is responsible. However, in this case there is no manmade system such as a ditch or pipe connecting the two systems, so there is no interconnect.

4.4 MS4 Land Cover Determination

The land cover within the MS4 service area is shown at Appendix 4. The land cover condition as of June 30, 2009 was determined using GIS based mapping supplemented by record drawings and field observations.

4.5 Additional Loads

The DEQ guidance document requires additions to the WLA due to certain projects initiated between July 1, 2009 and June 30, 2104 under Special Condition Requirements 7 and 8. There were no projects constructed at DJJ Bon Air during this time period.

4.6 MS4 WLA Calculation

The following table provides the WLA required for each MS4 permit cycle:

Table 2: WLA for Each MS4 Permit Cycle

	Removal Requirement		
Permit Period	**N (lb)**	**P (lb)**	**TSS (lb)**
First (2013-2018) 5%	1.4	0.3	129
Second (2018-2023) cumulative 40%, estimated	9.8	2.1	903
Third (2023-2028) cumulative 100%, estimated	16.8	3.6	1,548

Calculations are included at Appendix 5. The current MS4 permit provides the required removal for the current compliance period (2013-2018). The required removals for subsequent removal periods can only be estimated because the total WLA will be revised by DEQ in subsequent permit cycles in response to additional Chesapeake Bay modeling and other factors.

5.0 RECOMMENDED COMPLIANCE PLAN

5.1 General

Projects were evaluated and selected based on their ability to meet the required WLA removals in a cost effective manner that fits with future plans at the DJJ Bon Air Facility and other goals. The estimated removals provided are in excess of the requirements for each permit period in order to create a buffer in case the DEQ guidance changes the allowable BMP treatment efficiencies or questions the calculation methodology for a BMP. As compliance projects are constructed BY DJJ Bon Air, excess P removal can be used to provide compliance for future building projects.

Project locations are shown on the map in Appendix 6. Project budgetary cost estimates are included in Appendix 7. The total budgetary cost for compliance with all three permit cycles is approximately $200,000 in 2015 dollars. This is based on estimates of the total WLA which will be finalized in future permit terms. In the tables below, costs have been increased to account for inflation to the anticipated year of construction, assuming an annual inflation rate of 2.5%.

5.2 Period 1 – 2013 to 2018

Projects are required to be completed by June 30, 2018.

Table 3: Period 1 Chesapeake Bay TMDL Compliance

	Removal Credits			
Project	**N (lb/year)**	**P (lb/year)**	**TSS (lb/year)**	**Budgetary Cost (2018 $)**
A. Tree Planting	16.1	1.5	185	$8,561
First Period WLA Requirements (Actual)	1.4	0.3	129	

5.3 Period 2 – 2018 to 2023

Projects are required to be completed by June 30, 2023.

Table 4: Period 2 Chesapeake Bay TMDL Compliance

	Removal Credits			
Project	**N (lb/year)**	**P (lb/year)**	**TSS (lb/year)**	**Budgetary Cost (2023 $)**
Excess Period 1 Removal	14.7	1.2	56	-
B. Treatment Manhole	27.4	2.0	2,164	$70,058
TOTALS	42.1	3.2	2,220	
Second Period WLA Requirements (Estimated)	9.8	2.1	903	

5.4 Period 3 – 2023 to 2028

Projects are required to be completed by June 30, 2028.

Table 5: Period 3 Chesapeake Bay TMDL Compliance

	Removal Credits			
Project	**N (lb/year)**	**P (lb/year)**	**TSS (lb/year)**	**Budgetary Cost (2028 $)**
Excess Period 2 Removal	32.3	1.1	1,317	-
C. Bioretention	8.2	0.8	308	$189,281
TOTALS	40.5	1.9	1,625	
Third Period WLA Requirements	16.8	3.6	1,548	

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

April 18, 2014

Daryl W. Francis
Deputy Director of Administration and Finance Division
Department of Juvenile Justice
600 East Main Street, Floor 20
Richmond, VA 23219

RE: General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems
General Permit No. VAR040128
Department of Juvenile Justice-Bon Air

Dear Mr. Francis:

We have reviewed your Registration Statement received on February 18, 2014 and determined that the referenced Municipal Storm Sewer System (MS4) is hereby covered under the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems. The effective date of your coverage under this general permit is the date of this letter. The enclosed copy of the general permit contains the applicable reporting requirements and other conditions of coverage.

The general permit will expire on June 30, 2018. The 2018 permit reissuance instructions will be provided to you prior to this expiration date. The Registration Statement to be used for renewing your permit coverage may be different at reissuance, so please do not submit a new Registration Statement before you receive our reminder letter and instructions in 2018.

Please contact Jeff Selengut at jeffrey.selengut@deq.virginia.gov or (804) 698-4265 if you have any questions.

Sincerely,

Allan Brockenbrough, II, P.E.
VPDES Permit Manager
Office of VPDES Permits

Enc. General Permit No. VAR040128

Cc. File

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

General Permit No.: VAR040128

Effective Date: July 1, 2013

Expiration Date: June 30, 2018

GENERAL PERMIT FOR DISCHARGES OF STORMWATER FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS

AUTHORIZATION TO DISCHARGE UNDER THE VIRGINIA STORMWATER MANAGEMENT PROGRAM AND THE VIRGINIA STORMWATER MANAGEMENT ACT

In compliance with the provisions of the Clean Water Act, as amended and pursuant to the Virginia Stormwater Management Act and regulations adopted pursuant thereto, this state permit authorizes operators of small municipal separate storm sewer systems to discharge to surface waters within the boundaries of the Commonwealth of Virginia, except those waters specifically named in State Water Control Board and Virginia Soil and Water Conservation Board regulations which prohibit such discharges.

The authorized discharge shall be in accordance with this cover page, Section I – Discharge Authorization and Special Conditions, Section II – MS4 Program and Section III – Conditions Applicable To All State Permits, as set forth herein. The operator shall utilize all legal authority provided by the laws and regulations of the Commonwealth of Virginia to control discharges to and from the MS4. This legal authority may be a combination of statute, ordinance, permit, specific contract language, order or interjurisdictional agreements.

For operators of small MS4s that are applying for initial coverage under this general permit, the schedule to develop and implement the MS4 Program Plan shall be submitted with the completed registration statement.

For operators that have previously held MS4 state permit coverage, the operator shall update the MS4 Program Plan in accordance with the following schedule. Until such time as the required updates are completed and implemented, the operator shall continue to implement the MS4 Program consistent with the MS4 Program Plan submitted with the registration statement.

Table 1: Schedule of MS4 Program Plan Updates Required in this Permit

Program Update Requirement	Permit Reference	Update Completed By
Public Education Outreach Plan (Minimum Control Measure 1 – Public Education and Outreach on Stormwater Impacts)	Section II B 1	12 months after permit coverage
Illicit Discharge Procedures - (Minimum Control Measure 3 – Illicit Discharge Detection and Elimination)	Section II B 3	
Individual Residential Lot Special Criteria (Minimum Control Measure 5 – Post-Construction Stormwater Management in New Development and Development on Prior Developed Lands)	Section II B 5 c (1) (d)	
Operator-Owned Stormwater Management Inspection Procedures (Minimum Control Measure 5 – Post-Construction Stormwater Management in New Development and Development on Prior Developed Lands)	Section II B 5	
Identification of Locations Requiring SWPPPs (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6 b	
Nutrient Management Plan (NMP) Locations - (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6 c (1) (a)	
Training Schedule and Program - (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6	

Table 1: Schedule of MS4 Program Plan Updates Required in this Permit		
Program Update Requirement	**Permit Reference**	**Update Completed By**
Updated TMDL Action Plans (TMDLs approved before July of 2008) – (Special Conditions for Approved Total Maximum Daily Loads (TMDL) Other Than Chesapeake Bay)	Section I B	24 months after permit coverage
Chesapeake Bay TMDL Action Plan – (Special Condition for Chesapeake Bay TMDL)	Section I C	
Stormwater Management Progressive Compliance and Enforcement – (Minimum Control Measure 4 - Construction Site Stormwater Runoff Control)	Section II B 5	
Daily Good Housekeeping Procedures (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6 a	
Other TMDL Action Plans for applicable TMDLs approved between July 2008 and June 2013 - (Special Conditions for Approved Total Maximum Daily Loads (TMDL) Other Than Chesapeake Bay)	Section I B	36 months after permit coverage
Outfall Map Completed - (Minimum Control Measure 3 – Illicit Discharge Detection and Elimination) – Applicable to new boundaries identified as “urbanized” areas in the 2010 Decennial Census	Section II B 3 a (3)	48 months after permit coverage
SWPPP Implementation - (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6 b (3)	
NMP Implementation - (Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping for Municipal Operations)	Section II B 6 c (1) (b)	60 months after permit coverage
*Updates should be submitted with the appropriate annual report.		

SECTION I

DISCHARGE AUTHORIZATION AND SPECIAL CONDITIONS

A. Coverage under this state permit. During the period beginning with the date of coverage under this general permit and lasting until the expiration and reissuance of this state permit, the operator is authorized to discharge in accordance with this state permit from the small municipal separate storm sewer system identified in the registration statement into surface waters within the boundaries of the Commonwealth of Virginia and consistent with 4VAC50-60-1230.

B. Special conditions for approved total maximum daily loads (TMDL) other than the Chesapeake Bay TMDL. An approved TMDL may allocate an applicable wasteload to a small MS4 that identifies a pollutant or pollutants for which additional stormwater controls are necessary for the surface waters to meet water quality standards. The MS4 operator shall address the pollutants in accordance with this special condition where the MS4 has been allocated a wasteload in an approved TMDL.

1. The operator shall maintain an updated MS4 Program Plan that includes a specific TMDL Action Plan for pollutants allocated to the MS4 in approved TMDLs. TMDL Action Plans may be implemented in multiple phases over more than one state permit cycle using the adaptive iterative approach provided adequate progress to reduce the pollutant discharge in a manner consistent with the assumptions and requirements of the specific TMDL wasteload is demonstrated in accordance with subdivision 2 e of this subsection These TMDL Actions Plans shall identify the best management practices and other interim milestone activities to be implemented during the remaining terms of this state permit.

a. In accordance with Table 1 in this section, the operator shall update the MS4 Program Plans to address any new or modified requirements established under this special condition for pollutants identified in TMDL wasteload allocations approved prior to July 9, 2008.

b. In accordance with Table 1 in this section, the operator shall update the MS4 Program Plan to incorporate approvable TMDL Action Plans that identify the best management practices and other interim milestone activities that will be implemented during the remaining term of this permit for pollutants identified in TMDL wasteload allocations approved either on or after July 9, 2008, and prior to issuance of this permit.

c. Unless specifically denied in writing by the department, TMDL Action Plans and updates developed in accordance with this section become effective and enforceable 90 days after the date received by the department.

2. The operator shall:

a. Develop and maintain a list of its legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements applicable to reducing the pollutant identified in each applicable WLA;

b. Identify and maintain an updated list of all additional management practices, control techniques and system design and engineering methods, beyond those identified in Section II B, that have been implemented as part of the MS4 Program Plan that are applicable to reducing the pollutant identified in the WLA;

c. Enhance its public education and outreach and employee training programs to also promote methods to eliminate and reduce discharges of the pollutants identified in the WLA;

d. Assess all significant sources of pollutant(s) from facilities of concern owned or operated by the MS4 operator that are not covered under a separate VPDES permit and identify all municipal facilities that may be a significant source of the identified pollutant. For the purposes of this assessment, 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. (For example, a significant source of pollutant from a facility of concern for a bacteria TMDL would be expected to be greater at a dog park than at other recreational facilities where dogs are prohibited);

e. Develop and implement a method to assess TMDL Action Plans for their effectiveness in reducing the pollutants identified in the WLAs. The evaluation shall use any newly available

information, representative and adequate water quality monitoring results, or modeling tools to estimate pollutant reductions for the pollutant or pollutants of concern from implementation of the MS4 Program Plan. Monitoring may include BMP, outfall, or in-stream monitoring, as appropriate, to estimate pollutant reductions. The operator may conduct monitoring, utilize existing data, establish partnerships, or collaborate with other MS4 operators or other third parties, as appropriate. This evaluation shall include assessment of the facilities identified in subdivision 2 d of this subsection. The methodology used for assessment shall be described in the TMDL Action Plan.

3. Analytical methods for any monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the Environmental Protection Agency (EPA). Where an approved method does not exist, the operator must use a method consistent with the TMDL.

4. The operator is encouraged to participate as a stakeholder in the development of any TMDL implementation plans applicable to their discharge. The operator may incorporate applicable best management practices identified in the TMDL implementation plan in the MS4 Program Plan or may choose to implement BMPs of equivalent design and efficiency provided that the rationale for any substituted BMP is provided and the substituted BMP is consistent with the assumptions and requirements of the TMDL WLA.

5. Annual reporting requirements.

a. The operator shall submit the required TMDL Action Plans with the appropriate annual report and in accordance with the associated schedule identified in this state permit.

b. On an annual basis, the operator shall report on the implementation of the TMDL Action Plans and associated evaluation including the results of any monitoring conducted as part of the evaluation.

6. The operator shall identify the best management practices and other steps that will be implemented during the next state permit term as part of the operator's reapplication for coverage as required under Section III M.

7. For planning purposes, the operator shall include an estimated end date for achieving the applicable wasteload allocations as part of its reapplication package due in accordance with Section III M.

C. Special condition for the Chesapeake Bay TMDL. The Commonwealth in its Phase I and Phase II Chesapeake Bay TMDL Watershed Implementation Plans (WIP) committed to a phased approach for MS4s, affording MS4 operators up to three full five-year permit cycles to implement necessary reductions. This permit is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of 5.0% of L2 as specified in the 2010 Phase I WIP. Conditions of future permits will be consistent with the TMDL or WIP conditions in place at the time of permit issuance.

1. Definitions. The following definitions apply to this state permit for the purpose of the special condition for discharges in the Chesapeake Bay Watershed:

"Existing sources" means pervious and impervious urban land uses served by the MS4 as of June 30, 2009.

"New sources" means pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009.

"Pollutants of concern" or "POC" means total nitrogen, total phosphorus, and total suspended solids.

"Transitional sources" means regulated land disturbing activities that are temporary in nature and discharge through the MS4.

2. Chesapeake Bay TMDL planning.

a. In accordance with Table 1 in this section, the operator shall develop and submit to the department for its review and acceptance an approvable Chesapeake Bay TMDL Action Plan. Unless specifically denied in writing by the department, this plan becomes effective and enforceable 90 days after the date received by the department. The plan shall include:
(1) A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition;
(2) The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition;
(3) The means and methods that will be utilized to address discharges into the MS4 from new sources;
(4) An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables 2 a-d in this section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate:

Table 2a: Calculation Sheet for Estimating Existing Source Loads for the James River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	2009 EOS Loading Rate (lbs/ acre)	Estimated Total POC Load Based on 2009 Progress Run
Regulated Urban Impervious	Nitrogen		9.39	
Regulated Urban Pervious			6.99	
Regulated Urban Impervious	Phosphorus		1.76	
Regulated Urban Pervious			0.5	
Regulated Urban Impervious	Total Suspended Solids		676.94	
Regulated Urban Pervious			101.08	

Table 2b: Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2				
Subsource	**Pollutant**	**Total Existing Acres Served by MS4 (6/30/09)**	**2009 EOS Loading Rate (lbs/ acre)**	**Estimated Total POC Load Based on 2009 Progress Run**
Regulated Urban Impervious	Nitrogen		16.86	
Regulated Urban Pervious			10.07	
Regulated Urban Impervious	Phosphorus		1.62	
Regulated Urban Pervious			0.41	
Regulated Urban Impervious	Total Suspended Solids		1,171.32	
Regulated Urban Pervious			175.8	

Table 2c: Calculation Sheet for Estimating Existing Source Loads for the Rappahannock River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2				
Subsource	**Pollutant**	**Total Existing Acres Served by MS4 (6/30/09)**	**2009 EOS Loading Rate (lbs/ acre)**	**Estimated Total POC Load Based on 2009 Progress Run**
Regulated Urban Impervious	Nitrogen		9.38	
Regulated Urban Pervious			5.34	
Regulated Urban Impervious	Phosphorus		1.41	
Regulated Urban Pervious			0.38	
Regulated Urban Impervious	Total Suspended Solids		423.97	
Regulated Urban Pervious			56.01	

Table 2d: Calculation Sheet for Estimating Existing Source Loads for the York River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2				
Subsource	**Pollutant**	**Total Existing Acres Served by MS4 (6/30/09)**	**2009 EOS Loading Rate (lbs/ acre)**	**Estimated Total POC Load Based on 2009 Progress Run**
Regulated Urban Impervious	Nitrogen		7.31	
Regulated Urban Pervious			7.65	
Regulated Urban Impervious	Phosphorus		1.51	
Regulated Urban Pervious			0.51	
Regulated Urban Impervious	Total Suspended Solids		456.68	
Regulated Urban Pervious			72.78	

(5) A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables 3 a-d in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.

Table 3a: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for the James River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2				
Subsource	**Pollutant**	**Total Existing Acres Served by MS4 (6/30/09)**	**First Permit Cycle Required Reduction in Loading Rate (lbs/ acre)**	**Total Reduction Required First Permit Cycle (lbs)**
Regulated Urban Impervious	Nitrogen		0.04	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		6.67	
Regulated Urban Pervious			0.44	

Table 3b: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for the Potomac River Basin *Based on Chesapeake Bay Program Watershed Model Phase 5.3.2				
Subsource	**Pollutant**	**Total Existing Acres Served by MS4 (6/30/09)**	**First Permit Cycle Required Reduction in Loading Rate (lbs/ acre)**	**Total Reduction Required First Permit Cycle (lbs)**
Regulated Urban Impervious	Nitrogen		0.08	
Regulated Urban Pervious			0.03	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.001	
Regulated Urban Impervious	Total Suspended Solids		11.71	
Regulated Urban Pervious			0.77	

Table 3c: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for the Rappahannock River Basin
***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	Total Reduction Required First Permit Cycle (lbs)
Regulated Urban Impervious	Nitrogen		0.04	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		4.24	
Regulated Urban Pervious			0.25	

Table 3d: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for the York River Basin
***Based on Chesapeake Bay Program Watershed Model Phase 5.3.2**

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre)	Total Reduction Required First Permit Cycle (lbs)
Regulated Urban Impervious	Nitrogen		0.03	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		4.60	
Regulated Urban Pervious			0.32	

(6) The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions;
(7) The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.
(8) The means and methods to offset the increased loads from projects as grandfathered in accordance with 4VAC50-60-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids.
(9) The operator shall address any modification to the TMDL or watershed implementation plan that occurs during the term of this state permit as part of its permit reapplication and not during the term of this state permit.

Table 4: Ratio of Phosphorus Loading Rate to Nitrogen and Total Suspended Solids Loading Rates for Chesapeake Bay Basins

Ratio of Phosphorus to Other POCs (Based on All Land Uses 2009 Progress Run)	Phosphorus Loading Rate (lbs/acre)	Nitrogen Loading Rate (lbs/acre)	Total Suspended Solids Loading Rate (lbs/acre)
James River Basin	1.0	5.2	420.9
Potomac River Basin	1.0	6.9	469.2
Rappahannock River Basin	1.0	6.7	320.9
York River Basin	1.0	9.5	531.6

(10) A list of future projects and associated acreage that qualify as grandfathered in accordance with 4VAC50-60-48;
(11) An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle; and
(12) An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.
b. As part of development of the Chesapeake Bay TMDL Action Plan, the operator may consider:
(1) Implementation of BMPs on unregulated lands provided any necessary baseline reduction is not included toward meeting the required reduction in this permit;
(2) Utilization of stream restoration projects, provided that the credit applied to the required POC load reduction is prorated based on the ratio of regulated urban acres to total drainage acres upstream of the restored area;
(3) Establishment of a memorandum of understanding (MOU) with other MS4 operators that discharge to the same or adjacent eight digit hydrologic unit within the same basin to implement BMPs collectively. The MOU shall include a mechanism for dividing the POC reductions created by BMP implementation between the cooperative MS4s;
(4) Utilization of any pollutant trading or offset program in accordance with § 10.1-603.15:1 et seq. of the Code of Virginia, governing trading and offsetting;

(5) A more stringent average land cover condition based on less than 16% impervious cover for new sources initiating construction between July 1, 2009, and June 30, 2014, and all grandfathered projects where allowed by law; and

(6) Any BMPs installed after June 30, 2009, as part of a retrofit program may be applied towards meeting the required load reductions provided any necessary baseline reductions are not included.

3. Chesapeake Bay TMDL Action Plan implementation. The operator shall implement the TMDL Action Plan according to the schedule therein. Compliance with this requirement represents adequate progress for this state permit term towards achieving TMDL wasteload allocations consistent with the assumptions and requirements of the TMDL. For the purposes of this permit, the implementation of the following represents implementation to the maximum extent practicable and demonstrates adequate progress:

a. Implementation of nutrient management plans in accordance with the schedule identified in the minimum control measure in Section II related to pollution prevention/good housekeeping for municipal operations;

b. Implementation of the minimum control measure in Section II related to construction site stormwater runoff control in accordance with this state permit shall address discharges from transitional sources;

c. Implementation of the means and methods to address discharges from new sources in accordance with the minimum control measure in Section II related to post-construction stormwater management in new development and development of prior developed lands and in order to offset 5.0% of the total increase in POC loads between July 1, 2009, and June 30, 2014. Increases in the POC load from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project; and

d. Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources in accordance with the Chesapeake Bay TMDL Action Plan.

4. Annual reporting requirements.

a. In accordance with Table 1 in this section, the operator shall submit the Chesapeake Bay Action Plan with the appropriate annual report.

b. Each subsequent annual report shall include a list of control measures implemented during the reporting period and the cumulative progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.

c. Each subsequent annual report shall include a list of control measures, in an electronic format provided by the department , that were implemented during the reporting cycle and the estimated reduction achieved by the control. For stormwater management controls, the report shall include the information required in Section II B 5 e and shall include whether an existing stormwater management control was retrofitted, and if so, the existing stormwater management control type retrofit used.

d. Each annual report shall include a list of control measures that are expected to be implemented during the next reporting period and the expected progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.

5. The operator shall include the following as part of its reapplication package due in accordance with Section III M:

a. Documentation that sufficient control measures have been implemented to meet the compliance target identified in this special condition. If temporary credits or offsets have been purchased in order to meet the compliance target, the list of temporary reductions utilized to meet the required reduction in this state permit and a schedule of implementation to ensure the permanent reduction must be provided; and

b. A draft second phase Chesapeake Bay TMDL Action Plan designed to reduce the existing pollutant load as follows:

(1) The existing pollutant of concern loads by an additional seven times the required reductions in loading rates using the applicable Table 3 for sources included in the 2000 U.S. Census Bureau urbanized areas;

(2) The existing pollutant of concerns loads by an additional eight times the required reductions in loading rates using the applicable Table 3 for expanded sources identified in the U.S. Census Bureau 2010 urbanized areas;
(3) An additional 35% reduction in new sources developed between 2009 and 2014 and for which the land use cover condition was greater than 16%; and
(4) Accounts for any modifications to the applicable loading rate provided to the operator as a result of TMDL modification.

SECTION II

MUNICIPAL SEPARATE STORM SEWER SYSTEM MANAGEMENT PROGRAM

A. The operator of a small MS4 must develop, implement, and enforce a MS4 Program designed to reduce the discharge of pollutants from the small MS4 to the maximum extent practicable (MEP), to protect water quality, to ensure compliance by the operator with water quality standards, and to satisfy the appropriate water quality requirements of the Clean Water Act and its attendant regulations. The MS4 Program must include the minimum control measures described in paragraph B of this section. Implementation of best management practices consistent with the provisions of an iterative MS4 Program required pursuant to this section constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable", protects water quality in the absence of a TMDL wasteload allocation, ensures compliance by the operator with water quality standards, and satisfies the appropriate water quality requirements of the Clean Water Act and regulations in the absence of a TMDL WLA. The requirements of this section and those special conditions set out in Section I B also apply where a WLA is applicable.

B. Minimum control measures.

NOTE regarding minimum control measures for public education and outreach on stormwater impacts and public involvement/participation: "Public" is not defined in this permit. However, the department concurs with the following EPA statement, which was published in the Federal Register, Volume 64, No. 235, page 68,750 on December 8, 1999, regarding "public" and its applicability to MS4 programs: "EPA acknowledges that federal and state facilities are different from municipalities. EPA believes, however, that the minimum measures are flexible enough that they can be implemented by these facilities. As an example, DOD commentators asked about how to interpret the term "public" for military installations when implementing the public education measure. EPA agrees with the suggested interpretation of "public" for DOD facilities as "the resident and employee population within the fence line of the facility." The department recommends that nontraditional MS4 operators, such as state and federal entities and local school districts, utilize this statement as guidance when determining their applicable "public" for compliance with this permit.

1. Public education and outreach on stormwater impacts.

a. The operator shall continue to implement the public education and outreach program as included in the registration statement until the program is updated to meet the conditions of this state permit. Operators who have not previously held MS4 permit coverage shall implement this program in accordance with the schedule provided with the completed registration statement.

b. The public education and outreach program should be designed 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; and

(3) Implementing a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.

c. The updated program shall be designed to:
(1) Identify, at a minimum, three high-priority water quality issues, that contribute to the discharge of stormwater (e.g., Chesapeake Bay nutrients, pet wastes and local bacteria TMDLs, high-quality receiving waters, and illicit discharges from commercial sites) and a rationale for the selection of the three high-priority water quality issues;
(2) Identify and estimate the population size of the target audience or audiences who is most likely to have significant impacts for each high-priority water quality issue;
(3) Develop relevant message or messages and associated educational and outreach materials (e.g., various media such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, websites, and social media) for message distribution to the selected target audiences while considering the viewpoints and concerns of the target audiences including minorities, disadvantaged audiences, and minors;
(4) Provide for public participation during public education and outreach program development;
(5) Annually conduct sufficient education and outreach activities designed to reach an equivalent 20% of each high-priority issue target audience. It shall not be considered noncompliance for failure to reach 20% of the target audience. However, it shall be a compliance issue if insufficient effort is made to annually reach a minimum of 20% of the target audience; and
(6) 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.

d. The operator may coordinate their public education and outreach efforts with other MS4 operators; however, each operator shall be individually responsible for meeting all of its state permit requirements.

e. Prior to application for continued state permit coverage required in Section III M, the operator shall evaluate the education and outreach program for:
(1) Appropriateness of the high-priority stormwater issues;
(2) Appropriateness of the selected target audiences for each high-priority stormwater issue;
(3) Effectiveness of the message or messages being delivered; and
(4) Effectiveness of the mechanism or mechanisms of delivery employed in reaching the target audiences.

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

g. The operator shall include the following information in each annual report submitted to the department during this permit term:
(1) A list of the education and outreach activities conducted during the reporting period for each high-priority water quality issue, the estimated number of people reached, and an estimated percentage of the target audience or audiences that will be reached; and
(2) A list of the 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 an estimated percentage of the target audience or audiences that will be reached.

2. Public involvement/participation.

a. Public involvement.
(1) The operator shall comply with any applicable federal, state, and local public notice requirements.
(2) The operator shall:
(a) Maintain an updated MS4 Program Plan. Any required updates to the MS4 Program Plan shall be completed at a minimum of once a year and shall be updated in conjunction with the annual report. The operator shall post copies of each MS4 program plan on its webpage at a minimum of once a year and within 30 days of submittal of the annual report to the department.
(b) Post copies of each annual report on the operator's web page within 30 days of submittal to the department and retain copies of annual reports online for the duration of this state permit; and
(c) Prior to applying for coverage as required by Section III M, notify the public and provide for receipt of comment of the proposed MS4 Program Plan that will be submitted with the registration statement. As part of the reapplication, the operator shall address how it considered the comments received in the development of its MS4 Program Plan. The operator shall give public notice by a method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other forum or medium to solicit public participation.

b. Public participation. The operator shall participate, through promotion, sponsorship, or other involvement, in a minimum of four local activities annually e.g., stream cleanups; hazardous waste cleanup days; and meetings with watershed associations, environmental advisory committees, and other environmental organizations that operate within proximity to the operator's small MS4. The activities shall be aimed at increasing 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.

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

d. Each annual report shall include:
(1) A web link to the MS4 Program Plan and annual report; and
(2) Documentation of compliance with the public participation requirements of this section.

3. Illicit discharge detection and elimination.

a. The operator shall maintain an accurate storm sewer system map and information table and shall update it in accordance with the schedule set out in Table 1 of this section.
(1) The storm sewer system map must show the following, at a minimum:
(a) 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
(b) The name and location of all waters receiving discharges from the MS4 outfalls and the associated HUC.
(2) The associated information table shall include for each outfall the following:
(a) The unique identifier;
(b) The estimated MS4 acreage served;
(c) 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
(d) The name of any applicable TMDL or TMDLs.
(3) Within 48 months of coverage under this state permit, the operator shall have a complete and updated storm sewer system map and information table that includes all MS4 outfalls

located within the boundaries identified as "urbanized" areas in the 2010 Decennial Census and shall submit the updated information table as an appendix to the annual report.
(4) The operator shall maintain a copy of the current storm sewer system map and outfall information table for review upon request by the public or by the department.
(5) The operator shall continue to identify other points of discharge. The operator shall notify in writing the downstream MS4 of any known physical interconnection.

b. The operator shall effectively prohibit, through ordinance or other legal mechanism, nonstormwater discharges into the storm sewer system to the extent allowable under federal, state, or local law, regulation, or ordinance. Categories of nonstormwater discharges or flows (i.e., illicit discharges) identified in 4VAC50-60-400 D 2 c (3) must be addressed only if they are identified by the operator as significant contributors of pollutants to the small MS4. Flows that have been identified in writing by the Department of Environmental Quality as de minimis discharges are not significant sources of pollutants to surface water and do not require a VPDES permit.

c. The operator shall develop, implement, and update, when appropriate, written procedures to detect, identify, and address unauthorized nonstormwater discharges, including illegal dumping, to the small MS4. These procedures shall include:
(1) Written dry weather field screening methodologies to detect and eliminate illicit discharges to the MS4 that include field observations and field screening monitoring and that provide:
(a) A prioritized schedule of field screening activities determined by the operator based on such criteria as age of the infrastructure, land use, historical illegal discharges, dumping or cross connections.
(b) The minimum number of field screening activities the operator shall complete annually to be determined as follows: (i) if the total number of outfalls in the small MS4 is less than 50, all outfalls shall be screened annually or (ii) if the small MS4 has 50 or more total outfalls, a minimum of 50 outfalls shall be screened annually.
(c) Methodologies to collect the general information such as time since the last rain, the quantity of the last rain, site descriptions (e.g., conveyance type and dominant watershed land uses), estimated discharge rate (e.g., width of water surface, approximate depth of water, approximate flow velocity, and flow rate), and visual observations (e.g., order, color, clarity, floatables, deposits or stains, vegetation condition, structural condition, and biology);
(d) A time frame upon which to conduct an investigation or investigations to identify and locate the source of any observed continuous or intermittent nonstormwater discharge prioritized as follows: (i) illicit discharges suspected of being sanitary sewage or significantly contaminated must be investigated first and (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 sewage 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.
(e) Methodologies to determine the source of all illicit discharges shall be conducted. If an illicit discharge is found, but within six months of the beginning of the investigation neither the source nor the same nonstormwater discharge has been identified, then the operator shall document such in accordance with Section II B 3 f. If the observed discharge is intermittent, the operator must document that a minimum of three separate investigations were made in an attempt to observe the discharge when it was flowing. If these attempts are unsuccessful, the operator shall document such in accordance with Section II B 3 f.
(f) Mechanisms to eliminate identified sources of illicit discharges including a description of the policies and procedures for when and how to use legal authorities;
(g) Methods for conducting a follow-up investigation in order to verify that the discharge has been eliminated.
(h) A mechanism to track all investigations to document: (i) the date or dates that the illicit discharge was observed and reported; (ii) the results of the investigation; (iii) any follow-up to the investigation; (iv) resolution of the investigation; and (v) the date that the investigation was closed.

d. The operator shall promote, publicize, and facilitate public reporting of illicit discharges into or from MS4s. The operator shall conduct inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented by the responsible party.

e. The MS4 Program Plan shall include all procedures developed by the operator to detect, identify, and address nonstormwater discharges to the MS4 in accordance with the schedule in Table 1 in this section. In the interim, the operator shall continue to implement the program as included as part of the registration statement until the program is updated to meet the conditions of this permit. Operators, who have not previously held MS4 permit coverage, shall implement this program in accordance with the schedule provided with the completed registration statement.

f. Annual reporting requirements. Each annual report shall include:
(1) A list of any written notifications of physical interconnection given by the operator to other MS4s;
(2) 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; and
(3) 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.

4. Construction site stormwater runoff control.

a. Applicable oversight requirements. The operator shall utilize its legal authority, such as ordinances, permits, orders, specific contract language, and interjurisdictional agreements, to address discharges entering the MS4 from the following land-disturbing activities:
(1) Land-disturbing activities as defined in § 10.1-560 of the Code of Virginia that result in the disturbance of 10,000 square feet or greater;
(2) Land-disturbing activities in Tidewater jurisdictions, as defined in § 10.1-2101 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;
(3) Land-disturbing activities disturbing less than the minimum land disturbance identified in subdivision (1) or (2) above for which a local ordinance requires that an erosion and sediment control plan be developed; and
(4) Land-disturbing activities on individual residential lots or sections of residential developments being developed by different property owners and where the total land disturbance of the residential development is 10,000 square feet or greater. The operator may utilize an agreement in lieu of a plan as provided in § 10.1-563 of the Code of Virginia for this category of land disturbances.

b. Required plan approval prior to commencement of the land disturbing activity. The operator shall require that land disturbance not begin until an erosion and sediment control plan or an agreement in lieu of a plan as provided in § 10.1-563 is approved by a VESCP authority in accordance with the Erosion and Sediment Control Act (§ 10.1-560 et seq.). The plan shall be:
(1) Compliant with the minimum standards identified in 4VAC-50-30-40 of the Erosion and Sediment Control Regulations; or
(2) Compliant with department-approved annual standards and specifications. Where applicable, the plan shall be consistent with any additional or more stringent, or both, erosion and sediment control requirements established by state regulation or local ordinance.

c. Compliance and enforcement.
(1) The operator shall inspect land-disturbing activities for compliance with an approved erosion and sediment control plan or agreement in lieu of a plan in accordance with the minimum standards identified in 4VAC50-30-40 or with department-approved annual standards and specifications.
(2) The operator shall implement an inspection schedule for land-disturbing activities identified in Section II B 4 a as follows:
(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.
Where an operator establishes an alternative inspection program as provided for in 4VAC50-30-60 B 2, the written schedule shall be implemented in lieu of Section II B 4 c (2) and the written plan shall be included in the MS4 Program Plan.
(3) Operator inspections shall be conducted by personnel who hold a certificate of competence in accordance with 4VAC-50-50-40. Documentation of certification shall be made available upon request by the VESCP authority or other regulatory agency.
(4) The operator shall promote to the public a mechanism for receipt of complaints regarding regulated land-disturbing activities and shall follow up on any complaints regarding potential water quality and compliance issues.
(5) The operator shall utilize its legal authority to require compliance with the approved plan where an inspection finds that the approved plan is not being properly implemented.
(6) The operator shall utilize, as appropriate, its legal authority to require changes to an approved plan when a inspection finds that the approved plan is inadequate to effectively control soil erosion, sediment deposition, and runoff to prevent the unreasonable degradation of properties, stream channels, waters, and other natural resources.
(7) The operator shall require implementation of appropriate controls to prevent nonstormwater discharges to the MS4, such as wastewater, concrete washout, fuels and oils, and other illicit discharges identified during land-disturbing activity inspections of the MS4. The discharge of nonstormwater discharges other than those identified in 4VAC50-60-1220 through the MS4 is not authorized by this state permit.
(8) The operator may develop and implement a progressive compliance and enforcement strategy provided that such strategy is included in the MS4 Program Plan and is consistent with 4VAC50-30.

d. Regulatory coordination. The operator shall implement enforceable procedures to require that large construction activities as defined in 4VAC50-60-10 and small construction activities as defined in 4VAC50-60-10, including municipal construction activities, secure necessary state permit authorizations from the department to discharge stormwater.

e. MS4 Program requirements. The operator's MS4 Program Plan shall include:
(1) A description of the legal authorities utilized to ensure compliance with the minimum control measure in Section II related to construction site stormwater runoff control such as ordinances, permits, orders, specific contract language, and interjurisdictional agreements;
(2) Written plan review procedures and all associated documents utilized in plan review;
(3) For the MS4 operators who obtain department-approved standards and specifications, a copy of the current standards and specifications;
(4) Written inspection procedures and all associated documents utilized during inspection including the inspection schedule;
(5) Written procedures for compliance and enforcement, including a progressive compliance and enforcement strategy, where appropriate; and
(6) The roles and responsibilities of each of the operator's departments, divisions, or subdivisions in implementing the minimum control measure in Section II related to construction site stormwater runoff control. If the operator utilizes another entity to implement portions of the MS4 Program Plan, a copy of the written agreement must be retained in the

MS4 Program Plan. The description of each party's roles and responsibilities, including any written agreements with third parties, shall be updated as necessary.
Reference may be made to any listed requirements in this subdivision provided the location of where the reference material can be found is included and the reference material is made available to the public upon request.

f. Reporting requirements. The operator shall track regulated land-disturbing activities and submit the following information in all annual reports:
(1) Total number of regulated land-disturbing activities;
(2) Total number of acres disturbed;
(3) Total number of inspections conducted; and
(4) A summary of the enforcement actions taken, including the total number and type of enforcement actions taken during the reporting period.

5. Post-construction stormwater management in new development and development on prior developed lands.

a. Applicable oversight requirements. The operator shall address post-construction stormwater runoff that enters the MS4 from the following land-disturbing activities:
(1) New development and development on prior developed lands that are defined as large construction activities or small construction activities in 4VAC50-60-10;
(2) New development and development on prior developed lands that disturb greater than or equal to 2,500 square feet, but less than one acre, located in a Chesapeake Bay Preservation Area designated by a local government located in Tidewater, Virginia, as defined in § 10.1-2101 of the Code of Virginia; and
(3) New development and development on prior developed lands where an applicable state regulation or local ordinance has designated a more stringent regulatory size threshold than that identified in subdivision (1) or (2) above.

b. Required design criteria for stormwater runoff controls. The operator shall utilize legal authority, such as ordinances, permits, orders, specific contract language, and interjurisdictional agreements, to require that activities identified in Section II B 5 a address stormwater runoff in such a manner that stormwater runoff controls are designed and installed:
(1) In accordance with the appropriate water quality and water quantity design criteria as required in Part II (4VAC50-60-40 et seq.) of 4VAC50-60;
(2) In accordance with any additional applicable state or local design criteria required at project initiation; and
(3) Where applicable, in accordance with any department-approved annual standards and specifications.
Upon board approval of a Virginia Stormwater Management Program authority (VSMP Authority) as defined in § 10.1-603.2 of the Code of Virginia and reissuance of the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Construction Activities, the operator shall require that stormwater management plans are approved by the appropriate VSMP Authority prior to land disturbance. In accordance with § 10.1-603.3 M of the Code of Virginia, VSMPs shall become effective July 1, 2014, unless otherwise specified by state law or by the board.

c. Inspection, operation, and maintenance verification of stormwater management facilities.
(1) For stormwater management facilities not owned by the MS4 operator, the following conditions apply:
(a) The operator shall require adequate long-term operation and maintenance by the owner of the stormwater management facility by requiring the owner to develop a recorded inspection schedule and maintenance agreement to the extent allowable under state or local law or other legal mechanism;

(b) The operator or his designee shall implement a schedule designed to inspect all privately owned stormwater management facilities that discharge into the MS4 at least once every five years to document that maintenance is being conducted in such a manner to ensure long-term operation in accordance with the approved designs.
(c) The operator shall utilize its legal authority for enforcement of maintenance responsibilities if maintenance is neglected by the owner. The operator may develop and implement a progressive compliance and enforcement strategy provided that the strategy is included in the MS4 Program Plan.
(d) Beginning with the issuance of this state permit, the operator may utilize strategies other than maintenance agreements such as periodic inspections, homeowner outreach and education, and other methods targeted at promoting the long-term maintenance of stormwater control measures that are designed to treat stormwater runoff solely from the individual residential lot. Within 12 months of coverage under this permit, the operator shall develop and implement these alternative strategies and include them in the MS4 Program Plan.
(2) For stormwater management facilities owned by the MS4 operator, the following conditions apply:
(a) The operator shall provide for adequate long-term operation and maintenance of its stormwater management facilities in accordance with written inspection and maintenance procedures included in the MS4 Program Plan.
(b) The operator shall inspect these stormwater management facilities annually. The operator may choose to implement an alternative schedule to inspect these stormwater management facilities based on facility type and expected maintenance needs provided that the alternative schedule is included in the MS4 Program Plan.
(c) The operator shall conduct maintenance on its stormwater management facilities as necessary.

d. MS4 Program Plan requirements. The operator's MS4 Program Plan shall be updated in accordance with Table 1 in this section to include:
(1) A list of the applicable legal authorities such as ordinance, state and other permits, orders, specific contract language, and interjurisdictional agreements to ensure compliance with the minimum control measure in Section II related to post-construction stormwater management in new development and development on prior developed lands;
(2) Written policies and procedures utilized to ensure that stormwater management facilities are designed and installed in accordance with Section II B 5 b;
(3) Written inspection policies and procedures utilized in conducting inspections;
(4) 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;
(5) Written procedures for inspection and maintenance of operator-owned stormwater management facilities;
(6) The roles and responsibilities of each of the operator's departments, divisions, or subdivisions in implementing the minimum control measure in Section II related to post-construction stormwater management in new development and development on prior developed lands. If the operator utilizes another entity to implement portions of the MS4 Program Plan, a copy of the written agreement must be retained in the MS4 Program Plan. Roles and responsibilities shall be updated as necessary.

e. Stormwater management facility tracking and reporting requirements. The operator 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 the following:
(1) The stormwater management facility type;
(2) A general description of the facility's location, including the address or latitude and longitude;

(3) The acres treated by the facility, including total acres, as well as the breakdown of pervious and impervious acres;
(4) The date the facility was brought online (MM/YYYY). If the date is not known, the operator shall use June 30, 2005, as the date brought online for all previously existing stormwater management facilities;
(5) The sixth order hydrologic unit code (HUC) in which the stormwater management facility is located;
(6) 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;
(7) Whether the stormwater management facility is operator-owned or privately-owned;
(8) Whether a maintenance agreement exists if the stormwater management facility is privately owned; and
(9) The date of the operator's most recent inspection of the stormwater management facility.
In addition, the operator shall annually track and report the total number of inspections completed and, when applicable, the number of enforcement actions taken to ensure long-term maintenance.

The operator shall submit an electronic database or spreadsheet of all stormwater management facilities brought online during each reporting year with the appropriate annual report. Upon such time as the department provides the operators access to a statewide web-based reporting electronic database or spreadsheet, the operator shall utilize such database to complete the pertinent reporting requirements of this state permit.

6. Pollution prevention/good housekeeping for municipal operations.

a. Operations and maintenance activities. The MS4 Program Plan submitted with the registration statement shall be implemented by the operator until updated in accordance with this state permit. In accordance with Table 1 in this section, the operator shall develop and implement written procedures designed to minimize or prevent pollutant discharge from: (i) daily operations such as road, street, and parking lot maintenance; (ii) equipment maintenance; and (iii) the application, storage, transport, and disposal of pesticides, herbicides, and fertilizers. The written procedures shall be utilized as part of the employee training. At a minimum, the written procedures shall be designed to:
(1) Prevent illicit discharges;
(2) Ensure the proper disposal of waste materials, including landscape wastes;
(3) Prevent the discharge of municipal vehicle wash water into the MS4 without authorization under a separate VPDES permit;
(4) Prevent the discharge of wastewater into the MS4 without authorization under a separate VPDES permit;
(5) Require implementation of best management practices when discharging water pumped from utility construction and maintenance activities;
(6) Minimize the pollutants in stormwater runoff from bulk storage areas (e.g., salt storage, topsoil stockpiles) through the use of best management practices;
(7) Prevent pollutant discharge into the MS4 from leaking municipal automobiles and equipment; and
(8) Ensure that the application of materials, including fertilizers and pesticides, is conducted in accordance with the manufacturer's recommendations.

b. Municipal facility pollution prevention and good housekeeping.
(1) Within 12 months of state permit coverage, the operator shall identify all municipal high-priority facilities. These high-priority facilities shall include (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.

(2) Within 12 months of state permit coverage, the operator shall identify which of the municipal high-priority facilities have a high potential of discharging pollutants. Municipal high-priority facilities that have a high potential for discharging pollutants are those facilities identified in subsection (1) above that are not covered under a separate VPDES permit and which any of the following materials or activities occur and are expected to have exposure to stormwater resulting from rain, snow, snowmelt or runoff:
(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.
(3) The operator shall develop and implement specific stormwater pollution prevention plans for all high-priority facilities identified in subdivision 2 of this subsection. The operator shall complete SWPPP development and implementation shall be completed within 48 months of coverage under this state permit. Facilities covered under a separate VDPES permit shall adhere to the conditions established in that permit and are excluded from this requirement.
(4) Each SWPPP shall include:
(a) A site description that includes a site map identifying all outfalls, direction of flows, existing source controls, and receiving water bodies;
(b) A discussion and checklist of potential pollutants and pollutant sources;
(c) A discussion of all potential nonstormwater discharges;
(d) Written procedures designed to reduce and prevent pollutant discharge;
(e) A description of the applicable training as required in Section II B 6 d;
(f) Procedures to conduct an annual comprehensive site compliance evaluation;
(g) An inspection and maintenance schedule for site specific source controls. The date of each inspection and associated findings and follow-up shall be logged in each SWPPP;
(h) The contents of each SWPPP shall be evaluated and modified as necessary to accurately reflect any discharge, release, or spill from the high priority facility reported in accordance with Section III G. For each such discharge, release, or spill, the SWPPP must include the following information: date of incident; material discharged, released, or spilled; and quantity discharged, released or spilled; and
(i) A copy of each SWPPP shall be kept at each facility and shall be kept updated and utilized as part of staff training required in Section II B 6 d.

c. Turf and Landscape management.
(1) The operator shall implement turf and landscape nutrient management plans that have been developed by a certified turf and landscape nutrient management planner in accordance with § 10.1-104.2 of the Code of Virginia on all lands owned or operated by the MS4 operator where nutrients are applied to a contiguous area greater than one acre. Implementation shall be in accordance with the following schedule:
(a) Within 12 months of state permit coverage, the operator shall identify all applicable lands where nutrients are applied to a contiguous area of more than one acre. A latitude and longitude shall be provided for each such piece of land and reported in the annual report.
(b) Within 60 months of state permit coverage, the operator shall implement turf and landscape nutrient management plans on all lands where nutrients are applied to a

contiguous area of more than one acre. The following measurable outcomes are established for the implementation of turf and landscape nutrient management plans: (i) within 24 months of permit coverage, not less than 15% of all identified acres will be covered by turf and landscape nutrient management plans; (ii) within 36 months of permit coverage, not less than 40% of all identified acres will be covered by turf and landscape nutrient management plans; and (iii) within 48 months of permit coverage, not less than 75% of all identified acres will be covered by turf and landscape nutrient management plans. The operator shall not fail to meet the measurable goals for two consecutive years.
(c) MS4 operators with lands regulated under § 10.1-104.4 of the Code of Virginia shall continue to implement turf and landscape nutrient management plans in accordance with this statutory requirement.
(2) Operators shall annually track the following:
(a) The total acreage of lands where turf and landscape nutrient management plans are required; and
(b) The acreage of lands upon which turf and landscape nutrient management plans have been implemented.
(3) The operator shall not apply any deicing agent containing urea or other forms of nitrogen or phosphorus to parking lots, roadways, and sidewalks, or other paved surfaces.

d. Training. The operator shall conduct training for employees. The training requirements may be fulfilled, in total or in part, through regional training programs involving two or more MS4 localities provided; however, that each operator shall remain individually liable for its failure to comply with the training requirements in this permit. Training is not required if the topic is not applicable to the operator's operations and therefore does not have applicable personnel provided the lack of applicability is documented in the MS4 Program Plan. The operator shall determine and document the applicable employees or positions to receive each type of training. The operator shall develop an annual written training plan including a schedule of training events that ensures implementation of the training requirements as follows:
(1) The operator shall provide biennial training to applicable field personnel in the recognition and reporting of illicit discharges.
(2) The operator shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed during road, street, and parking lot maintenance.
(3) The operator shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed in and around maintenance and public works facilities.
(4) The 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).
(5) The operator shall ensure 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.
(6) The operator shall ensure that applicable employees obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law and its attendant regulations.
(7) The operators shall provide biennial training to applicable employees in good housekeeping and pollution prevention practices that are to be employed in and around recreational facilities.
(8) The appropriate emergency response employees shall have training in spill responses. A summary of the training or certification program provided to emergency response employees shall be included in the first annual report.
(9) The operator shall keep documentation on each training event including the training date, the number of employees attending the training, and the objective of the training event for a period of three years after each training event.

e. The operator shall require that municipal contractors use appropriate control measures and procedures for stormwater discharges to the MS4 system. Oversight procedures shall be described in the MS4 Program Plan.

f. At a minimum, the MS4 Program Plan shall contain:
(1) The written protocols being used to satisfy the daily operations and maintenance requirements;
(2) A list of all municipal high-priority facilities that identifies those facilities that have a high potential for chemicals or other materials to be discharged in stormwater and a schedule that identifies the year in which an individual SWPPP will be developed for those facilities required to have a SWPPP. Upon completion of a SWPPP, the SWPPP shall be part of the MS4 Program Plan. The MS4 Program Plan shall include the location in which the individual SWPPP is located;
(3) A list of lands where nutrients are applied to a contiguous area of more than one acre. Upon completion of a turf and landscape nutrient management plan, the turf and landscape nutrient management plan shall be part of the MS4 Program Plan. The MS4 Program Plan shall include the location in which the individual turf and landscape nutrient management plan is located; and
(4) The annual written training plan for the next reporting cycle.

g. Annual reporting requirements.
(1) A summary report on the development and implementation of the daily operational procedures;
(2) A summary report on the development and implementation of the required SWPPPs;
(3) A summary report on the development and implementation of the turf and landscape nutrient management plans that includes:
(a) The total acreage of lands where turf and landscape nutrient management plans are required; and
(b) The acreage of lands upon which turf and landscape nutrient management plans have been implemented; and
(4) A 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.

C. If an existing program requires the implementation of one or more of the minimum control measures of Section II B, the operator, with the approval of the board, may follow that program's requirements rather than the requirements of Section II B. A program that may be considered includes, but is not limited to, a local, state or tribal program that imposes, at a minimum, the relevant requirements of Section II B.

The operator's MS4 Program Plan shall identify and fully describe any program that will be used to satisfy one or more of the minimum control measures of Section II B.

If the program the operator is using requires the approval of a third party, the program must be fully approved by the third party, or the operator must be working towards getting full approval. Documentation of the program's approval status, or the progress towards achieving full approval, must be included in the annual report required by Section II E 3. The operator remains responsible for compliance with the permit requirements if the other entity fails to implement the control measures (or component thereof).

D. The operator may rely on another entity to satisfy the state permit requirements to implement a minimum control measure if: (i) the other entity, in fact, implements the control measure; (ii) the particular control measure, or component thereof, is at least as stringent as the corresponding state permit requirement; and (iii) the other entity agrees to implement the control measure on behalf of the operator. The agreement between the parties must be documented in writing and retained by the operator with the MS4 Program Plan for the duration of this state permit.

In the annual reports that must be submitted under Section II E 3, the operator must specify that another entity is being relied on to satisfy some of the state permit requirements.

If the operator is relying on another governmental entity regulated under 4VAC50-60-380 to satisfy all of the state permit obligations, including the obligation to file periodic reports required by Section II E 3,

the operator must note that fact in the registration statement, but is not required to file the periodic reports.

The operator remains responsible for compliance with the state permit requirements if the other entity fails to implement the control measure (or component thereof).

E. Evaluation and assessment.

1. MS4 Program Evaluation. The operator must annually evaluate:

a. Program compliance;

b. The appropriateness of the identified BMPs (as part of this evaluation, the operator shall evaluate the effectiveness of BMPs in addressing discharges into waters that are identified as impaired in the 2010 § 305(b)/303(d) Water Quality Assessment Integrated Report); and

c. Progress towards achieving the identified measurable goals.

2. Recordkeeping. The operator must keep records required by the state permit for at least three years. These records must be submitted to the department only upon specific request. The operator must make the records, including a description of the stormwater management program, available to the public at reasonable times during regular business hours.

3. Annual reports. The operator must submit an annual report for the reporting period of July 1 through June 30 to the department by the following October 1 of that year. The reports shall include:

a. Background Information.

(1) The name and state permit number of the program submitting the annual report;

(2) The annual report permit year;

(3) Modifications to any operator's department's roles and responsibilities;

(4) Number of new MS4 outfalls and associated acreage by HUC added during the permit year; and

(5) Signed certification.

b. The status of compliance with state permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures;

c. Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

d. A summary of the stormwater activities the operator plans to undertake during the next reporting cycle;

e. A change in any identified best management practices or measurable goals for any of the minimum control measures including steps to be taken to address any deficiencies;

f. Notice that the operator is relying on another government entity to satisfy some of the state permit obligations (if applicable);

g. The approval status of any programs pursuant to Section II C (if appropriate), or the progress towards achieving full approval of these programs; and

h. Information required for any applicable TMDL special condition contained in Section I.

F. Program Plan modifications.

1. Program modifications requested by the operator. Modifications to the MS4 Program are expected throughout the life of this state permit as part of the iterative process to reduce the pollutant loadings and to protect water quality. As such, modifications made in accordance with this state permit as a result of the iterative process do not require modification of this permit unless the department determines that the changes meet the criteria referenced in 4VAC50-60-630 or 4VAC50-60-650. Updates and modifications to the MS4 Program may be made during the life of this state permit in accordance with the following procedures:

a. Adding (but not eliminating or replacing) components, controls, or requirements to the MS4 Program may be made by the operator at any time. Additions shall be reported as part of the annual report.

b. Updates and modifications to specific standards and specifications, schedules, operating procedures, ordinances, manuals, checklists, and other documents routinely evaluated and

modified are permitted under this state permit provided that the updates and modifications are done in a manner that (i) is consistent with the conditions of this state permit, (ii) follow any public notice and participation requirements established in this state permit, and (iii) are documented in the annual report.

c. Replacing, or eliminating without replacement, any ineffective or infeasible strategies, policies, and BMPs specifically identified in this permit with alternate strategies, policies, and BMPs may be requested at any time. Such requests must be made in writing to the department and signed in accordance with 4VAC50-60-370, and include the following:

(1) An analysis of how or why the BMPs, strategies, or policies are ineffective or infeasible, including information on whether the BMPs, strategies, or policies are cost prohibitive;

(2) Expectations regarding the effectiveness of the replacement BMPs, strategies, or policies;

(3) An analysis of how the replacement BMPs are expected to achieve the goals of the BMP's to be replaced;

(4) A schedule for implementing the replacement BMPs, strategies, and policies; and

(5) An analysis of how the replacement strategies and policies are expected to improve the operator's ability to meet the goals of the strategies and policies being replaced.

d. The operator follows the public involvement requirements identified in Section II B 2 (a).

2. MS4 Program updates requested by the department. In a manner and following procedures in accordance with the Virginia Administrative Process Act, the Virginia Stormwater Management regulations, and other applicable state law and regulations, the department may request changes to the MS4 Program to assure compliance with the statutory requirements of the Virginia Stormwater Management Act and its attendant regulations to:

a. Address impacts on receiving water quality caused by discharges from the MS4;

b. Include more stringent requirements necessary to comply with new state or federal laws or regulations; or

c. Include such other conditions necessary to comply with state or federal law or regulation.

Proposed changes requested by the department shall be made in writing and set forth the basis for and objective of the modification as well as the proposed time schedule for the operator to develop and implement the modification. The operator may propose alternative program modifications or time schedules to meet the objective of the requested modification, but any such modifications are at the discretion of the department.

SECTION III

CONDITIONS APPLICABLE TO ALL STATE PERMITS

A. Monitoring.

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. Monitoring shall be conducted according to procedures approved under 40 CFR Part 136 (2001) or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this state permit.

3. The operator shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will insure accuracy of measurements.

B. Records.

1. Monitoring records/reports shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) and time(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

2. The operator shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this state permit, and records of all data used to complete the registration statement for this state permit, for a period of at least three years from the date of the sample, measurement, report or request for coverage. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the operator, or as requested by the board.

C. Reporting monitoring results.

1. The operator shall submit the results of the monitoring required by this state permit with the annual report unless another reporting schedule is specified elsewhere in this state permit.

2. Monitoring results shall be reported on a Discharge Monitoring Report (DMR); on forms provided, approved or specified by the department; or in any format provided the date, location, parameter, method, and result of the monitoring activity are included.

3. If the operator monitors any pollutant specifically addressed by this state permit more frequently than required by this state permit using test procedures approved under 40 CFR Part 136 (2001) or using other test procedures approved by the U.S. Environmental Protection Agency or using procedures specified in this state permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the department.

4. Calculations for all limitations that require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this state permit.

D. Duty to provide information. The operator shall furnish to the department, within a reasonable time, any information that the board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this state permit or to determine compliance with this state permit. The board may require the operator to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of surface waters, or such other information as may be necessary to accomplish the purposes of the CWA and Virginia Stormwater Management Act. The operator shall also furnish to the department upon request, copies of records required to be kept by this permit.

E. Compliance schedule reports. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this state permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized stormwater discharges. Pursuant to § 10.1-603.2:2 A of the Code of Virginia, except in compliance with a state permit issued by the board, it shall be unlawful to cause a stormwater discharge from a MS4.

G. Reports of unauthorized discharges. Any operator of a small MS4 who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance or a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110 (2002), 40 CFR Part 117 (2002) or 40 CFR Part 302 (2002) that occurs during a 24-hour period into or upon surface waters; or who discharges or causes or allows a discharge that may reasonably be expected to enter surface waters, shall notify the Department of Environmental Quality of the discharge immediately upon discovery of the discharge, but in no case later than within 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the Department of Environmental Quality and the Department of Conservation and Recreation, within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;

6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this state permit.

Discharges reportable to the Department of Environmental Quality and the Department of Conservation and Recreation under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of unusual or extraordinary discharges. If any unusual or extraordinary discharge including a " bypass " or " upset," as defined herein, should occur from a facility and the discharge enters or could be expected to enter surface waters, the operator shall promptly notify, in no case later than within 24 hours, the Department of Environmental Quality and the Department of Conservation and Recreation by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse affects on aquatic life and the known number of fish killed. The operator shall reduce the report to writing and shall submit it to the Department of Environmental Quality and the Department of Conservation and Recreation within five days of discovery of the discharge in accordance with Section III I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service some or all of the facilities; and
4. Flooding or other acts of nature.

I. Reports of noncompliance. The operator shall report any noncompliance which may adversely affect surface waters or may endanger public health.

1. An oral report shall be provided within 24 hours to the Department of Environmental Quality and the Department of Conservation and Recreation from the time the operator becomes aware of the circumstances. The following shall be included as information which shall be reported within 24 hours under this paragraph:
   a. Any unanticipated bypass; and
   b. Any upset which causes a discharge to surface waters.
2. A written report shall be submitted within five days and shall contain:
   a. A description of the noncompliance and its cause;
   b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
   c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
   The board or its designee may waive the written report on a case-by-case basis for reports of noncompliance under Section III I if the oral report has been received within 24 hours and no adverse impact on surface waters has been reported.
3. The operator shall report all instances of noncompliance not reported under Sections III I 1 or 2, in writing, at the time the next monitoring reports are submitted. The reports shall contain the information listed in Section III I 2.
   NOTE: The immediate (within 24 hours) reports required to be provided to the Department of Environmental Quality in Sections III G, H and I may be made to the appropriate Department of Environmental Quality's Regional Office Pollution Response Program as found at http://deq.virginia.gov/Programs/PollutionResponsePreparedness.aspx. Reports may be made by telephone or by fax. For reports outside normal working hours, leave a message and this shall fulfill the immediate reporting requirement. **For emergencies, the Virginia Department of Emergency Services maintains a 24-hour telephone service at 1-800-468-8892.**
4. Where the operator becomes aware of a failure to submit any relevant facts, or submittal of incorrect information in any report to the department or the Department of Environmental Quality, it shall promptly submit such facts or correct information.

J. Notice of planned changes.

1. The operator shall give notice to the department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The operator plans an alteration or addition to any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced:

(1) After promulgation of standards of performance under § 306 of the Clean Water Act that are applicable to such source; or

(2) After proposal of standards of performance in accordance with § 306 of the Clean Water Act that are applicable to such source, but only if the standards are promulgated in accordance with § 306 within 120 days of their proposal;

b. The operator plans alteration or addition that would significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this state permit; or

2. The operator shall give advance notice to the department of any planned changes in the permitted facility or activity; which may result in noncompliance with state permit requirements.

K. Signatory requirements.

1. Registration statement. All registration statements shall be signed as follows:

a. For a corporation: by a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a public agency includes:

(1) The chief executive officer of the agency, or

(2) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

2. Reports, etc. All reports required by state permits, and other information requested by the board shall be signed by a person described in Section III K 1, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Section III K 1;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

c. The written authorization is submitted to the department.

3. Changes to authorization. If an authorization under Section III K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Section III K 2 shall be submitted to the department prior to or together with any reports, or information to be signed by an authorized representative.

4. Certification. Any person signing a document under Sections III K 1 or 2 shall make the following certification:
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to comply. The operator shall comply with all conditions of this state permit. Any state permit noncompliance constitutes a violation of the Virginia Stormwater Management Act and the Clean Water Act, except that noncompliance with certain provisions of this state permit may constitute a violation of the Virginia Stormwater Management Act but not the Clean Water Act. State permit noncompliance is grounds for enforcement action; for state permit termination, revocation and reissuance, or modification; or denial of a state permit renewal application.

The operator shall comply with effluent standards or prohibitions established under § 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this state permit has not yet been modified to incorporate the requirement.

M. Duty to reapply. If the operator wishes to continue an activity regulated by this state permit after the expiration date of this state permit, the operator shall submit a new registration statement at least 90 days before the expiration date of the existing state permit, unless permission for a later date has been granted by the board. The board shall not grant permission for registration statements to be submitted later than the expiration date of the existing state permit.

N. Effect of a state permit. This state permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State law. Nothing in this state permit shall be construed to preclude the institution of any legal action under, or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by § 510 of the Clean Water Act. Except as provided in state permit conditions on "bypassing" (Section III U), and "upset" (Section III V) nothing in this state permit shall be construed to relieve the operator from civil and criminal penalties for noncompliance.

P. Oil and hazardous substance liability. Nothing in this state permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties to which the operator is or may be subject under §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law or § 311 of the Clean Water Act.

Q. Proper operation and maintenance. The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed or used by the operator to achieve compliance with the conditions of this state permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by the operator only when the operation is necessary to achieve compliance with the conditions of this state permit.

R. Disposal of solids or sludges. Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering surface waters.

S. Duty to mitigate. The operator shall take all reasonable steps to minimize or prevent any discharge in violation of this state permit that has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to halt or reduce activity not a defense. It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this state permit.

U. Bypass.

1. "Bypass," as defined in 4VAC50-60-10, means the intentional diversion of waste streams from any portion of a treatment facility. The operator may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Sections III U 2 and U 3.

2. Notice.

a. Anticipated bypass. If the operator knows in advance of the need for a bypass, prior notice shall be submitted, if possible at least 10 days before the date of the bypass.

b. Unanticipated bypass. The operator shall submit notice of an unanticipated bypass as required in Section III I.

3. Prohibition of bypass.

a. Bypass is prohibited, and the board or its designee may take enforcement action against an operator for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The operator submitted notices as required under Section III U 2.

b. The board or its designee may approve an anticipated bypass, after considering its adverse effects, if the board or its designee determines that it will meet the three conditions listed above in Section III U 3 a.

V. Upset.

1. An upset, as defined in 4VAC50-60-10, constitutes an affirmative defense to an action brought for noncompliance with technology based state permit effluent limitations if the requirements of Section III V 2 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.

2. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

3. An operator who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the operator can identify the cause(s) of the upset;

b. The permitted facility was at the time being properly operated;

c. The operator submitted notice of the upset as required in Section III I; and

d. The operator complied with any remedial measures required under Section III S.

4. In any enforcement proceeding the operator seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and entry. The operator shall allow the department as the board's designee, or an authorized representative (including an authorized contractor acting as a representative of the administrator), upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the operator's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this state permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this state permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this state permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring state permit compliance or as otherwise authorized by the Clean Water Act and the Virginia Stormwater Management Act, any substances or parameters at any location.

For purposes of this subsection, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. State permit actions. State permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the operator for a state permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any state permit condition.

Y. Transfer of state permits.

1. State permits are not transferable to any person except after notice to the department. Except as provided in Section III Y 2, a state permit may be transferred by the operator to a new owner or operator only if the state permit has been modified or revoked and reissued, or a minor modification made, to identify the new operator and incorporate such other requirements as may be necessary under the Virginia Stormwater Management Act and the Clean Water Act.

2. As an alternative to transfers under Section III Y 1, this state permit may be automatically transferred to a new operator if:

a. The current operator notifies the department at least two days in advance of the proposed transfer of the title to the facility or property;

b. The notice includes a written agreement between the existing and new operators containing a specific date for transfer of state permit responsibility, coverage, and liability between them; and

c. The board does not notify the existing operator and the proposed new operator of its intent to modify or revoke and reissue the state permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Section III Y 2 b.

Z. Severability. The provisions of this state permit are severable, and if any provision of this state permit or the application of any provision of this state permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this state permit, shall not be affected thereby.

Chesapeake Bay TMDL Action Plan Guidance Draft Revision Change Summary 3/19/2015

Corrections/Updates:
Corrections and updates are made throughout the document where applicable:

- Typos corrected as identified
- Corrected Error in Loading Rate Tables to lbs/ac/yr throughout the document
- Fixed Alphabetizing Error in Table of Contents
- Corrected permit citation in Part VI.3
- Incorporated link for reporting spreadsheet in to the document
- Removed "or 8" from the title of Example II.2. The aggregate method may not be used for Special Condition 8.
- The urban stream restoration appendix has been updated to reflect the changes that resulted from the revised Expert Panel Report. The link has been changed to the most recent report.

Additional Clarifying Language:

- Clarifying text added concerning Special Conditions 3, 7, and 8
    - Text added to flow chart in Appendix III concerning Special Condition 3
- Clarifying text added concerning the appropriate loading rates that should be used to determine the additional reductions required under Special Condition 7 and Special Condition 8
- Clarifying text added to explain credit for redevelopment, oversized BMPs, and more stringent development requirements
- Emphasized section concerning calculations for SLAF Grant not impacting permit compliance
- Text added concerning the treatment of lands in transition
- Clarifying text concerning the downward modification procedure was added. Downward modification is only allowable if the Bay Program efficiencies were used.

Substantive Changes:

Credit Guarantees:

This section has been updated to reflect change from "construction initiated" to "have had, at a minimum, funds approved as part of an adopted Capital Improvement Plan."

Crediting BMP Restoration (multiple changes made throughout the document):

The previous version of the guidance stated that permittees could not receive credit for BMP Restoration projects, which are permitted under the Bay Program's *Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects*. The Department has revisited this aspect of the guidance and has determined it is appropriate to allow permittees to receive credit for BMP Restoration. However, permittees may only receive incremental credit for improvements to BMPs or impoundments installed prior to 2006, regardless of whether they have been previously reported to the Bay Program.

Forested Lands (& Ag Lands) (multiple changes made throughout the document)*:*

The previous version of the guidance stated that permittees could exclude forested lands from their system and service area delineation. However, the document also states permittees could not receive credit for BMPs that treated these excluded lands. Upon further review, the Department has determined

permittees may receive credit for these lands, but it is not appropriate to use the loading rates provided in the permit table. In the revised guidance the Department has provided loading rates for forested lands by basin. Permittees may use these values to calculate reductions for BMPs that drain forested lands.

Similarly, permittees may receive credit for any agricultural lands draining to a BMP, but it is not appropriate to use the loading rates in the permit for these lands. Given the variability of agricultural lands, a loading rates table has not been included in the guidance. For these BMPs permittees should contact the Department for appropriate loading rates.

The stream restoration section of the guidance has also been revised to reflect this change. There is no baseline for forested acres or agricultural lands, so permittees may receive full credit for the proportion of forested acres that drain to the BMP. The discussion of Stream Restoration in the appendix and the example has been revised to reflect this change. The stream restoration calculation spreadsheets have also been updated.

Crediting Pre-July, 1 2009 BMPs (multiple changes made throughout the document)*:*

In the initial guidance, permittees could receive credit for "BMPs installed prior to July 1, 2009 that have not previously been reported to the Department , the structure **must** have been installed as a dedicated stormwater treatment facility (i.e. recreational ponds will **not** receive credit." Upon further review, this section appeared to conflict with "Appendix V.D, Existing BMP Efficiency Modification" as well as the Bay Program's Expert Panel Report.

The Permittee should see Part IV.2 of the guidance for more information on this subject. Changes have also been made to "Appendix V.D, Existing BMP Efficiency Modification" and a new "Appendix VI – Credit for BMPs installed prior to July 1, 2009" has been added to the document and includes a flow chart for additional clarity.

Action Plan Expectations (multiple changes made throughout the document)*:*

Text has been added to Part VI concerning our expectations for the level of detail that will be included in the Action Plan, although this is discussed throughout this section. For Special Condition 3 some text was added that reflects other changes throughout the document concerning the projects that are subject to special condition 3.

Text has also been added to Part VI.5 concerning our expectation for the level of detail we need for BMPs that are implemented to meet Special Condition 6.

Bay Program Retrofit Equations (Appendix V.B)*:*

There have been two changes made to the guidance concerning the Bay Program Retrofit Equations. One is an update: The Bay Program updated the curves in the Expert Panel Report. These have been incorporated in to the guidance along with the old curves. At this time and for this permit cycle the Department will accept calculations using either set of curves.

The other is a correction: We received comments indicating that it is not appropriate to use the RRM spreadsheet as a shortcut for estimating the Runoff Storage for use in the curve equation. This is correct. Upon further review the Department concurs with the comments that use of the RRM spreadsheet for this purpose results in the Runoff Storage being double counted.

Street Sweeping (Appendix V.F):

The street sweeping “efficiency” was removed from the Appendix V.C.1 table and a separate Appendix was added for street sweeping. This revision is in keeping with the most recent Bay Program guidance.

Chesapeake Bay TMDL Action Plan Guidance Draft Revision Change Table – 3/19/2015

SECTION	Change Date	Page #	Subject	Change
Throughout	3/19/2015	-	Correction	Corrected errors in loading tables. Removal should be in lbs/ac/yr, not lbs/ac.
Throughout	3/19/2015	-	Correction	Typos corrected where identified
PART I - BACKGROUND	3/19/2015	1	Correction	Corrected Alphabetizing Error in Definitions
PART I.2, Purpose	3/19/2015	2	Clarification	Added additional language to this section concerning required new source reductions
PART II - REQUIRED REDUCTIONS	3/19/2015	3	New Sources	Added additional language discussing the differences between Special Condition 3, 7, and 8
PART II.1, Scope of Reductions Required	3/19/2015	4	Clarification	Added text clarifying the appropriate loading rates to use to calculate additional reductions from new sources
PART II.2, Size and Extent	3/19/2015	5	Clarification	Added additional lands that can be subtracted from the service area - Concrete Products Facilities, NMMP, Ag Lands, Wetlands, Open Waters
PART II.2, Size and Extent	3/19/2015	5	Forested Lands	Edited footnote - removed text about not crediting forested land draining to a BMP. Added footnote about requirements for "forested."
PART II.2, Permit Tables	3/19/2015	6	Clarification	Clarified permit tables are the reductions for existing sources
PART II.2, Permit Tables	3/19/2015	6	Clarification	Clarified in footnote that once construction is completed on sites that are in transition as of June 30, 2009, those lands should be considered new sources subject to Special Condition 3.
PART III - Eligible BMPs	3/19/2015	7	Credit Guarantees	Changed credit guarantee from "BMPs that are completed or under construction" to "funds approved as part of an adopted Capital Improvement Plan."
PART III - ELIGIBLE BMPs	3/19/2015	7	Clarification	Bolded section concerning grants awarded under prior efficiencies
PART III.1, Calculating Credits	3/19/2015	7	Forested Lands	Edited text throughout section to reflect change to crediting for forested lands.

PART III.1, Calculating Credits	3/19/2015	8	Forested Lands	Added forested loading rate table and text concerning loading rates for Ag lands.
PART III.1, Calculating Credits	3/19/2015	8	Forested Lands	Added text stating that permittees may only receive credit for forested land use conversion of one half acre or greater.
PART III.2, Calculation Credits, Unregulated	3/19/2015	9	Forested Lands	Added text to clarify there is no baseline for forested lands, ag lands
PART III.3	3/19/2015	10	Clarification	Clarifying text added that explains how permittees may receive credit for BMPs that were primarily installed to meet VSMP requirements
Part III.4	3/19/2015	10	Crediting Pre-09 BMPs	Added text concerning credit for BMPs initially installed prior to June 30, 2009. This is discussed in greater depth in Part IV.2 and Appendix VI
PART IV.1	3/19/2015	11	Correction	Added link for reporting spreadsheet
PART IV.2, Historical Data	3/19/2015	11	Crediting Pre-09 BMPs	Added text clarifying the necessary steps permittees must take to receive credit for BMPs installed prior to July 1, 2009.
PART VI	3/19/2015	13	Correction	Removed "5%" from the discussion of reductions required this permit cycle. Reductions required under Special Condition 8 were not captured in this statement.
PART VI.3	3/19/2015	14	Correction	Corrected citation
PART VI.3	3/19/2015	14	New Sources	Added clarifying text concerning our expectation for meeting Special Condition 3.
PART VI.5	3/19/2015	15	Action Plan Expectations	Added clarifying text concerning our expectation for meeting Special Condition 5.
Appendix II, Example II.1	3/19/2015	36	Clarification	Added text clarifying the appropriate loading rates to use to calculate additional reductions from new sources
Appendix II, Example II.2	3/19/2015	38	Correction	Removed "or 8" from the title of the section. Aggregate Accounting method cannot be used for Special Condition 8.
Appendix II, Example II.2	3/19/2015	39	Clarification	Added text clarifying the appropriate loading rates to use to calculate additional reductions from new sources
Appendix III	3/19/2015	40	Clarification	Added citations for Special Condition 3 where appropriate

Appendix V.B	3/19/2015	47	Retrofit Curves	Retrofit Curves have been updated by the Bay Program. At this time the equations have been incorporated into the appendix, not the new curve tables.
Appendix V.B	3/19/2015	47	Retrofit Curves	Clarified that RRM spreadsheet may not be used to estimate the RS value for use in the curve equation
Appendix V.B	3/19/2015	47	Clarification	Text added to clarify the retrofit curves/equations cannot be used for dry ponds or extended detention ponds
Appendix V.D	3/19/2015	56	BMP Restoration	Changed text to incorporate BMP restoration in accordance with the Bay Program's Expert Panel Report.
Appendix V.D, Existing BMP Modification	3/19/2015	57	Clarification	Downward Modification. Permittees may only use downward modification w/ Bay Program Established Efficiencies
Appendix V.D, Existing BMP Modification	3/19/2015	57	BMP Restoration	Removed text stating the credit would not be available for BMP restoration
Appendix V.D, Existing BMP Modification	3/19/2015	58	Credit for Pre-09 BMPs	Edited example to reflect elimination of design era consideration
Appendix V.F	3/19/2015	61	Street Sweeping	Separate appendix for street sweeping added
Appendix V.G	3/19/2015	62	Land Use Change	Additional land uses that should be considered pervious added
Appendix V.I	3/19/2015	66	Urban Stream Restoration	Updated section to reflect expert panel report that was released after the guidance was finalized
Appendix V.I	3/19/2015	66	Urban Stream Restoration	Section edited throughout to reflect change that permittees may receive credit for forested lands
Appendix V.K	3/19/2015	72	Clarification	Language added to clarify that all redevelopment projects are eligible for credit, regardless of the initial land use
Appendix VI	3/19/2015	73	Crediting Pre-09 BMPs	Added Appendix explaining how permittees may receive credit for BMPs install prior to July 1, 2009

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION

Subject: Guidance Memo No. 14-2012

To: Regional Directors

From: Melanie D. Davenport, Director

Date: August 18, 2014

Revised: April XX, 2015

Copies: James Golden, Fred Cunningham, Allan Brockenbrough, Regional Water Permit Managers

Summary: This guidance document provides staff and permittees in the Chesapeake Bay Watershed with background information and procedures to meet the Chesapeake Bay TMDL Special Condition requirements in the 2013-2018 General Permit for Discharges of Stormwater from Small (Phase II) MS4s, the reissued Phase I MS4 permits, and any Individual Phase II permits that are issued. This document may also be used as a reference to meet the Chesapeake Bay TMDL load allocation for unregulated urban entities as well as local TMDL waste load allocations for nutrients and sediment.

Electronic Copy: An electronic copy of this guidance document is available in PDF format through DEQ's MS4 website.

Contact Information: Please contact Jaime Bauer, Office of VPDES permits, at (804) 698-4416 or Jaime.Bauer@deq.virginia.gov or with any questions regarding the application of this guidance.

Disclaimer:
This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate or prohibit any particular action not otherwise required or prohibited by law or regulation. If alternative proposals are made, such proposals will be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.

Guidance for Meeting the Special Condition for the Chesapeake Bay TMDL Requirements

TABLE OF CONTENTS

PART I - BACKGROUND

1. Definitions – For purposes of this guidance document, the following definitions shall apply:

Best Management Practices ("BMPs") – Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems

Existing Sources – Pervious and impervious urban land uses served by the MS4 as of June 30, 2009

Impervious Cover – A surface composed of material that significantly impedes or prevents natural infiltration of water into soil

Municipal Separate Storm Sewer System ("MS4") - A conveyance or system of conveyances otherwise known as a municipal separate storm sewer system, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains:

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

New Sources – Pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009

~~Prior Developed Lands ("Redevelopment") – Land that has been previously utilized for residential, commercial, industrial, institutional, recreation, transportation, or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity~~

Pollutants of Concern ("POC") – Total nitrogen ("TN"), total phosphorous ("TP"), and total suspended solids ("TSS")

Prior Developed Lands ("Redevelopment") – Land that has been previously utilized for residential, commercial, industrial, institutional, recreation, transportation, or utility facilities or structures, and that will have the impervious areas associated with those uses altered during a land-disturbing activity

Regulated Land – Regulated land refers to the conveyances and drainage area served by the permittee's MS4. For Phase II MS4s regulated land is the conveyances and drainage area that falls within a Census Designated Urbanized Area.

Unregulated Land – Unregulated land means those acres that are not owned or operated by the MS4 permittee AND are located outside the permittee's regulated land.

For terms not defined above, please refer to the 9VAC25-890-1 or 9VAC25-870-10 of the Virginia Administrative Code.

2. Purpose

In the Phase I and Phase II Chesapeake Bay TMDL Watershed Implementation Plan ("WIP") for the Chesapeake Bay Total Maximum Daily Load ("TMDL"), the Commonwealth committed to a phased approach to reducing nutrients and suspended solids discharging from Municipal Separate Storm Sewer Systems ("MS4"). The Special Condition for the Chesapeake Bay TMDL ("Special Condition") in the General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (VAR04), effective July 1, 2013, and the eleven Phase I Individual MS4 permits, as they are reissued, requires MS4 operators to develop a Chesapeake Bay TMDL Action Plan ("Action Plan") and submit it to the Virginia Department of Environmental Quality ("Department").

The Action Plan should provide a review of the current MS4 program, which demonstrates the permittee's ability to ensure compliance with the Special Condition and include the means and methods the permittee will use to meet 5.0% of the Level 2 (L2) scoping run reduction for existing development by the end of~~during~~ the first permit cycle as well as any reductions that may be required for new sources **initiating construction** between July 1, 2009 and June 30, 2014 and grandfathered projects. Level 2 implementation equates to an average reduction of 9.0% of nitrogen loads, 16% of phosphorus loads, and 20% of sediment loads from impervious regulated acres and 6.0% of nitrogen loads, 7.25% of phosphorus loads and 8.75% sediment loads from pervious regulated acres beyond 2009 progress loads and beyond urban nutrient management reductions for pervious regulated acreage.

The purpose of this guidance is to provide staff and permittees with methods for meeting the requirements of the Special Condition for the Chesapeake Bay TMDL and the WIP, with particular attention to the development of the Action Plan. It is intended to create consistency in reporting to the Department, as well as ensure that compliance and program evaluations are handled uniformly throughout the Commonwealth. This guidance is specific to the first reissuance of the Phase I MS4 permits since approval of the Chesapeake Bay TMDL and the 2013-2018 General Permit for Discharges of Stormwater from Small MS4s ("GP"). **If there are inconsistencies between the requirements described in this guidance document and the requirements in a permittee's Individual Permit, the individual permit is the controlling document. If additional guidance is needed concerning any inconsistencies, the permittee should contact the Department.**

The GP requires permittees to update their MS4 Program Plans to include the Action Plan no later than 24 months after permit coverage is initiated. Action Plans must be submitted with the Annual Report for the reporting period of July 1, 2014 through June 30, 2015 to the Department by October 1, 2015. Permittees regulated by an Individual VPDES Permit are required to modify their MS4 Program Plans to include the Action Plan and submit it to the Department in accordance with the schedule listed in the Individual Permit. The Action Plan becomes an enforceable part of the MS4 Program Plan unless specifically denied in writing by the Department within the time frame specified by the permit. Permittees may modify the Action Plans during the permit cycle to include new opportunities for reductions or address projects deemed infeasible. Any updates should be submitted to the Department in accordance with the Program Plan Modification section of the permit (GP Section II.F.1).

For reference, the Special Condition as found in 9VAC25-890-40.C of the General Permit is provided in *Appendix I* of this guidance document.

PART II – REQUIRED REDUCTIONS

The permittee's Action Plan should provide the Department with the means and methods that will be implemented to meet the POC reductions required ~~during~~ by the end of the first permit cycle. To develop this plan, the permittee will first need to determine the reductions required for each POC. This section identifies the scope of those reductions based on the Special Condition requirements and indicates the steps permittees should follow when delineating the extent of their MS4 system.

NOTE: As discussed below, existing sources ("pervious or impervious land uses served by the MS4 as of June 30, 2009") are subject to GP Section I.C.2.a.(6). New Sources ("pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009") are subject to GP Section I.C.2.a.(3), GP Section I.C.2.a.(7), and GP Section I.C.2.a.(8). If projects meet the requirements for GP Section I.C.2.a.(7) or GP Section I.C.2.a.(8) additional reductions are required. There are no additional reductions required for projects subject to GP Section I.C.2.a.(3), but the permit requires that permittees address the "means and methods that will be utilized to address discharges in to the MS4 from new sources." Please see *Part VI* of the guidance for additional information concerning the Department's expectations for meeting GP Section I.C.2.a.(3).

Please see *Appendix III* for additional clarification about which permit requirement applies to a given project.

1. Scope of Reductions Required by the Permit

Existing Development (GP Section I.C.2.a.(6))
The permit requires permittees to reduce 5.0% of the L2 Scoping Run POC reductions for existing sources as of June 30, 2009. During the first permit cycle, Phase II permittees do not need to account for the expanded urbanized areas that were identified as a result of the 2010 US Census. However, permittees should begin to plan for those areas and will need to include them in the updated Draft Action Plan that must accompany the permit reapplication submitted in accordance with the schedule described in the permit. The full 40% POC reductions on those "expanded areas" are required ~~during~~ by the end of the second permit cycle.

For newly designated Phase II permittees that were required to obtain a permit as a result of the 2010 Census, all regulated lands should be treated as "expanded areas." That means those permittees are not required to implement any BMPs during the first permit cycle. However, the full 40% POC reductions must be met on all regulated lands by the end of the second permit cycle.

New Sources with an Impervious Land Cover Condition Greater than 16% for the design of post-development stormwater management facilities (*GP Section I.C.2.a.(7))*
If a "new source," where construction is initiated between July 1, 2009 and June 30, 2014, meets an average impervious land cover condition of 16% or less for the design of post development stormwater management facilities~~,~~ no additional offsets are required under the Special Condition beyond those required for existing conditions (GP Section I.C.2.a.(6)). If the permittee has adopted an average impervious land cover condition that is greater than 16% or has a "fee-in-lieu of" or similar program that has allowed projects to be built at an average land cover condition greater than 16% for the design of post development stormwater management facilities, those projects may be subject to additional reductions under Special Condition Requirement 7 (GP Section I.C.2.a.(7)) if they disturb ~~1~~ one acre or greater. For a more detailed description of when additional reductions are necessary under Special Conditions ~~Requirement~~ 7, see *Appendix II*.

For accounting consistency, and in accordance with the permit language, permittees that adopted an established land cover condition greater than 16% should use the simple method to determine the excess TP that needs to be offset for projects subject to Special Condition 7. Table 4 in the permit should be used to determine the equivalent reductions necessary for TN and TSS. The loading rates from Tables 2a-d and Tables 3a-d *may not* be used for site by site calculations to determine the required reductions under Special Condition 7. ~~Permittees may determine the necessary offsets to meet GP Section I.C.2.a.(7) on a site by site basis~~ An example of how these calculations should be performed on a site by site basis is provided in (*Appendix II, Example II.1*).

~~However, to simplify the accounting process, the Department encourages permittees to calculate the reductions for this requirement in aggregate (*Appendix II*, *Example II.2*). This~~ Permittees that adopted a "fee-in-lieu of" or similar programs may have sites throughout their service area with variable final land cover conditions that may or may not have been offset through the implementation of BMPs. The Department acknowledges that it may represent a substantial burden to these permittees to determine reductions from these projects on a site by site basis. To simplify the accounting process, an aggregate accounting approach may be used. Aggregate accounting may be done by tracking the land use change on all regulated land between July 1, 2009 and June 30, 2014 to determine the increased loads that were not treated and must be addressed under~~ Special Condition 7~~this Special Condition Requirement~~. The aggregate approach must be applied to a permittee's entire service area. Permittees should note that using an aggregate approach may capture lands beyond those that fall under this requirement (i.e. lands less than an acre, lands that have an average impervious land use cover less than 16%).

The permittee should choose the most appropriate approach taking into consideration the (1) amount of development that must be accounted for throughout the regulated area, (2) the resources required to perform these calculations on a site by site basis, and (3) the quality of development records available to the permittee.

Grandfathered Projects with an Impervious Land Cover Condition Greater than 16% for the design of post-development stormwater management facilities (*GP Section I.C.2.a.(8))*

The permit also requires permittees to offset any increase in POC from grandfathered projects (as defined in 9VAC 25-870-48) that disturb one acre or greater~~,~~ and have an impervious land cover condition greater than 16% for the design of post-development stormwater management facilities. Those increases should be offset prior to the completion of the grandfathered projects in accordance with GP Section I.C.3.c. Since the increased loads must be entirely offset prior to completion of the project, ~~they~~ these projects must be accounted for on a ~~case by case basis~~ site by site basis. Permittees should use the simple method, in conjunction with Permit Table 4, to calculate the additional reductions required under Special Condition 8. The loading rates from permit tables 2a-d and 3a-d should not be used to calculate reductions on a site by site basis. For a more detailed description of when additional reductions are required under Special Condition Requirement 8 (GP Section I.C.2.a.(8)), see *Appendix II*.

~~A flowchart has been included as *Appendix III* to clarify which permit requirement applies to a given project.~~

2. Calculating Reductions for this Permit Cycle

Permittees should use the appropriate basin tables provided in the permit to estimate the pollutant source loads as of June 30, 2009 and calculate the pollutant reductions necessary to meet the permit requirements. In order to estimate these reductions, as well as calculate how the required reductions will be met, permittees will first need to estimate:

1. The size and extent of their regulated MS4 system as of June 30, 2009; and
2. The total regulated acres of urban pervious and urban impervious surface served by the MS4 as of June 30, 2009.

If there is incomplete data concerning either the extent of the MS4 system or the number of pervious and impervious acres served, permittees should use their best professional judgment to make the best estimates possible. Diagrams have been included in *Appendix IV* to illustrate some of the potential delineation issues discussed in this section.

Size and Extent of the MS4

When estimating the size of the MS4 system, the permittee should not include in its service area the conveyances and drainage area that are regulated by a separate MS4 permit. For permittees that have interconnected systems, MOUs should be considered as a method to clearly differentiate which operator is responsible for which part of the system. For this permit cycle, permittees may also exclude from their regulated urban impervious and regulated urban pervious cover calculations:

1. ~~(1) l~~Land regulated under any General VPDES permit that addresses industrial stormwater, including the ~~the~~ General VPDES Permit for Stormwater Associated with Industrial Activity (VAR05), the General VPDES Permit for Concrete Products Facilities (VAG11), and the Nonmetallic Mineral Processing General Permit (VAR84);
2. L~~(2) l~~ands regulated under an individual – VPDES permit for industrial stormwater discharges;~~, and (3) f~~
3. Forested L~~l~~ands[1][2];~~.~~
4. Agricultural Lands;
5. Wetlands; and,
6. Open Waters.

Permittees should clearly document the areas within their jurisdiction that are not included in their regulated acres so the Department is able to verify an appropriate methodology was used. Permittees are encouraged to provide a map depicting the MS4 boundaries, lands serviced by the MS4, and any lands that the permittee has excluded as allowed above.

For Phase II permittees, the Census designated Urbanized Areas and jurisdictional boundaries may be used as a conservative estimate of the area the MS4 serves. It is expected that this data will be refined as the permittee completes the mapping exercise required in Section II B.3.a.(3) of the General Permit. Again, any expanded areas that resulted from the 2010 U.S. Census are not required to be included in the first permit cycle reductions, and Phase II permittees that were identified and designated as a result of the 2010 Census are not required to implement BMPs until the second permit cycle. ~~During~~ By the end of the next permit cycle these permittees are expected to achieve the full 40% of the L2 scoping run reductions for existing sources in the expanded areas and should plan accordingly. Where data is unavailable or boundaries are unclear, the permittee will need to exercise its best professional judgment in determining the boundaries and service area of its MS4.

Mapping Tools

[1] To be considered "forested" lands must be undeveloped, meet the density requirements described in Appendix V.G, and be a minimum of one half contiguous acres.

[2] ~~Forested lands may be excluded because they were not assigned a loading in the Bay Program Model. If a permittee chooses to exclude forested acres from its initial reduction calculations, forested lands should also be excluded from the load reduction calculations for individual BMPs.~~

To estimate the regulated urban impervious and regulated urban pervious acres served by the MS4 as of June 30, 2009 the Department strongly encourages permittees to use the best GIS resources available. In all cases, permittees should use their best professional judgment and the best available data to estimate the number of regulated urban pervious and regulated urban impervious acres served by their MS4 system. Permittees should include a summary of the methodology that was used to estimate the regulated urban impervious acres and regulated urban pervious acres as part of their Action Plan so the Department is able to verify an appropriate method was used.

Base aerial imagery is available to permittees through the Virginia Base Mapping Program, which is administered by the Virginia Geographic Information Network (VGIN). These images can be viewed free of charge using the VEGIS viewer at: http://www.deq.virginia.gov/mapper_ext/default.aspx?service=public/wimby or through VGIN's website. Permittees may use the "Most Recent Imagery" map available through the Virginia GIS Clearinghouse at: http://vgin.maps.arcgis.com/home/ to estimate the amount of pervious and impervious surface in their MS4. This map is a composite of two images that can be accessed separately through this webpage: http://gismaps.vita.virginia.gov/arcgis/rest/services. This site contains links to the most up to date imagery through the "VBMP2009" and "VBMP2011" links. "VBMP2009" contains information for the eastern half of the state, while "VBMP2011" is the most recent map of the western half of the state. This imagery is provided at 1'X1' resolution, which is the image and analytical resolution the Department recommends permittees use.

Permit Tables – Reductions for Existing Conditions

Once the regulated urban pervious acres and regulated urban impervious acres are estimated, the permittee ~~can~~ should use the appropriate table(s) provided in the permit to estimate the existing source loads for the pollutants of concern. If a permittee has lands that were ~~in transition or~~ under construction as of June 30, 2009 the Department recommends the permittee use the pre-construction land use as the baseline.[3] ~~-~~The first set of tables (*Tables 2a-d*) in the Special Condition provides an estimate of the total pollutant loads entering the applicable river basin based on the June 30, 2009 Progress Run. The second set of tables (*Tables 3a-d*) allows the user to calculate the total load reductions required during this permit cycle in pounds. This is the 5.0% reduction for existing development that the permittee must meet within the first permit cycle.

If a permittee's MS4 system discharges to multiple river basins, the permittee will need to calculate pollutant loads and load reductions for each basin to which the MS4 discharges.

[3] Once construction is completed, these lands should be considered "new sources" subject to GP Section I.C.2.a.(3)

PART III – ELIGIBLE BMPS AND CREDIT OPPORTUNITIES[4]

To meet the reduction requirements for this permit cycle, permittees should implement BMPs that are in the Virginia Stormwater BMP Clearinghouse (*Appendix V.A*) or have been approved by the Chesapeake Bay Program ("Bay Program") (*Appendices V.B-V.J~~I~~)*. As BMPs are approved by the Bay Program during the permit cycle, they may also be used to meet the implementation requirements of this permit. Permittees are encouraged to work with the Department throughout Action Plan development, including submitting draft plans for review.

The means and methods provided to the Department must show that, based on the information available at the time the Action Plan is approved, the BMPs implemented by the permittee will meet the reductions required by the Special Condition for the Chesapeake Bay TMDL for this permit cycle. Implementation of the BMPs in the permittee's approved Action Plan will demonstrate compliance with the reduction requirements for this permit cycle regardless of efficiency changes that may occur after the Action Plan is approved. Any changes in established efficiencies will not be retroactively applied to projects approved to meet reductions for this permit cycle. The same credit guarantee will apply to any BMPs included in the Action Plan that ~~are completed or under construction by the end of the permit term~~have had, at a minimum, funds approved as part of an adopted Capital Improvement Plan. Permittees should submit supporting documentation with reapplication and submission of the subsequent Action Plan that lists the projects that have not been implemented, but have met this financing requirement. If funds have not been approved for a BMP prior to submission of the second Action Plan, the permittee will need to recalculate reductions from those BMPs based on the most up to date efficiencies. For planning purposes, when multiple reduction efficiencies are available through Bay Program BMPs, expert panel reports, or other sources, the permittee is encouraged to use the most conservative efficiency value~~s for any future projects not expected to be completed or under construction by the end of the permit term~~.

Permittees should also note that projects may require local, state, or federal permits such as the General Permit for Discharges of Stormwater from Construction Activities or Virginia Water Protection Permits and this should be taken into account as BMPs are selected. **NOTE: If a permittee has been awarded a grant for reductions based on efficiencies that ~~have been~~are revised prior to submittal of the Action Plan, the award will not be revoked or altered due to these circumstances. However, to meet the Special Condition, permittees will need to recalculate the reductions from those BMPs based on the most up-to-date efficiencies at the time the Action Plan is completed. The Department's review of nutrient and sediment reductions included in the Action Plan is independent of the review of any previous grant applications for a given BMP.**

1. Calculating Credits

Estimating the pollutant reductions provided by an installed BMP is primarily a two-step process. First, the permittee should calculate the load draining to the BMP~~ should be calculated using the applicable loading rates in the permit in Tables 2a-d~~. Second~~ Next~~, the reductions created by a BMP should be applied to that calculated load (for most structural BMPs this will be a percent efficiency). The result is the POC reduced. Depending on the BMP installed this procedure may vary slightly. More detailed information concerning how to perform calculations for accepted BMPs can be found in *Appendix V*. **Permittees should submit their BMP data with their Annual Report using the spreadsheet provided on DEQ's website.**

[4] This guidance focuses solely on urban BMPs. If there are other types of land that are within a permittee's service area and/or drain to the permittee's system, the permittee should refer to the Bay Program's guidance for applicable BMPs. The application of these BMPs will be reviewed on a case by case basis.

Permittees should use the loading rates in Tables 2a-d of the permit to calculate the pollutant loads draining to a BMP except if those loads are from (1) forested lands or (2) agricultural lands. If a permittee has identified forested or agricultural acres that drain to a BMP, the permittee may receive credit for reductions from those lands, regardless of whether or not they have been included in the initial service area delineation. However, it is not appropriate to use the loading rates found in the permit tables for these land uses. For forested lands, permittees should use the following loading rates:

Table III.1 - Forested loading rates by basin:

River Basin	TN (lbs/ac/yr)	TP (lbs/ac/yr)	TSS (lbs/ac/yr)
James	2.36	0.13	77.38
Potomac	5.29	0.13	79.91
Rappahannock	4.03	0.13	57.35
York	2.13	0.07	27.61

Due to the variability of agricultural lands, it is not appropriate to use a single set of loading rates for pollutants loads from these lands. If permittees have or plan to install BMPs that receive drainage from agricultural lands, the Department should be contacted for the appropriate loading rates.

Permittees may receive credit for:

A. *Structural BMPs* –To calculate the credits generated by structural BMPs, the permittees may use, as applicable, (1) the efficiencies in the Virginia Stormwater BMP Clearinghouse (*Appendix V.A*), (2) the retrofit performance curves provided by the Bay Program (*Appendix V.B*), or (3) the approved or interim Bay Program efficiencies (*Appendix V.C*). Permittees may also receive credit for BMP Enhancements and Conversions (*Appendix V.D*). The impact of treatment trains should also be considered by permittees (*Appendix V.E*).

B. *Land Use Change* – To calculate the credits generated by a land use change, permittees should use the conversion factors presented in *Appendix V.~~F~~G*. Conversions to forested land will only be credited at areas greater than one half of an acre. In addition to the Land Use Change Credit, permittees may receive an efficiency credit for Forest Buffers which is explained in greater detail in *Appendix V.~~G~~H*.

C. *Urban Stream Restoration* – There are five methodologies permittees may use to calculate reductions from Urban Stream Restoration (*Appendix V.~~H~~I)*. In accordance with GP Section I.C.2.b.(1) any BMPs implemented on unregulated lands must exceed baseline reductions. In accordance with GP Section I.C.2.b, the credit for stream restoration projects must be adjusted to account for the baseline reduction required on the unregulated land draining to the restored stream.

D. *Urban Nutrient Management ("UNM")* – Permittees may receive credit for Urban Nutrient Management plans that are developed for unregulated land, public lands one contiguous acre or less[5], and/or privately owned lands that are not golf courses where nutrients are applied. The recommended method for calculating reductions for Urban Nutrient Management is described in *Appendix V.~~I~~J*.

E. *Nutrient Trading* – Permittees may utilize the DEQ nutrient trading or offset program in accordance with § 62.1-44.19:21.A of the Code of Virginia, governing trading and offsetting. Regulations concerning certification of non-point source nutrient trading along with additional guidance are forthcoming.

[5] Permittees may not receive credit for UNM plans developed on "lands owned or operated by the MS4 operator where nutrients are applied to a contiguous area of more than one acre" because those plans are an existing permit requirement (GP Section II.B.2.c) and are assumed reductions in the WIP.

F. *Redevelopment* – Permittees may receive credit for redevelopment projects if the pre-development pollutant load is reduced (*Appendix V.K~~J~~*). **NOTE:** Additional nutrient reductions beyond the VSMP requirements are also potentially creditable through the DEQ nutrient trading program; however, the MS4 permittee and land owner may not both take credit for the reductions. Reduction calculations for individual BMPs implemented on redeveloped land should be performed in the same manner as BMPs applied to existing development.

Permittees may submit alternate POC reduction methods, which the Department will review on a case by case basis. The Department has developed guidance for the approval of Manufactured Treatment Devices ("MTD") that permittees may find useful. This guidance can be found on DEQ's website at: http://www.deq.virginia.gov/Portals/0/DEQ/Water/Guidance/142009.pdf. Currently, the MTD approval process only certifies a practice's TP reductions. Permittees should use the Bay Program curves and/or efficiencies if there is an analogous BMP. If there is not an analogous Bay Program BMP for an approved MTD, the Department will consider TN and TSS credits for those BMPs on a case by case basis.

2. Calculating Credits for BMPs I~~i~~mplemented on Unregulated Lands[6]

In accordance with GP Section I.C.2.b.(1) permittees may receive credit for BMPs implemented on unregulated land provided any necessary baseline is met first. Depending on the BMP type, baseline means:

A. *Baseline for Structural BMPs* **–** The baseline for structural BMPs is intended to be consistent with the nutrient trading regulations. In accordance with §62.1-44.19:21 of the Code of Virginia, baseline for urban practices from new development shall be in compliance with post-construction nutrient loading requirements of the Virginia Stormwater Management Program regulations, which has been set at 0.45 lbs TP/acre/year for practices installed between July 1, 2009 and June 30, 2014 and 0.41 lbs TP/acre/year for projects installed after July 1, 2014. Any POC reductions beyond these values may contribute to the reductions required by the Special Condition. Associated TN and TSS for the BMPs credited on unregulated land should be calculated on a BMP by BMP basis.

B. *Baseline for Stream Restoration* **–** Permittees may receive full credit for the proportion of regulated urban land that drains to a stream restoration project and an adjusted credit for the proportion of unregulated urban land that drains to the stream restoration project. There is no baseline that must be met for any forested or agricultural lands that drain to the project. The credit for unregulated land must account for baseline reductions required by the TMDL and WIP. The method permittees should use to calculate Baseline for these practices is provided in *Appendix V.I~~H~~*.

C. *Baseline for Urban Nutrient Management* **–** Baseline for urban nutrient management is based on the commitments the Commonwealth made in the WIP, which calls for Nutrient Management Plans ("NMP"s) on 48% of urban pervious lands. If permittees develop NMPs for either public or privately owned lands (except golf courses) that fall outside of the regulated MS4 service area, the permittee may take credit for the lbs/TN and lbs/TP addressed in the plan minus the 48% required by the WIP. See *Appendix V.J~~I~~.1* for additional information.

3. BMPs Installed to meet Development or Redevelopment Requirements

[6] If the BMP was funded by a 319 nonpoint source grant, it may be contrary to the funding award to seek credit towards required reductions under the Special Condition.

In general, permittees may not receive credit towards the reductions that are required under GP Section I.C.2.a.(6) or may be required under GP Section I.C.2.a.(7) and/or GP Section I.C.2.a.(8) for BMPs installed after July 1, 2009 that were implemented to meet the minimum VSMP technical criteria phosphorous removal requirement (Part 2C or 2B) for new development or other minimum regulatory requirements. However, permittees may receive credit for these BMPs under the following circumstances:

1. **Redevelopment:** As is mentioned throughout this document permittees may receive credit for pollutant reductions from redevelopment, regardless of the initial land cover condition of the site. This applies to any redevelopment project initiated after July 1, 2009.
2. **Stricter Development Requirements:** Permittees may have enacted development requirements that were stricter than the state standards, such as adopted an average land cover condition less than 16% for the design of post-development stormwater management facilities or required the implementation of stormwater management facilities for projects that disturb less than an acre. Any BMPs installed to meet these stricter standards after July 1, 2009 (or any BMP capacity that exceeds the state standards and/or average land cover condition) may be counted towards the reductions required under Special Condition 6, 7, and/or 8.
3. **Oversized BMPs:** If an oversized BMP was installed to accommodate future development, but the excess capacity has not been utilized, permittees may use that capacity to meet required reductions. If permittees choose to use the remaining BMP capacity to meet their TMDL requirements that capacity can no longer be used to meet the VSMP requirements for future development.

Permittees will receive the full credit for any reductions that result from redevelopment projects. For oversized BMPs and stricter development requirements permittees will receive credit for the difference between the BMP's reductions and the reductions required under the VSMP. This incremental credit difference applies to all pollutants. To determine the incremental difference between the VSMP requirements and the credit that will be received for TN and TSS permittees should determine the efficiency difference between what is required and the performance of the BMP for TP and apply the same efficiency difference to the remaining pollutants.

4. Credit for BMPs and Impoundments Initially Installed Prior to July 1, 2009

The Department has revised the crediting procedure for BMPs and Impoundments that were initially installed prior to July 1, 2009. This was done to ensure that the guidance is internally consistent, as well as to improve consistency with the Bay Program's *Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects* and simplify the crediting process. The method for crediting these BMPs depends on (1) when the BMP was initially installed and (2) whether the BMP was previously reported to the Department.

Please see *Part IV.2* and *Appendix VI* for additional information on this subject.

PART IV – REPORTING CONTROL MEASURES

1. Implementation for this Permit Cycle

For all BMPs that are implemented to meet the Special Condition requirements, **the permittee should report BMP information in accordance with Section I.C.4 of the General Permit using the spreadsheet developed by the Department**. When submitting this information with the appropriate Annual Report, permittees should designate which BMPs were employed to meet the Chesapeake Bay TMDL POC load reductions.

The method permittees use to estimate the acres treated by each BMP depends on the retrofit. *Appendix VII* provides guidelines for how the acres treated should be considered for each BMP type. In addition to the information required in Section I.C.4 of the General Permit, the permittees should ~~consider maintaining and~~ submit~~ting~~ more detailed calculations for the BMPs that are planned and implemented. This will ensure that the Department can verify the permittee will meet the POC reductions required by the permit.

2. Historical Data

The Department strongly encourages permittees to submit historical data for BMPs installed prior to June 30, 2013.[7] This historical information should include BMPs implemented throughout the permittee's jurisdiction, not just those BMPs implemented in the permittee's regulated service area. If this historical data is provided to the Department by September 1, 2015 using the spreadsheet provided on DEQ's MS4 website, permittees will receive full credit for BMPs that were:

1. initially installed on or after January 1, 2006 and prior to July 1, 2009,
2. constructed to address stormwater quality within the permittee's regulated service area and;
3. not reported to the Commonwealth prior to June 30, 2009.

To receive credit for previously unreported BMPs installed on or after January 1, 2006 and prior to July 1, 2009, permittees will need to include the following in their Action Plan:

1. An affirmative statement that a complete list of historical BMPs was or will be submitted to the Department by September 1, 2015. Permittees may submit this data as part of the "Historical Data Clean-Up" effort that is currently ongoing.
2. Appropriate calculations for the BMPs that were not previously reported to the Department that the permittee is claiming credit for towards their required reductions.

The September 1, 2015 deadline for historical data applies to both **Phase I and Phase II** permittees, regardless of when the permittee's initial Action Plan is due. The Department has BMP information reported prior to 2009 for the following permittees:

- VAR040005 – City of Richmond
- VAR040028 – York County

[7] While permittees will not receive credit for BMPs installed prior to July 1, 2009 that have previously been reported to the Department, a more accurate accounting of the permittee's historical BMPs will allow the Bay Program to better refine its waste load allocations for Virginia in the next phase of the Bay Program Model. If the Department does not receive data from permittees about existing BMPs, no data will be reported to the Bay Program on behalf of that MS4. This may have a direct impact on the permittee's pollutant reduction requirements in subsequent permits.

- VAR040042 – US Army Fort Monroe
- VAR040056 – Stafford County
- VAR040057 – City of Alexandria
- VAR040069 – USMC Quantico
- VAR040073 – University of Virginia
- VAR040112 – James Madison University
- VAR040115 – VDOT
- VA0088617 – Henrico County
- VA0088650 – City of Norfolk

These 11 permittees will be contacted by the Department concerning previously reported BMP data in the Department's files. Permittees not included in this list may reasonably assume no BMP data was reported to the Department prior to June 30, 2009.

Eligible unreported BMPs must be submitted for credit as part of the permittee's first Chesapeake Bay TMDL Action Plan. Permittees will not receive credit for previously unreported BMPs that are submitted as a component of the second phase and/or third phase Chesapeake Bay TMDL Action Plan.

~~The Department strongly encourages permittees to submit historical data for BMPs installed prior to June 30, 2009 using the DEQ provided spreadsheet found on DEQ's MS4 website. While permittees will not receive credit for BMPs installed prior to July 1, 2009 that have previously been reported to the Department a more accurate accounting of the permittee's historical BMPs will allow the Bay Program to better refine its waste load allocations for Virginia in the next phase of the Bay Program Model. To receive credit for BMPs installed prior to 2009 that have not previously been reported to the Department, the structure **must** have been installed as a dedicated stormwater treatment facility (i.e. recreational ponds will **not** receive credit). If the Department does not receive data from permittees about existing BMPs, no data will be reported to the Bay Program on behalf of that MS4. This may have a direct impact on the permittee's pollutant reduction requirements in subsequent permits.~~

~~**NOTE:** The Department must submit all calibration data to the Bay Program by September, 2015. To ensure all historical data can be incorporated into the package sent to EPA, permittees will need to submit their Historical Data to the Department on or before June 30, 2015.~~

PART V – REAPPLICATION REQUIREMENTS

For reapplication, the permittee will need to estimate the POC reductions that will be required for the next permit cycle in accordance with Section I.C.5.b. of the General Permit. The draft second phase Chesapeake Bay TMDL Action Plan required under that section should be developed using the most recently approved BMP efficiencies and crediting protocols at the time of submission.

The purpose of the requirements in Section I.C.5.b is to ensure the full 40% reductions are achieved for existing development, expanded areas designated in the 2010 Census, and new sources developed between 2009 and 2014 for which the land cover condition was greater than 16% impervious for the design of post-development stormwater management facilities.

PART VI – CHESAPEAKE BAY TMDL ACTION PLAN ELEMENTS

This section describes the required and suggested elements that should be included to ensure the Chesapeake Bay TMDL Action Plan is approvable. Providing this information as described in this guidance document should ensure consistency in reporting as well as the plan review process. The Action Plan should allow the Department to verify that the permittee will be able to meet the requirements for the Special Condition for the Chesapeake Bay by the end of the first permit cycle.

The Action Plan should include sufficient supporting material to show that the permittee has:

1. Calculated the full scope of offsets for existing development and new sources that are required to be made ~~during~~ by the end of the first permit cycle (See *Part II*, *Appendix II*, and *Appendix III*); and,
2. Determined the methods that will be used to meet the ~~5.0%~~ reductions required by the end of the first permit cycle (See *Part III* and *Appendix V*)

In addition to this, the permit requires that the Action Plan also include:

1. A review of the current MS4 permit authority and implementation capabilities,
2. Existing, new, and modified legal authorities necessary to meet required reductions;
3. An estimate of future grandfathered projects and their acreage;
4. Expected costs for implementing the Action Plan; and,
5. A public comment process and period.

The references in this section refer to the General Permit requirements which can be found in *Appendix I*. The majority of requirements in the Phase I Permits Special Condition are the same as those in the General Permit. Note that the Phase I Individual Permits include a more extensive "Public Comments" requirement (section 10.a and 10.b below).

For existing Phase II permittees, the Action Plans must be completed no later than 24 months after permit coverage and submitted to the Department with the appropriate ~~annual~~ Annual ~~report~~Report. For permittees covered by the GP, the submitted Action Plan becomes effective and enforceable 90 days after the date received by the Department unless specifically denied in writing by the Department in accordance with Section I.C.2.a of the General Permit. Permittees covered by Individual Permits must follow the schedule in their permit. Individual Permit permittees will receive an affirmative response from the Department before their Action Plans become enforceable.

Permit Requirements

1. Current Program and Existing Legal Authority (*General Permit Section I.C.2.a.(1)*)
A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition;

Localities should include by reference the components of their current MS4 program, or other relevant legal authorities, that will be used to meet the Special Condition. This should include a list of the relevant existing legal authorities (i.e. ordinances, permits, orders, contracts, inter-jurisdictional agreements, and/or other enforceable mechanisms).

2. New or Modified Legal Authority (*General Permit Section I.C.2.a.(2)*)
The identification of any new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition;

New or modified legal authorities that were or will be developed to comply with the Special Condition should be listed. The list should include either (1) why the legal authority was or will be developed or (2) why the existing legal authority needs to be modified. If no new legal authorities are required for permit compliance than a statement as such should be made in place of a list.

3. Means and Methods to Address Discharges from New Sources *(General Permit Section I.C.2.a.(3)*)
The means and methods that will be utilized to address discharges into the MS4 from new sources;

"New Sources" means pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009. This Special Condition requirement applies to all new sources that ~~would otherwise~~ require post-development stormwater runoff control, as described in GP Section II.B.5~~4~~.a.

If the new source disturbs one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities, the permittee should see *Part VI.6*, *Part VI.7,* and *Appendix II* of this guidance. Additional offsets may be necessary.

If the new source does not utilize an average impervious land cover condition greater than 16% for the design of post development stormwater management facilities no additional offsets are required under the Special Condition beyond those for existing development. Similarly, if a new source disturbs less than 1 acre, no additional offsets are required under the Special Condition beyond those for existing development.

The permittee may fulfill this requirement with a short narrative describing the programmatic tools the permittee uses to address new sources, such as adherence with the VSMP regulations for the implementation of post-development stormwater management facilities or description of more stringent local requirements if applicable.~~.~~

4. Estimated Existing Source Loads and Calculated Total Pollutant of Concern (POC) Required Reductions *(General Permit Section I.C.2.a.(4) and (General Permit Section I.C.2.a.(5)*)
An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable [Table/Tables] in this section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate;

A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable [Table/Tables] in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator

shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.[8]

The POC loads and required reductions should be calculated using the tools described in this guidance document. The permittee should, at a minimum, provide a summary describing how pervious and impervious surface for the MS4 was estimated (e.g. the GIS resources that were used). The Department will need this information to verify that the method used is acceptable. Please see *Part II.2* for additional guidance concerning the delineation of these areas.

Completed calculation tables from the permit should be submitted.

5. Means and Methods to Meet the Required Reductions and Schedule *(General Permit Section I.C.2.a.(6)*)

The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions;[9]

This section should ~~describe~~ list the management practices and retrofit programs (including improvements from redevelopment) that have or will be implemented between July 1, 2009 and the end of the first permit cycle to achieve the 5.0% reductions required for existing development. The permittee should support its plan with calculations that show how the reductions will be met. Any credit trading that is used to meet reductions should also be described here.

Permittees are encouraged to submit this information in an electronic spreadsheet with a summary page that serves as a ledger showing:

- the total reductions required;
- each practice that will be implemented;
- the approximate location of the project, and;
- the load that will be reduced by each project.

Permittees should **not** submit full plans and specs for individual BMPs as part of the Action Plan. However, these plans should be available to the Department upon request.

The schedule should include estimates of when new management practices will be initiated, when BMP construction will begin, and when BMP installation is expected to be completed. These estimates can be provided as the annual benchmarks required by the permit. For BMPs that have already been implemented at the time the Action Plan is submitted, the permittee should indicate when they were installed.

6. Means and methods to offset increased loads from new sources initiating construction between July 1, 2009 and June 30, 2014 *(General Permit Section I.C.2.a.(7)*)

The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development

[8] This last sentence applies to Phase II MS4s only.

[9] ~~The Arlington Permit goes on to say: *The means and methods implemented prior to July 1, 2009 shall not be credited towards meeting the required reductions indentified in Part I.D.b.1)(c).*~~

stormwater management facilities. The operator shall utilize the [applicable table] in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.

Permittees may account for these additional offsets on a site by site basis, but the Department recommends taking an aggregate approach to demonstrate compliance with this Special Condition requirement. At a minimum permittees should provide (1) the total additional POC loads created by "new sources" and (2) the 5.0% of those loads permittees must offset ~~during~~ by the end of this permit cycle. The BMPs that will be implemented to address them should also be included. See *Appendix II* of this guidance for more information.

7. Means and methods to offset increased loads from grandfathered projects that begin construction after July 1, 2014 (*General Permit Section I.C.2.a.(8)*)

The means and methods to offset the increased loads from projects as grandfathered in accordance with 9VAC25-870-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids.

Increases in the POC load from grandfathered projects **initiating** construction after July 1, 2014, must be offset prior to completion of the project, in accordance with GP Section I.C.3.c. Permittees should include an estimate of the number of acres impacted by grandfathered projects, which will be used to estimate the pollutant loadings created by these projects. This estimate can be provided as an aggregate. The best available data should be used, but where data is unavailable permittees should use their best professional judgment. The strategies that will be used to address this type of development, including any nutrient trading, should also be included.

8. A list of future projects, and associated acreage that qualify as grandfathered *(General Permit Section I.C.2.a.(10)*)

A list of future projects and associated acreage that qualify as grandfathered in accordance with 9VAC25-870-48

To fulfill this requirement, permittees should list projects that have been approved or have an obligation of locality, state, or federal funding prior to July 1, 2012, but have not received coverage under the General Permit for Discharges of Stormwater from Construction Activities prior to July 1, 2014. This permit requirement applies solely to new development, not redevelopment projects.

9. An estimate of the expected cost to implement the necessary reductions *(General Permit Section I.C.2.a.(11)*)

An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle;

This estimate should cover the expected cost to the permittee. Permittees should have a strategy in place to achieve the (1) 5.0% reductions for the existing sources, (2) 5.0% reductions for the new sources that disturb one acre or greater and have an average impervious land cover condition greater than 16% for the design of post-development stormwater management facilities, and (3) any offsets for grandfathered projects that disturb one acre or greater and have an average impervious land cover condition greater than 16% for the design of post-development stormwater management facilities for this permit cycle. Permittees should also begin to plan for the full reductions that will be required by the end of three permit

cycles. Permittees are encouraged to be as detailed as possible as this information will be reviewed by the state when it reevaluates the amount of funding that will be available to aid localities with their programs.

10.a Public Comments on Draft Action Plan (GENERAL PERMIT REQUIREMENTS)

(General Permit Section I.C.2.a.(12))

An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.

The public comment process and period should be described, including how the process was advertised to the public.

10.b Public Comments on Draft Action Plan (PHASE I PERMIT REQUIREMENTS)

An opportunity for receipt and consideration of public comment on the draft Chesapeake Bay TMDL Action Plan; and, A list of all comments received as a result of public comment and any modifications made to the draft Chesapeake Bay TMDL Action Plan as a result of the public comments.

The public comment process and period should be described, including how the process was advertised to the public**.** The list should include comments received and the permittee's response to public comments.

APPENDIX I

Special condition for the Chesapeake Bay TMDL from the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems

C. Special condition for the Chesapeake Bay TMDL. The Commonwealth in its Phase I and Phase II Chesapeake Bay TMDL Watershed Implementation Plans (WIP) committed to a phased approach for MS4s, affording MS4 operators up to three full five-year permit cycles to implement necessary reductions. This permit is consistent with the Chesapeake Bay TMDL and the Virginia Phase I and II WIPs to meet the Level 2 (L2) scoping run for existing developed lands as it represents an implementation of 5.0% of L2 as specified in the 2010 Phase I WIP. Conditions of future permits will be consistent with the TMDL or WIP conditions in place at the time of permit issuance.

1. Definitions. The following definitions apply to this state permit for the purpose of the special condition for discharges in the Chesapeake Bay Watershed:

"Existing sources" means pervious and impervious urban land uses served by the MS4 as of June 30, 2009.

"New sources" means pervious and impervious urban land uses served by the MS4 developed or redeveloped on or after July 1, 2009.

"Pollutants of concern" or "POC" means total nitrogen, total phosphorous, and total suspended solids.

"Transitional sources" means regulated land disturbing activities that are temporary in nature and discharge through the MS4.

2. Chesapeake Bay TMDL planning.

a. In accordance with Table 1[10] in this section, the operator shall develop and submit to the department for its review and acceptance an approvable Chesapeake Bay TMDL Action Plan. Unless specifically denied in writing by the department, this plan becomes effective and enforceable 90 days after the date received by the department. The plan shall include:

(1) A review of the current MS4 program implemented as a requirement of this state permit including a review of the existing legal authorities and the operator's ability to ensure compliance with this special condition;

(2) The identification of any new modified legal authorities such as ordinances, state and other permits, orders, specific contract language, and interjurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition;

(3) The means and methods that will be utilized to address discharges into the MS4 from new sources;

(4) An estimate of the annual POC loads discharged from the existing sources as of June 30, 2009, based on the 2009 progress run. The operator shall utilize the applicable versions of Tables 2 a-d in the section based on the river basin to which the MS4 discharges by multiplying the total existing acres served by the MS4 on June 30, 2009, and the 2009 Edge of Stream (EOS) loading rate:

[10] See the General Permit for Table 1

Table 2 a: Calculation Sheet for Estimating Existing Source Loads for the James River Basin (* Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen		9.39	
Regulated Urban Pervious			6.99	
Regulated Urban Impervious	Phosphorus		1.76	
Regulated Urban Pervious			0.5	
Regulated Urban Impervious	Total Suspended Solids		676.94	
Regulated Urban Pervious			101.08	

Table 2 b: Calculation Sheet for Estimating Existing Source Loads for the Potomac River Basin (* Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen		16.86	
Regulated Urban Pervious			10.07	
Regulated Urban Impervious	Phosphorus		1.62	
Regulated Urban Pervious			0.41	
Regulated Urban Impervious	Total Suspended Solids		1,171.32	
Regulated Urban Pervious			175.8	

Table 2 c: Calculation Sheet for Estimating Existing Source Loads for the Rappahannock River Basin (* Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen		9.38	
Regulated Urban Pervious			5.34	
Regulated Urban Impervious	Phosphorus		1.41	
Regulated Urban Pervious			0.38	
Regulated Urban Impervious	Total Suspended Solids		423.97	
Regulated Urban Pervious			56.01	

Table 2 d: Calculation Sheet for Estimating Existing Source Loads for the York River Basin (* Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen		7.31	
Regulated Urban Pervious			7.65	
Regulated Urban Impervious	Phosphorus		1.51	
Regulated Urban Pervious			0.51	
Regulated Urban Impervious	Total Suspended Solids		456.68	
Regulated Urban Pervious			72.28	

(5) A determination of the total pollutant load reductions necessary to reduce the annual POC loads from existing sources utilizing the applicable versions of Tables 3 a-d in this section based on the river basin to which the MS4 discharges. This shall be calculated by multiplying the total existing acres served by the MS4 by the first permit cycle required reduction in loading rate. For the purposes of this determination, the operator shall utilize those existing acres identified by the 2000 U.S. Census Bureau urbanized area and served by the MS4.

Table 3 a: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the James River Basin (*Based On Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)	Total Reduction Required First Permit Cycle (lbs/yr)[11]
Regulated Urban Impervious	Nitrogen		0.04	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		6.67	
Regulated Urban Pervious			0.44	

[11] Tables 3a-d replicated in this Appendix are consistent with the tables that appear in the permit. Permittees should note that the Total Reduction's required in the permit represent lbs/yr.

Table 3 b: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the Potomac River Basin
(*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)	Total Reduction Required First Permit Cycle (lbs/yr)[8]
Regulated Urban Impervious	Nitrogen		0.08	
Regulated Urban Pervious			0.03	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.001	
Regulated Urban Impervious	Total Suspended Solids		11.71	
Regulated Urban Pervious			0.77	

Table 3 c: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the Rappahannock River Basin
(*Based On Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)	Total Reduction Required First Permit Cycle (lbs/yr)[8]
Regulated Urban Impervious	Nitrogen		0.04	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		4.24	
Regulated Urban Pervious			0.25	

Table 3 d: Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the York River Basin
(*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)	Total Reduction Required First Permit Cycle (lbs/yr)[8]
Regulated Urban Impervious	Nitrogen		0.03	
Regulated Urban Pervious			0.02	
Regulated Urban Impervious	Phosphorus		0.01	
Regulated Urban Pervious			0.002	
Regulated Urban Impervious	Total Suspended Solids		4.60	
Regulated Urban Pervious			0.32	

(6) The means and methods, such as management practices and retrofit programs that will be utilized to meet the required reductions included in subdivision 2 a (5) of this subsection, and a schedule to achieve those reductions. The schedule should include annual benchmarks to demonstrate the ongoing progress in meeting those reductions;
(7) The means and methods to offset the increased loads from new sources initiating construction between July 1, 2009, and June 30, 2014, that disturb one acre or greater as a result of the utilization of an average land cover condition greater than 16% impervious cover for the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 5.0% of the calculated increased load from these new sources during the permit cycle.
(8) The means and methods to offset the increased loads from projects as grandfathered in accordance with 9VAC25-870-48, that disturb one acre or greater that begin construction after July 1, 2014, where the project utilizes an average land cover condition greater than 16% impervious cover in the design of post-development stormwater management facilities. The operator shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids.
(9) The operator shall address any modification to the TMDL or watershed implementation plan that occurs during the term of this state permit as part of its permit reapplication and not during the term of this state permit

Table 4: Ratio of Phosphorous Loading Rate to Nitrogen and Total Suspended Solids Loading Rates for Chesapeake Bay Basins

Ratio of Phosphorous to Other POCs (Based on All Land Uses 2009 Progress Run)	Phosphorous Loading Rate (lbs/acre)	Nitrogen Loading Rate (lbs/acre)	Total Suspended Solids Loading Rate (lbs/acre)
James River Basin	1.0	5.2	420.9
Potomac River Basin	1.0	6.9	469.2
Rappahannock River Basin	1.0	6.7	320.9
York River Basin	1.0	9.5	531.6

(10) A list of future projects and associated acreage that qualify as grandfathered in accordance with 9VAC25-870-48;

(11) An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle; and

(12) An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan.

b. As part of development of the Chesapeake Bay TMDL Action Plan, the operator may consider:

(1) Implementation of BMPs on unregulated lands provided any necessary baseline reduction is not included toward meeting the required reduction in this permit;

(2) Utilization of stream restoration projects, provided that the credit applied to the required POC load reduction is prorated based on the ratio of regulated urban acres to total drainage acres upstream of restored area;

(3) Establishment of a memorandum of understanding (MOU) with other MS4 operators that discharge to the same of adjacent eight digit hydrologic unit within the same basin to implement BMPs collectively. The MOU shall include a mechanism for dividing the POC reductions created by BMP implementation between the cooperative MS4s;

(4) Utilization of any pollutant trading or offset program in accordance with 10.1-603.15:1 et seq. of the Code of Virginia, governing trading and offsetting;

(5) A more stringent average land cover condition based on less than 16% impervious cover for new sources initiating construction between July 1, 2009, and June 30, 2014, and all grandfathered projects where allowed by law; and

(6) Any BMPs installed after June 30, 2009, as part of a retrofit program may be applied towards meeting the required load reductions provided any necessary baseline reductions are not included.

3. Chesapeake Bay TMDL Action Plan implementation. The operator shall implement the TMDL Action Plan according to the schedule therein. Compliance with this requirement represents adequate progress for this state permit term towards achieving TMDL waste load allocation consistent with the assumptions and requirement of the TMDL. For the purposes of this permit, the implementation of the following represents implementation to the maximum extent practicable and demonstrated adequate progress:

a. Implementation of nutrient management plans in accordance with the schedule identified in the minimum control measure in Section II related to pollution prevention/good housekeeping for municipal operations;

b. Implementation of the minimum control measure in Section II related to construction site stormwater runoff control in accordance with this state permit shall address discharges from transitional sources;

c. Implementation of the means and methods to address discharges from new sources in accordance with the minimum control measure in Section II related to post-construction stormwater management in new development and development of prior developed lands and in order to offset 5.0% of the total increase in POC loads from grandfathered projects initiating construction after July 1, 2014, must be offset prior to completion of the project; and

d. Implementation of means and methods sufficient to meet the required reductions of POC loads from existing sources in accordance with the Chesapeake Bay TMDL Action Plan.

APPENDIX II – MEETING SPECIAL CONDITION REQUIREMENT 7 AND/OR 8

Special Condition Requirements 7 (GP Section I.C.2.a.(7)) and 8 (GP Section I.C.2.a.(8)) apply to permittees that (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) have allowed projects to be built with an impervious land cover condition greater than 16% for the design of post-development stormwater management facilities through a "fee-in-lieu of" or similar program. The reductions required under these sections of the Special Condition are to offset *increased* loads from new sources and must be made *in addition* to those required for existing conditions as of June 30, 2009 (GP Section I.C.2.a.(6)).

For projects that initiate construction between July 1, 2009 and June 30, 2014 subject to Special Condition Requirement 7 (GP Section I.C.2.a.(7)), permittees must offset 5.0% of the **increased** POC loads from those projects ~~during~~ by the end of ~~this~~ the permit cycle. For projects that are grandfathered in accordance with 9VAC26-870-48 and initiate construction after July 1, 2014 subject to Special Condition Requirement 8 (GP Section I.C.2.a.(8)), permittees must offset the entire increased load prior to completion of the project.

These projects are subject to Technical Criteria II C under the VSMP regulations. If permittees use the technology-based criteria under 9VAC25-870-96.C, no additional reductions are required under the Special Condition beyond those for the existing conditions as of June 30, 2009 under General Permit Section I.C.2.a.(6). This is because the technology based criteria assumes as average land cover condition of 16% for the design of post-development stormwater management facilities.

Permittees using the performance-based criteria under 9VAC25-870-96.B may have projects that require additional reductions under General Permit Section I.C.2.a.(7) or I.C.2.a.(8). The VSMP regulations organize the "performance-based criteria" into "four applicable land development situations." For clarity, this Appendix uses the same "situation" framework to explain when additional reductions are required for "new sources" under the Special Condition.

This Appendix is organized by "situation." Under each "situation" header the following information is provided:

1. Each "situation," as is described in 9VAC-25-870-96.B of the VSMP regulations,
2. The VSMP requirements for each performance-based criteria "situation," and;
3. An example diagram and the reduction requirements for each "situation" beyond those required under Section I.C.2.a.(6) of the general permit for each of the following project types:
    a. Redevelopment with an Average Impervious Land Cover Condition of 16% or Less
    b. Redevelopment with an Average Impervious Land Cover Condition Greater than 16%
    c. New Development with an Average Impervious Land Cover Condition of 16% or Less
    d. New Development with an Average Impervious Land Cover Condition Greater than 16%

NOTE: In some of these "situations" meeting the VSMP requirements will result in POC reductions. If that is the case, permittees may take credit for those reductions on prior developed lands and apply those credits to their 2009 baseline reductions under Special Condition Requirement 6 (GP Section I.C.2.a.(6)). Where applicable, these instances are indicated throughout this section. They are also addressed in Appendix V.K~~J~~.

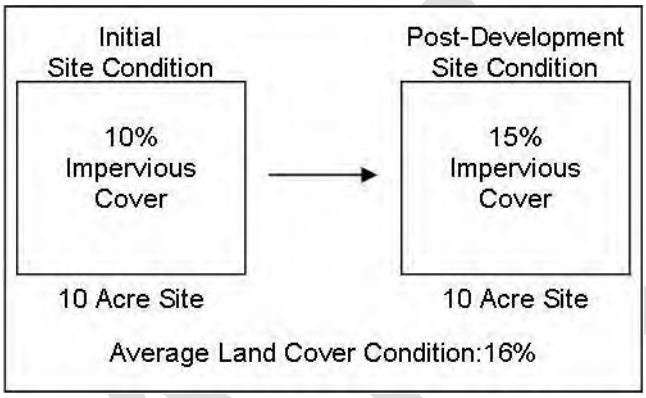
SITUATION 1

Land disturbing activities where the existing percent impervious cover is less than or equal to the average land cover condition and the proposed improvements will create a total percent impervious cover which is less than the average land cover condition.

VSMP Requirement: No reduction in the after disturbance pollutant discharge is required.

Special Condition Requirements*:*

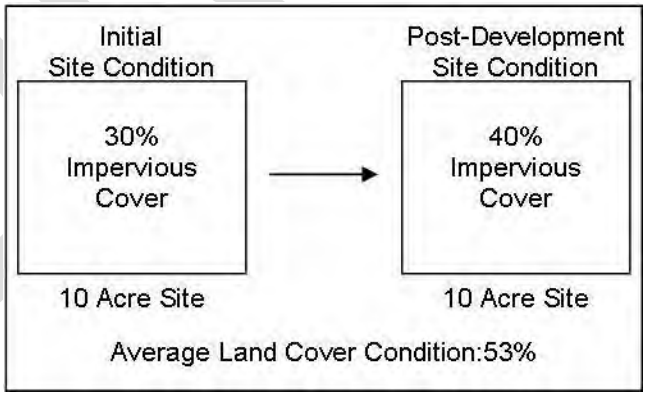
(a) *Redevelopment with an Average Impervious Land Cover Condition of 16% or Less:*



Special Condition Requirement 7: No additional reductions are required for this project type and situation because the average land cover condition is less than 16%.

Special Condition Requirement 8: No additional reductions are required for this project type and situation because the average land cover condition is less than 16%.

(b) *Redevelopment with an Average Impervious Land Cover Condition Greater than 16%:*

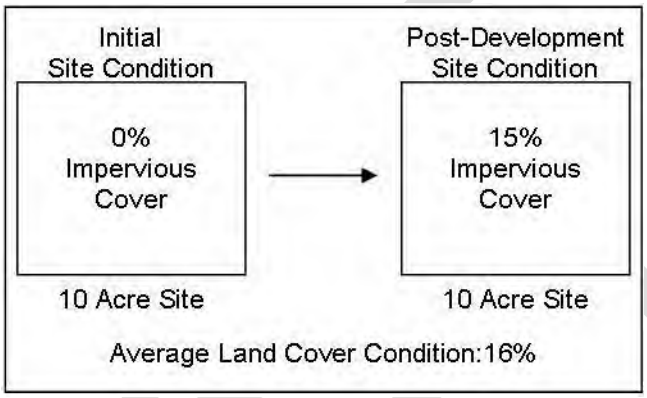


Special Condition Requirement 7: If construction on the project is initiated between July 1, 2009 and June 30, 2014 the permittee must create reductions *in addition* to those required by

Special Condition Requirement 6 (GP Section I.C.2.a.(6)). In this instance, the permittee must offset 5.0% of the incremental[12] increased load from the impervious cover change.

Special Condition Requirement 8: If the project is grandfathered in accordance with 9VAC25-870-48 and construction is initiated after July 1, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. In this instance, the permittee must offset the entire incremental increased load from the impervious cover change prior to completion of the project.

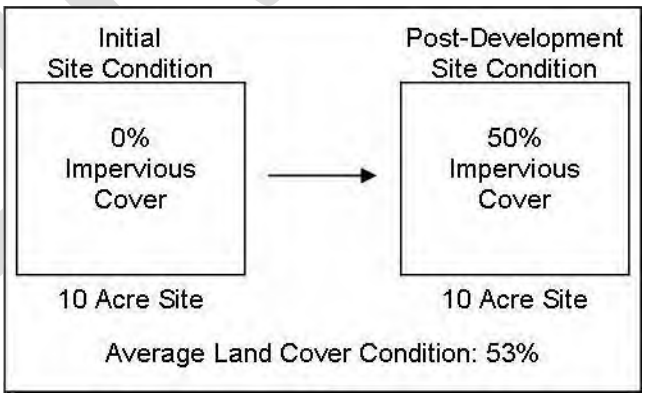
(c) *New Development with an Average Impervious Land Cover Condition of 16% or Less:*



Special Condition Requirement 7: No additional reductions are required for this project type and situation because the average land cover condition is less than 16%.

Special Condition Requirement 8: No additional reductions are required for this project type and situation because the average land cover condition is less than 16%.

(d) *New Development with an Average Impervious Land Cover Condition Greater than 16%*



Special Condition Requirement 7: If construction on the project is initiated between July 1, 2009 and June 30, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)). In this instance, the permittee

[12] Throughout this section incremental refers to the difference between the initial site impervious cover and the post-development site's impervious cover.

must offset 5.0% of the incremental increased load from the impervious cover change, down to the average land cover condition (50% impervious cover load – 16% impervious cover load).

Special Condition Requirement 8: If the project is grandfathered in accordance with 9VAC25-870-48 and construction is initiated after July 1, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. In this instance, the permittee must offset the entire incremental increased load from the impervious cover change, down to the average land cover condition (50% Impervious Cover – 16% Impervious Cover) prior to completion of the project.

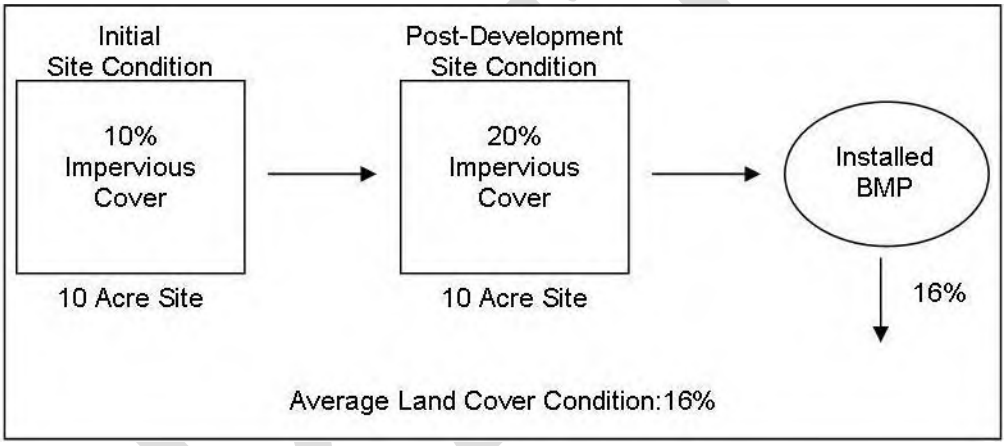
SITUATION 2

Land disturbing activities where the existing percent impervious cover is less than or equal to the average land cover condition and the proposed improvements will create a total percent impervious cover which is greater than the average land cover condition.

VSMP Requirement: The pollutant discharge after disturbance shall not exceed the existing pollutant discharge based on the average land cover condition. If the post-development impervious land cover condition exceeds the average land cover condition, BMPs must be installed on site to offset those increased loads using the techniques described in the Virginia Stormwater Management Handbook, which can be found on DEQs website.

Special Condition Requirement:

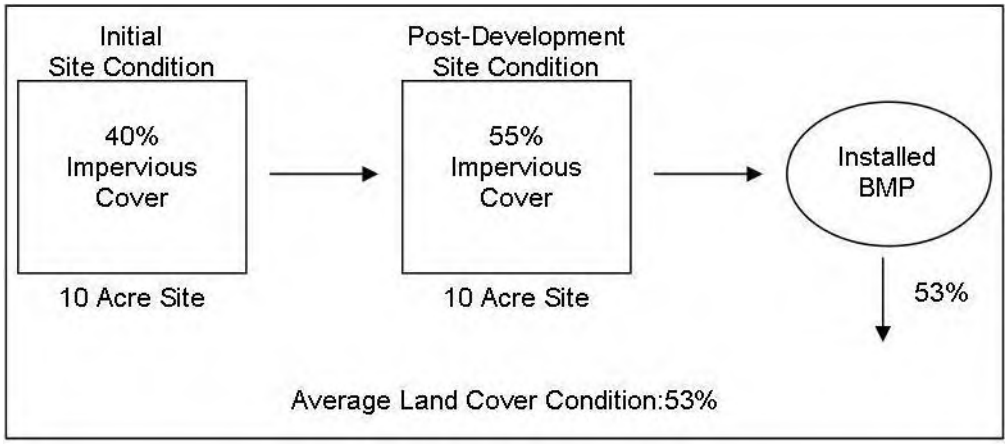
(a) *Redevelopment with an Average Impervious Land Cover Condition of 16% or Less:*



Special Condition Requirement 7: No additional reductions beyond those provided by the "Installed BMP" are necessary because the load draining from the site is equivalent to the load draining from a site with a 16% land cover condition.

Special Condition Requirement 8: No additional reductions beyond those provided by the "Installed BMP" are necessary because the load draining from the site is equivalent to the load draining from a site with a 16% land cover condition.

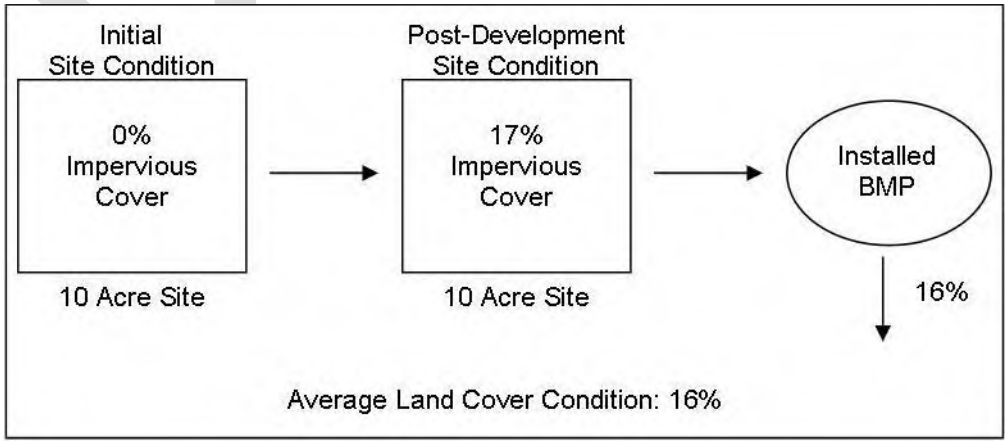
(b) *Redevelopment with an Average Impervious Land Cover Condition Greater than 16%*



Special Condition Requirement 7: If construction on the project is initiated between July 1, 2009 and June 30, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. The "Installed BMP" meets the VSMP requirements, since it offsets the additional load to the Average Land Cover Condition. To meet Special Condition Requirement 7 the permittee must determine the remaining incremental load increase from the redevelopment project (53% impervious cover load – 40% impervious cover load). ~~During~~ By the end of the first permit cycle, the permittee must offset 5.0% of that load.

Special Condition Requirement 8: If the project is grandfathered in accordance with 9VAC25-870-48 and construction is initiated after July 1, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. The "Installed BMP" meets the VSMP requirements, since it offsets the additional load to the Average Land Cover Condition. To meet Special Condition Requirement 8 the permittee must determine the remaining incremental load increase from the redevelopment project (53% impervious cover load – 40% impervious cover load). The permittee must offset the entire load prior to completion of the project.

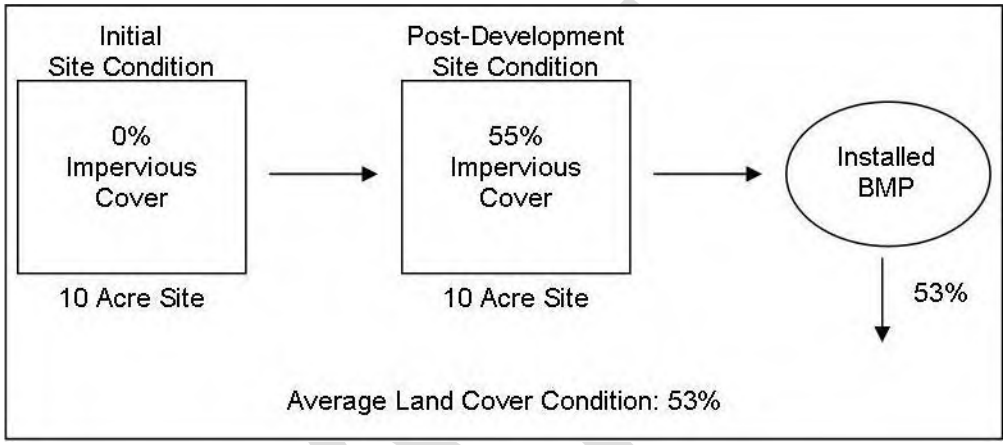
(c) *New Development with an Average Impervious Land Cover Condition of 16% or Less*



Special Condition Requirement 7: No additional reductions beyond those provided by the "Installed BMP" are necessary because the load draining from the site is equivalent to the load draining from a site with a 16% land cover condition.

Special Condition Requirement 8: No additional reductions beyond those provided by the "Installed BMP" are necessary because the load draining from the site is equivalent to the load draining from a site with a 16% land cover condition.

(d) *New Development with an Average Impervious Land Cover Condition Greater than 16%*



Special Condition Requirement 7: If construction on the project is initiated between July 1, 2009 and June 30, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. The "Installed BMP" meets the VSMP requirements, since it offsets the additional load to the Average Land Cover Condition. To meet Special Condition Requirement 7 the permittee must determine the remaining incremental load increase from the redevelopment project, down to the 16% Average Land Cover Condition (53% impervious cover load – 16% impervious cover load). ~~During~~ By the end of the first permit cycle, the permittee must offset 5.0% of that load.

Special Condition Requirement 8: If the project is grandfathered in accordance with 9VAC25-870-48 and construction is initiated after July 1, 2014 the permittee must create reductions *in addition* to those required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)).. The "Installed BMP" meets the VSMP requirements, since it offsets the additional load to the Average Land Cover Condition. To meet Special Condition Requirement 8 the permittee must determine the remaining incremental load increase from the redevelopment project (53% impervious cover load – 16% impervious cover load). The permittee must offset the entire incremental load prior to completion of the project.

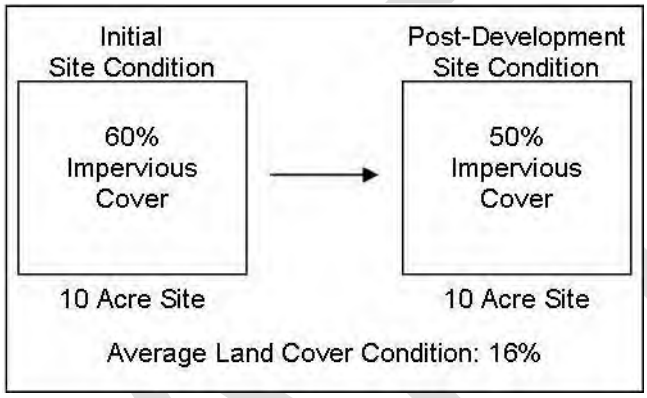
SITUATION 3

Land disturbing activities where the existing percent impervious cover is greater than the average land cover condition.

VSMP Requirement: The pollutant discharge after development shall not exceed 1) the pollutant discharge based on existing conditions less 10%; or 2) the pollutant discharge based on the average land cover condition, whichever is greater.

Special Condition Requirement:

(a) *Redevelopment with an Average Impervious Land Cover Condition of 16% or Less*

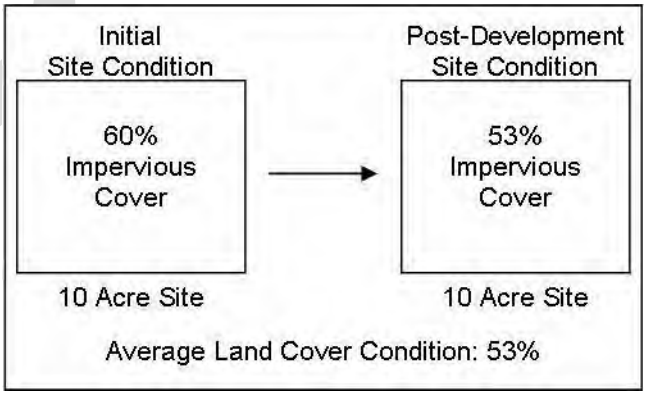


Special Condition Requirement 7: No additional reductions are required because there has not been an *increase* in the load draining from the site.

Special Condition Requirement 8: No additional reductions are required because there has not been an *increase* in the load draining from the site.

NOTE: The permittee may take credit for the 10% reductions and apply it to the existing source reductions required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)). See Appendix V.K~~J~~ for additional information concerning credits for redevelopment.

(b) *Redevelopment with an Average Impervious Land Cover Condition Greater than 16%*



Special Condition Requirement 7: No additional reductions are required because there was *no increase* in loads from the post developed site.

Special Condition Requirement 8: No additional reductions are required because there was *no increase* in loads from the post developed site.

NOTE: The permittee may take credit for the 7.0% reductions and apply it to the existing source reduction required by Special Condition Requirement 6 (GP Section I.C.2.a.(6)). See Appendix V.K~~J~~ for additional information concerning credits for redevelopment.

(c) *New Development with an Average Impervious Land Cover Condition of 16% or Less*
This Situation does not apply to new development.

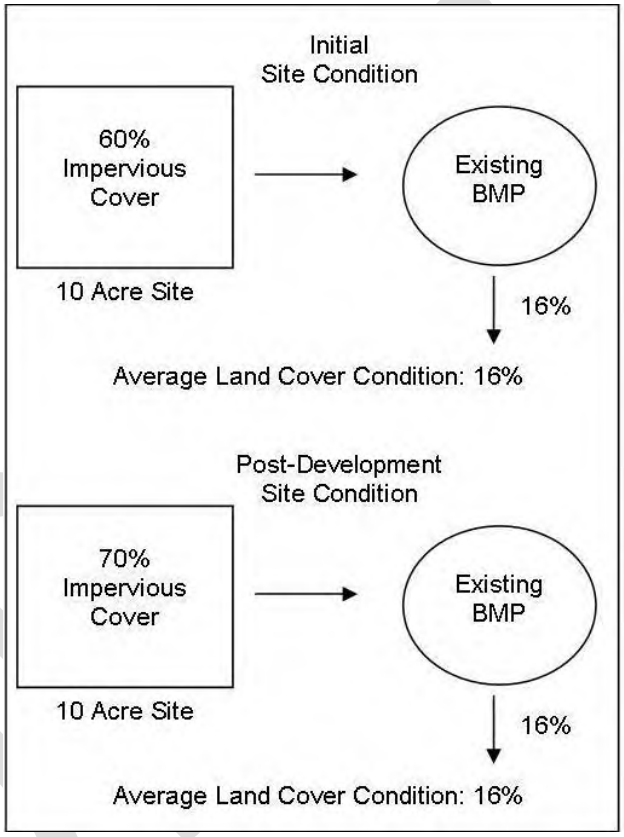
(d) *New Development with an Average Impervious Land Cover Condition Greater than 16%*
This Situation does not apply to new development.

SITUATION 4

Land disturbing activities where the existing percent impervious cover is served by an existing stormwater management BMP(s) that addresses water quality.

VSMP Requirement: The pollutant discharge after disturbance shall not exceed the existing pollutant discharge based on the existing percent impervious cover while served by the existing BMP. The existing BMP shall be shown to have been designed and constructed in accordance with proper design standards and specifications, and to be in proper functioning condition.

Special Condition Requirement:



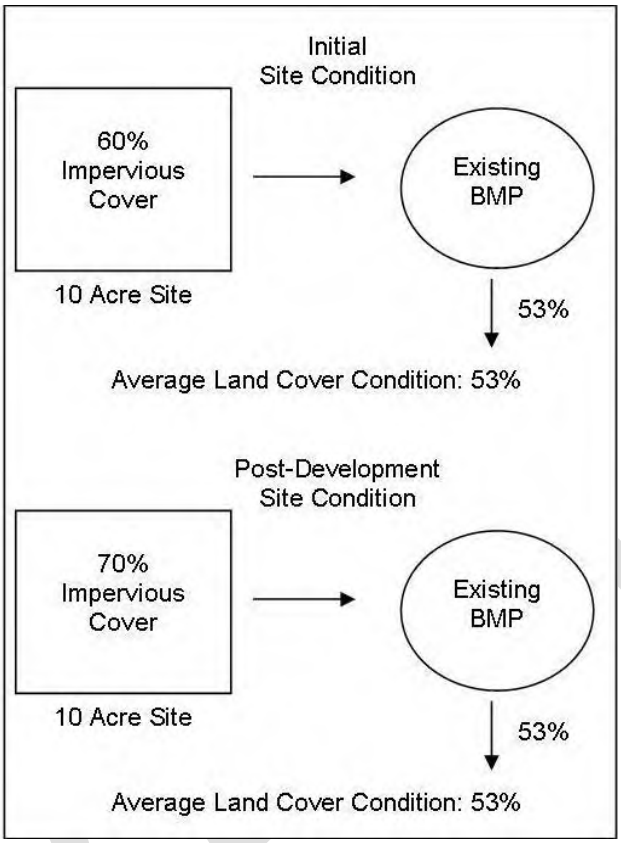
The site drains to an existing stormwater BMP before discharging to an impaired water body. The pollutant load discharged to the receiving stream from the regional BMP is less than or equal to load from a site with an average land cover condition of 16 percent. If the BMP is overdesigned for the current site, it may be possible for redevelopment to result in an increase in impervious cover on the site, but not result in an increased load reaching the stream. If that is the case, additional reductions do not need to be made.

(a) *Redevelopment with an Average Impervious Land Cover Condition of 16% or Less*

Special Condition Requirement 7: No additional reductions are required because the load draining from the BMP to the receiving water body does not increase.

Special Condition Requirement 8: No additional reductions are required because the load draining from the BMP to the receiving water body does not increase.

(b) *Redevelopment with an Average Impervious Land Cover Condition Greater than 16%*



The site drains to an existing stormwater BMP before discharging to an impaired water body. The pollutant load discharged to the receiving stream from the regional BMP is less than or equal to load from a site with an average land cover condition of 53 percent. If the BMP is overdesigned for the current site, it may be possible for redevelopment to result in an increase in impervious cover on the site, but not result in an increased load reaching the stream. If that is the case, additional reductions do not need to be made.

Special Condition Requirement 7: No additional reductions are required because the load draining from the BMP to the receiving water body does not increase.

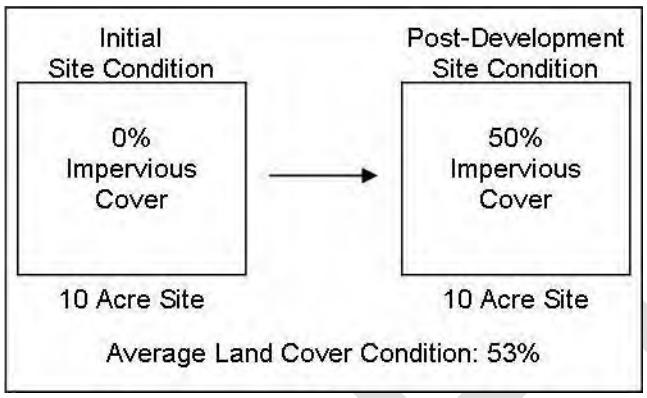
Special Condition Requirement 8: No additional reductions are required because the load draining from the BMP to the receiving water body does not increase.

(c) *New Development with an Average Impervious Land Cover Condition of 16% or Less*
This Situation does not apply to new development.

(d) *New Development with an Average Impervious Land Cover Condition Greater than 16%*
This Situation does not apply to New Development.

EXAMPLE II.1 – Site Specific Calculation to Meet Special Condition Requirement 7 or 8

A permittee in the James River Basin that adopted an average land cover condition of 53% under the Chesapeake Bay Preservation Act needs to calculate the additional reductions required under Special Condition Requirement 7 (GP Section I.C.2.a.(7)) for a 10 acre new development project that initiates construction between July 1, 2009 and June 30, 2014. Once completed, the project will have an average land cover condition of 50%, which is less than the localities adopted average land cover condition.



Step 1: Site Condition as of June 30, 2009 Calculation

The permittee must incorporate the site conditions as of June 30, 2009 into the acreage calculation under Special Condition Requirement 6 (GP Section I.C.2.a.(6)). Once the "existing condition" required reductions are determined using the tables they do not need to be recalculated. In this example, all 10 acres of the pre-development site are pervious regulated acres (there are no forested acres on site).

Step 2: Identifying Additional Reductions under Special Condition 7 or 8

Next the permittee must determine if the project is subject to additional reduction requirements. Referencing Appendix II.1 of this guidance document, the permittee identifies that this project falls under Situation 1.(d). In accordance with Special Condition Requirement 7 (GP Section I.C.2.a.(7)) the permittee must offset 5.0% of the incremental increased load from the impervious cover change down to the statewide average land cover condition of 16% by the end of~~during~~ this permit cycle *in addition* to the reductions required under ~~Special Condition 6~~GP Section I.C.2.a.(6).

Step 3: Calculating Additional Required Reductions

The post-development 50% impervious land cover condition has an associated total phosphorous loading of 1.14 lbs TP/ac/yr (calculated using the Simple Method). To calculate the additional offsets that will be necessary for the site the permittee should subtract the phosphorous loading associated with a 16% average impervious land cover condition (0.45 lbs TP/ac/yr) from the l~~calculated l~~oad calculated using the simple method for the higher average land cover condition:

1.14 lbs TP/ac/yr - 0.45 lbs TP/ac/yr = 0.69 lbs TP/ac/yr

~~During~~By the end of the first permit cycle, the permittee must offset 5.0% of this increased load:

0.69 lbs TP/ac/yr * .05 = 0.0345 lbs TP/ac/yr

Since the project is a 10 acre site, the total pounds that must be offset for this site for this permit cycle is:

10 acre site * 0.0345 lbs/ac/yr = 0.345 lbs TP/yr

The permittee must offset 0.345 lbs TP/yr for this site ~~during~~ by the end of the~~is~~ permit term. ~~During~~ By the end of the next permit term the permittee will need to offset an additional 35% of the increased load from this project and it is expected that by the end of the third permit cycle the increased loading from these sites will be fully offset.

To calculate the TN loading rate reduction required ~~during~~ by the end of this MS4 permit cycle and TSS loading rate reduction required ~~during~~ by the end of this MS4 permit cycle, the permittee will need to use the ratio table provided in the permit. For the James River Basin, the POC ratios are those shown in GP Section I.C.2, *Table 4*, an excerpt of which is provided below (*Table II.1*):

Table II.1 – Ratio of Phosphorous Loading Rate to Nitrogen and Total Suspended Solids Loading Rates for the James River Basin[13]

Ratio of Phosphorous to Other POCs (Based on All Land Uses 2009 Progress Run)	Phosphorous Loading Rate (lbs/ac)	Nitrogen Loading Rate (lbs/ac)	Total Suspended Solids Loading Rate (lbs/ac)
James River Basin	1.0	5.2	420.9

To calculate the additional reductions required for TN for this project the permittee first needs to use the conversion table to calculate the lbs TN/ac/yr that must be reduced as a result of 50% impervious land cover condition:

$$.0345 \text{ lbs TP/ac/yr} * \frac{5.2 \text{ lbs TN/ac}}{1.0 \text{ lbs TP/ac}} = 0.179 \text{ lbs TN/ac/yr}$$

The permittee should then calculate the TN offsets that must be made for this 10 acre project:

$$0.179\cancel{4} \text{ lbs TN/ac/yr} * 10 \text{ acres} = 1.79 \text{ lbs TN/yr}$$

Similar calculations must be performed to determine the offsets for total suspended solids loading rate. Again, the permittee first needs to use the conversion table provided in the permit to determine the lbs TSS/ac/yr that must be reduced as a result of 50% impervious land cover condition.

$$0.0345 \text{ lbs TP/ac/yr} * \frac{420.9 \text{ lbs TSS/ac}}{1.0 \text{ lbs TP/ac}} = 14.251 \text{ lbs TSS/ac/yr}$$

The permittee should then calculate the TSS offsets that must be made for this 10 acre project:

$$14.5211 \text{ lbs TSS/ac/yr} * 10 \text{ acres} = 145.21 \text{ lbs TSS/yr}$$

For this project, ~~during~~ by the end of the first permit cycle, the permittee must offset 0.345 lbs TP/yr, 1.79 lbs TN/yr, and 145.21 lbs TSS/yr. ~~During~~ By the end of the next permit term the permittee will need to

[13] Table and values for the James River Basin can be found in the General Permit or Appendix I of this document

offset an additional 35% of the increased load from this project and it is expected that by the end of the third permit cycle the increased loading from these sites will be fully offset.

NOTE: Permittees may report the impact of offsets required under Special Condition 7 and/or 8 to the Department in aggregate. However, the data and calculations performed to determine these numbers should be kept on hand.

EXAMPLE II.2[14] – Aggregate Accounting for Special Condition Requirement 7 ~~or 8~~

A permittee in the James River Basin had a fee-in-lieu of program in place through July 1, 2012. Due to the variability in the average land cover condition of projects built under this program, the permittee has decided to take an aggregate approach to addressing Special Condition ~~Requirement~~ 7. The permittee has 1000 acres of regulated land throughout their service area, which was 50% impervious and 50% pervious as of June 30, 2009. To estimate the POC reductions required under Special Condition Requirement 7, the permittee first needs to calculate the total POC loads as of June 30, 2009. The permittee should use the "2009 EOS Loading Rate" from Table 2a in the permit for this calculation:

Table II.2 – POC Loads as of June 30, 2009 (Pre-Development)

Subsource	Pollutant	Total Existing Acres Served by MS4 as of 06/30/09	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load as of 06/30/09 (lbs/yr)
Regulated Urban Impervious	Nitrogen	*500*	9.39	*4695*
Regulated Urban Pervious		*500*	6.99	*3495*
Regulated Urban Impervious	Phosphorus	*500*	1.76	*880*
Regulated Urban Pervious		*500*	0.5	*250*
Regulated Urban Impervious	Total Suspended Solids	*500*	676.94	*338,470*
Regulated Urban Pervious		*500*	101.08	*50,540*

As of July 1, 2014 the permittee determines using GIS resources that, as a result of "new sources," the proportion of regulated urban pervious acres to regulated urban impervious acres has changed. The permittee should determine the "post-development" loading rates as a result of the land use change. Again, the "2009 EOS Loading Rate" from Table 2a should be used for this calculation:

Table II.3 - Post-Development Conditions July 1, 2014

Subsource	Pollutant	Total Existing Acres Served by MS4 (07/01/14)	2009 EOS Loading Rate (lbs/acre/yr)	Estimated Total POC Load as of 07/01/14 (lbs/yr)
Regulated Urban Impervious	Nitrogen	*600*	9.39	*5634*
Regulated Urban Pervious		*400*	6.99	*2796*
Regulated Urban Impervious	Phosphorus	*600*	1.76	*1056*
Regulated Urban Pervious		*400*	0.5	*200*
Regulated Urban Impervious	Total Suspended Solids	*600*	676.94	*406,164*
Regulated Urban		*400*	101.08	*40,432*

[14] **NOTE**: This aggregate method does not differentiate between projects greater than or less than an acre nor does it account for average land use cover condition for the implementation of post-development stormwater management facilities. Instead it captures all changes in regulated urban impervious and regulated urban pervious loads. Permittees may submit alternative aggregate accounting strategies, but they must ensure that the submitted method captures all additional reductions required under Special Condition Requirement 7 (GP Section I.C.2.a.(7)).

Pervious				

The permittee should then calculate the difference between the post-development and pre-development land cover condition to estimate the Total Load Change (Regulated Urban Impervious Load Change + Regulated Urban Pervious Load Change).

Table II.4 – Total Load Change from "New Sources" between June 30, 2009 and July 1, 2014

Subsource	Pollutant	Estimated Total POC Load as of 07/01/14 (lbs/yr)	Estimated Total POC Load as of 06/30/09 (lbs/yr)	Load Change (lbs/yr)	Total Load Change (lbs/yr)
Regulated Urban Impervious	Nitrogen	*5634*	*4695*	939	
Regulated Urban Pervious		*2796*	*3495*	-699	240
Regulated Urban Impervious	Phosphorus	*1056*	*880*	176	
Regulated Urban Pervious		*200*	*250*	-50	126
Regulated Urban Impervious	Total Suspended Solids	*406,164*	*338,470*	67,694	
Regulated Urban Pervious		*40,432*	*50,540*	-10,108	57,586

The permittee should also take into account BMPs that were installed on site during the development or redevelopment process to meet other VSMP requirements. The POC loads treated by those BMPs should be subtracted from the Total Load Change.

Table II.5 – Net Load Change (Total Load Change – Reductions from implemented BMPs)

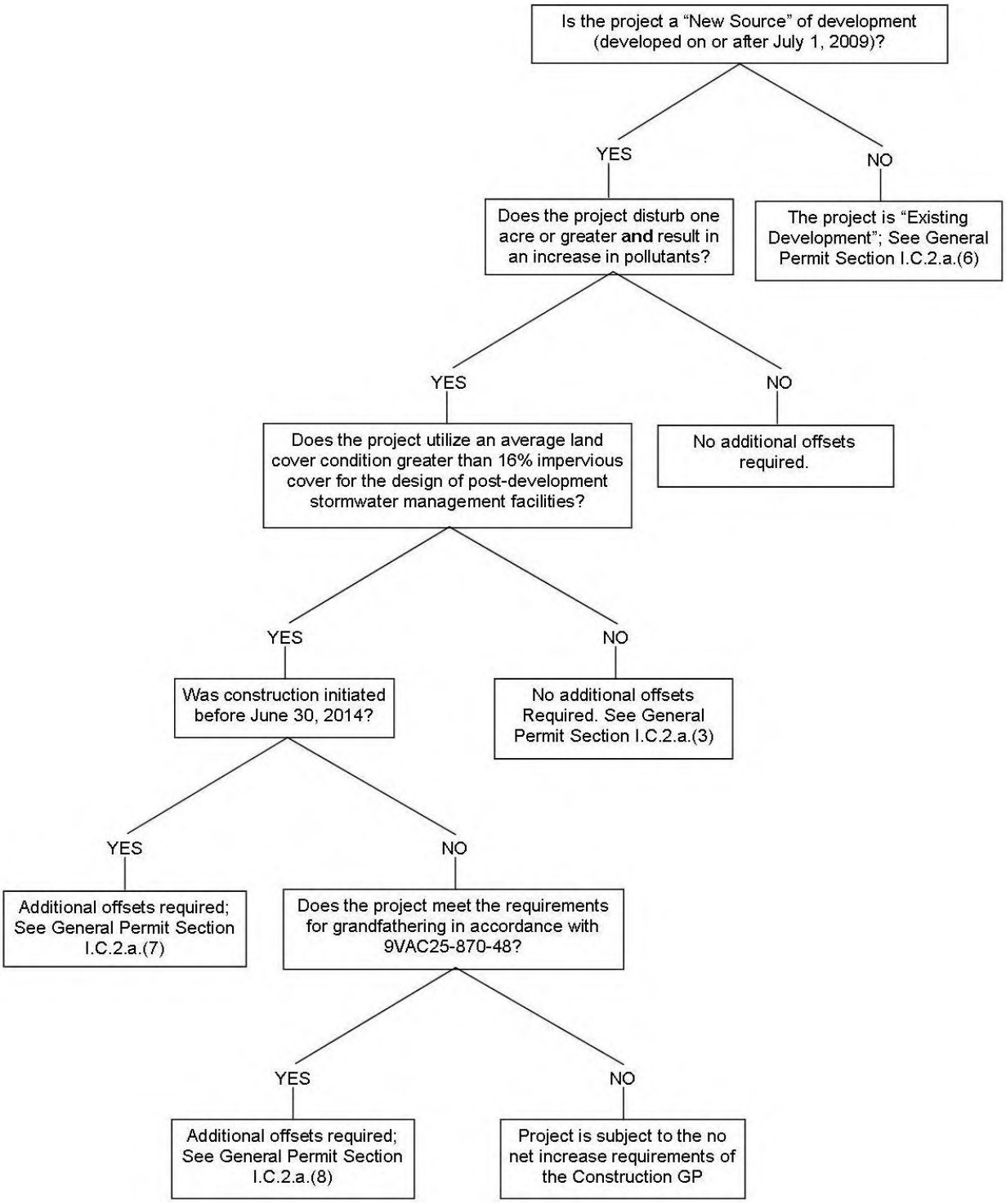
Pollutant	Total Load Change (lbs/yr)	Reductions from on-site BMPs (lbs/yr)	Net Load Change (lbs/yr)
Nitrogen	240	100	140
Phosphorus	126	25	101
Total Suspended Solids	57,586	20,000	37,586

The final column of Table II.5 represents the additional load from New Sources between June 30, 2009 and July 1, 2014 that must be offset. By the end of~~During~~ the first permit cycle, the permittee will need to offset 5.0% of the calculated "Net Load Change."

Pollutant	Net Load Change (lbs/yr)	Required Reduction during first permit cycle	Additional Reductions Required by the end of the~~during~~ first permit cycle (lbs/yr)
Nitrogen	140	0.05	7
Phosphorous	101	0.05	5.05
Total Suspended Solids	37,586	0.05	1879.3

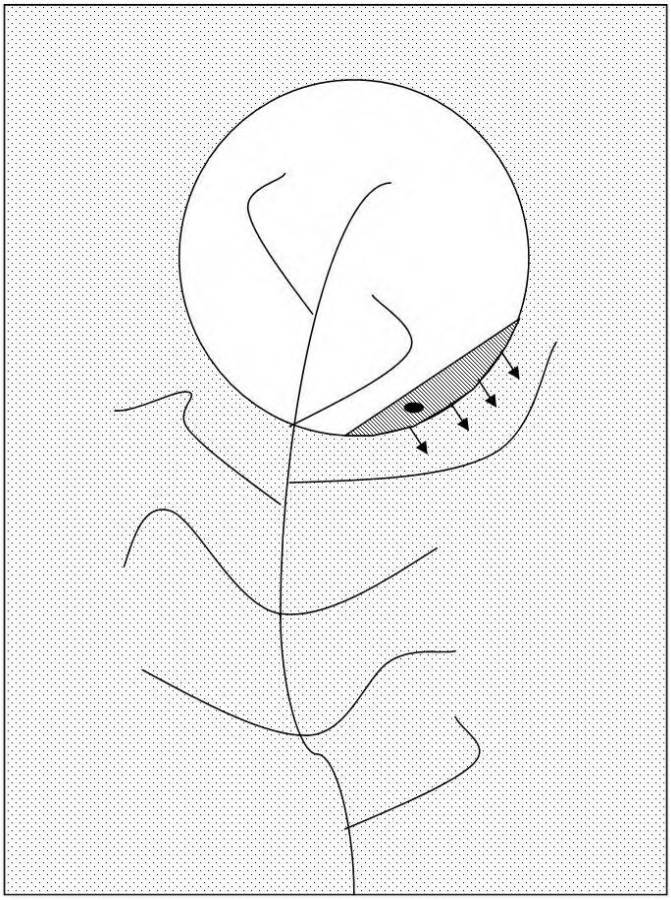
Although this was not the case in this example, if the total load change for any pollutant represents a reduction, the permittee may take credit for the difference and apply it towards the reduction requirements for existing sources.

APPENDIX III – PERMIT POC LOAD REDUCTION FLOW CHART



APPENDIX IV – MS4 BOUNDARY DIAGRAMS

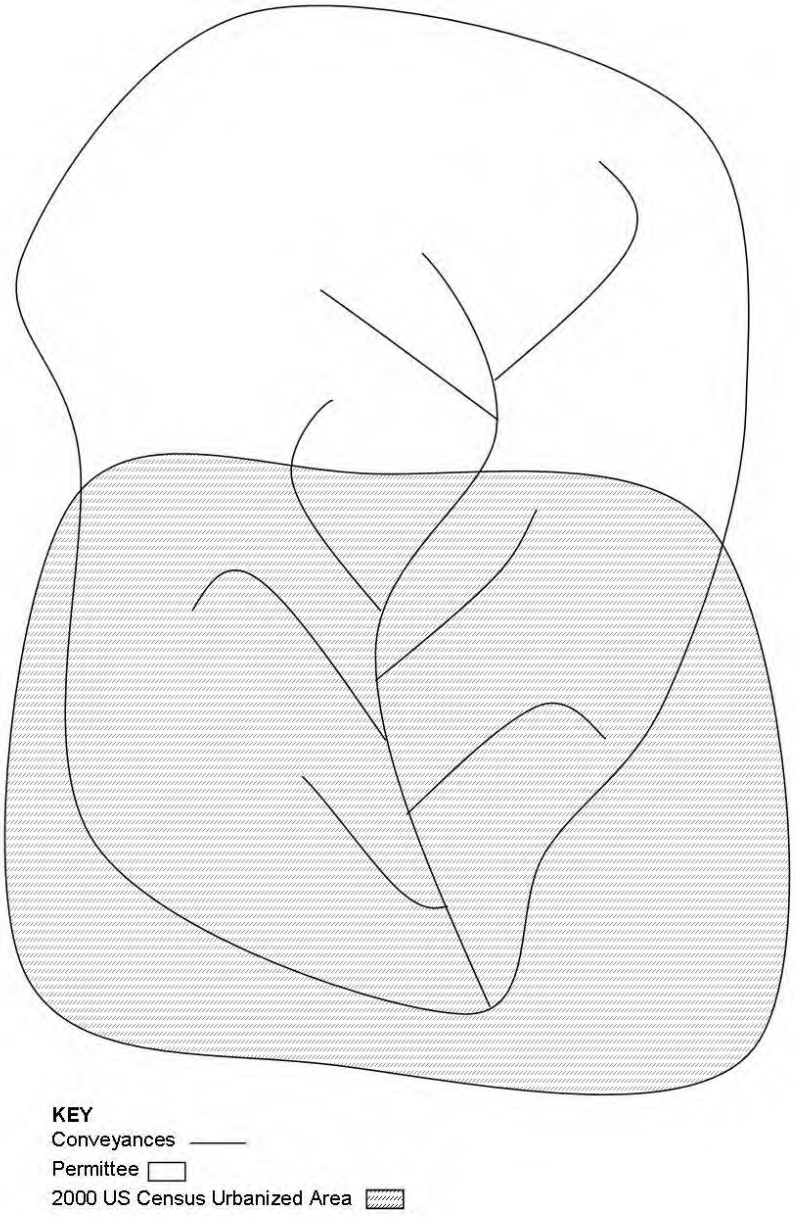
EXAMPLE IV.1 – OVERLAPPING DRAINAGE AREAS



In accordance with GP Section I.C.2.(5) permittees must determine the existing acres *served* by the MS4. The system's service area includes those acres that drain to the permittee's system. Permittee B is located within Permittee A's land area and both permittees are located entirely within a Census Designated Urbanized Area. A portion of Permittee B's land area drains, through sheetflow, to Permittee A's system. Although the shaded drainage area is located within Permittee B's jurisdiction, Permittee A is responsible for the POC loads draining from that land. Alternatives to this approach will be considered as long as all lands are accounted for in reduction calculations.

However, if Permittee B installs a BMP within the shaded Drainage Area, they will receive credit for reductions from the BMP. Regardless, it is highly recommended that permittee's work together to reduce POC loads in these instances.

EXAMPLE IV.2 – JURISDICTION EXTENDS BEYOND URBANIZED AREA



A portion of the Phase II permittee's system falls outside of the 2000 US Census Urbanized Area. The Phase II permittee is not responsible for any land area draining to the portion of their system that falls outside the Urbanized Area.

APPENDIX V – CALCULATION METHODOLOGIES

Appendix V.A – Structural BMPs, Methodology I – Virginia Stormwater Clearinghouse BMPs

Appendix V.B – Structural BMPs, Methodology II – Bay Program Retrofit Curves

Appendix V.C – Structural BMPs, Methodology III – Bay Program Established Efficiencies

Appendix V.D – Structural BMPs, Methodology IV – BMP Enhancements and Conversions

Appendix V.E – Structural BMPs, Methodology V – BMP Treatment Trains

Appendix V.F – ~~Land Use Changes~~Street Sweeping

Appendix V.G – Land Use Changes

Appendix V.~~G~~ H – Forest Buffers

Appendix V.I~~H~~ – Urban Stream Restoration

Appendix V.J~~I~~ – Urban Nutrient Management

Appendix V.K~~J~~ - Redevelopment

APPENDIX V.A – Virginia Stormwater Clearinghouse BMPs[15]

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

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

Practice Number	Practice	TN	TP
1	Rooftop Disconnection[13]	25% or 50%[1]	25% or 50%[1]
2	Sheetflow to Vegetated Filter or Conserved Open Space 1	25% or 50%[1]	25% or 50%[1]
	Sheetflow to Vegetated Filter or Conserved Open Space 2	50% or 75%[1]	50% or 75%[1]
3	Grass Channel	28%	23%
5	Vegetated Roof 1	45%	45%
	Vegetated Roof 2	60%	60%
6	Rainwater Harvesting[16]	Up to 90%	Up to 90%
7	Permeable Pavement 1	59%	59%
	Permeable Pavement 2	81%	81%
8	Infiltration 1	57%	63%
	Infiltration 2	92%	93%
9	Bioretention 1	64%	55%
	Bioretention 2	90%	90%
	Urban Bioretention	64%	55%
10	Dry Swale 1	55%	52%
	Dry Swale 2	74%	76%
11	Wet Swale 1	25%	20%
	Wet Swale 2	35%	40%
12	Filtering Practice 1	30%	60%
	Filtering Practice 2	45%	65%
13	Constructed Wetland 1	25%	50%
	Constructed Wetland 2	55%	75%
14	Wet Pond 1	30% (20%)[2]	50% (45%)[2]
	Wet Pond 2	40% (30%)[2]	75% (65%)[2]
15	Extended Detention Pond 1	10%	15%
	Extended Detention Pond 2	24%	31%

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

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

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

EXAMPLE V.A.1

A small Phase II MS4 with 1000 acres of regulated urban impervious surface and 1000 acres of regulated urban pervious surface is located in the James River Basin. The permittee is planning to implement a constructed wetland that will treat a 50 acre site that is 40% impervious surface and 60% pervious surface.

Prior to considering this project, the permittee has filled out Tables 2a and 3a in their permit, which are incorporated into this example for reference. The permittee will use the loading rates in Table 2a to determine the loads draining to the proposed BMP.

Calculation Sheet for Estimating Existing Source Loads for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)[1]	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	9.39	*9390*
Regulated Urban Pervious		*1000*	6.99	*6990*
Regulated Urban Impervious	Phosphorus	*1000*	1.76	*1760*
Regulated Urban Pervious		*1000*	0.5	*500*
Regulated Urban Impervious	Total Suspended Solids	*1000*	676.94	*676,940*
Regulated Urban Pervious		*1000*	101.08	*101,080*

[1]This loading rate can be found in Table 2 a of the General Permit

The second table(s) in the permit must be used to calculate the required reduction for the first permit cycle. This calculation will provide the necessary reductions for the first permit cycle in pounds:

Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)[1]	Total Reduction Required First Permit Cycle (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	0.04	*40*
Regulated Urban Pervious		*1000*	0.02	*20*
Regulated Urban Impervious	Phosphorus	*1000*	0.01	*10*
Regulated Urban Pervious		*1000*	0.002	*2*
Regulated Urban Impervious	Total Suspended Solids	*1000*	6.67	*6670*
Regulated Urban Pervious		*1000*	0.44	*440*

[1]This loading rate can be found in Table 3 a in the General Permit

Based on the calculations in the table, the permittee must achieve reductions of 60 lbs TN, 12 lbs TP, and 7110 lbs TSS within the first permit cycle. Although this table divides the loads by regulated impervious and regulated pervious, the efficiencies calculated using the curves are applied to the entire drainage area, not just its impervious acres. The MS4 intends to offset a portion of this load by installing a constructed wetland to treat a 50 acre site that is 40% impervious (20 acres) and 60% pervious (30 acres).

The BMP being installed meets all the design requirements for the Virginia Stormwater BMP Clearinghouse "Constructed Wetland #1," which has a TN reduction efficiency of 25% and a TP reduction efficiency of 50% (*Table V.A 1*). The BMP's efficiency can be translated into pounds by first calculating the site's POC loading without the BMP. Recall that the BMP is being installed to treat land that is 20 acres impervious and 30 acres pervious surface. The acres should be multiplied by the 2009 EOS loading rate for the appropriate basin (*Appendix I, Table 2a)*. For instance, to estimate the nitrogen reductions provided by the constructed wetland for the impervious surface:

$$20\ acres * 9.39\ lbs\ TN/ac/yr = 187.8\ lbs\ T/yr$$

and for pervious surface:

$$30\ acres * 6.99\ lbs\ TN/ac/yr = 209.7\ lbs\ TN/yr$$

These TN reduction values should be multiplied by the TN efficiency for a constructed wetland as provided in *Table V.A.1*.

$$187.8\ lbs\ TN/yr * 0.25 = 46.95\ lbs\ TN/yr$$

$$209.7\ lbs\ TN/yr * 0.25 = 52.43\ lbs\ TN/yr$$

Therefore, the total nitrogen reduction from the constructed wetland is:

$$46.95\ lbs\ TN/yr + 52.43\ lbs\ TN/yr = 99.38\ lbs\ TN/yr$$

With the installation of this BMP, the permittee has reduced its annual load of nitrogen by 99.38 lbs. With this BMP the permittee has met the reduction requirements for the first permit cycle for nitrogen. The reductions that are achieved for TP can be calculated using the same methodology. To calculate the reductions for TSS, see *Appendix V.B.*

APPENDIX V.B – Chesapeake Bay Program, Retrofit ~~Curves~~Curves/Equations

This credit calculation method should be used when a BMP cannot meet the Virginia Stormwater BMP Clearinghouse criteria. The *Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects* (October 2012) provided "Retrofit Curves" as an acceptable method for determining BMP efficiency. An FAQ published by the Bay Program in May 2013 indicated that the log curves in the October report be superseded by 5th order polynomial equations. The Expert Panel report curves were updated to reflect this change in January 2015. These equations may not provide the same efficiencies as the retrofit curves previously incorporated into this section of the guidance document. ~~To~~To use the updated retrofit equations or curves~~curves~~, the permittee must first estimate the runoff depth treated per impervious acre by the BMP. This can be done using the following equation:

$$RD = \frac{(RS)(12)}{IA}$$

Where

RD = Runoff Depth Treated (inches)
RS = Runoff Storage (acre-feet)
IA = Impervious Acres (acres)

Runoff Depth or Runoff Storage can be estimated by the engineer designing the BMP ~~or, for sediment, using the BMP appropriate "Runoff Reduction (cf)" cell from the DA tab in the Runoff Reduction Method spreadsheet for the BMPs that are in the Virginia Stormwater BMP Clearinghouse~~. **NOTE:** The previous version of this Guidance document stated that permittees could use the Runoff Reduction Method Spreadsheet to estimate a BMP's Runoff Storage for use in this equation. However, upon further review, it was determined that using the "Runoff Reduction" cell is not an appropriate method, as it results in the "runoff storage" being counted twice. ~~The appropriate spreadsheets may be found on the Department's website on the Stormwater Management Guidance page.~~

BMPs are categorized as either a Runoff Reduction (RR) Practice or a Stormwater Treatment (ST) Practice (*Table V.B.1)*. Once the runoff depth treated ("X~~x~~" ~~-axis~~) and BMP type are defined, the user will be able to estimate the total removal percentage using the ~~curves~~retrofit curves or equations. **NOTE: The retrofit equations and/or curves CANNOT be used for dry ponds or extended detention ponds.**

Table V.B.1 - BMP Characterization for Nutrient Curves

Runoff Reduction Practices (RR)	Stormwater Treatment Practices (ST)
Site Design/Non-Structural Practices	Constructed Practices
Landscape Restoration/Reforestation	Constructed Wetlands
Riparian Buffer Restoration	Filtering Practices (aka Constructed Filters, Sand Filters, Stormwater Filtering Systems)
Rooftop Disconnection (aka Simple Disconnection to Amended Soils, to a Conservation Area, to a Pervious Area, Non-Rooftop Disconnection)	Proprietary Practices (aka Manufactured BMPs)
Sheetflow to Filter/Open Space* (aka Sheetflow to Conservation Area, Vegetated Filter Strip)	Wet Ponds (aka Retention Basin)
All Environmental Site Design BMPS	Wet Swale
Constructed Practices	
Bioretention or Rain Garden (Standard or Enhanced)	
Dry Swale	
Expanded Tree Pits	
Grass Channels (w/ Soil Amendments, aka Bio-swale,	

Vegetated Swale)	
Green Roof (aka Vegetated Roof)	
Green Streets	
Infiltration (aka Infiltration Basin, Infiltration Bed, Infiltration Trench, Dry Well/Seepage Pit, Landscape Infiltration)	
Permeable Pavement (aka Porous Pavement)	
Rainwater Harvesting (aka Capture and Re-use)	
*May include a berm or a level spreader	

~~In order to calculate the pounds reduced by a given BMP, the permittee will need to multiply the BMP's efficiency (%) by the appropriate loading rate provided in the permit and acres treated (*See Example V.B.1)*~~

More information concerning the retrofit equation calculations~~curves~~ can be found in the Bay Program's:

- ~~*Frequently Asked Questions (FAQ) for Recently Approved Urban BMPs*~~, May 2013 at: http://www.chesapeakebay.net/channel_files/19172/attach_f-draft_faq_document__template.pdf

a~~A~~nd more information concerning the retrofit curves can be found in the Bay Program's:

- *Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects*, January~~October~~ 2012, at: http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2012/10/Final-CBP-Approved-Expert-Panel-Report-on-Stormwater-Retrofits-long_012015.pdf~~http://www.chesapeakebay.net/documents/Final_CBP_Approved_Expert_Panel_Report_on_Stormwater_Retrofits__long.pdf~~

The retrofit equations and curves are provided below:

Table V.B.2 – Retrofit Equations

TN	RR	$y = 0.0304x^5 - 0.2619x^4 + 0.9161x^3 - 1.6837x^2 + 1.7072x - 0.0091$
	ST	$y = 0.0239x^5 - 0.2058x^4 + 0.7198x^3 - 1.3229x^2 + 1.3414x - 0.0072$
TP	RR	$y = 0.0308x^5 - 0.2562x^4 + 0.8634x^3 - 1.5285x^2 + 1.501x - 0.013$
	ST	$y = 0.0152x^5 - 0.131x^4 + 0.4581x^3 - 0.8418x^2 + 0.8536x - 0.0046$
TSS	RR	$y = 0.0326x^5 - 0.2806x^4 + 0.9816x^3 - 1.8039x^2 + 1.8292x - 0.0098$
	ST	$y = 0.0304x^5 - 0.2619x^4 + 0.9161x^3 - 1.6837x^2 + 1.7072x - 0.0091$

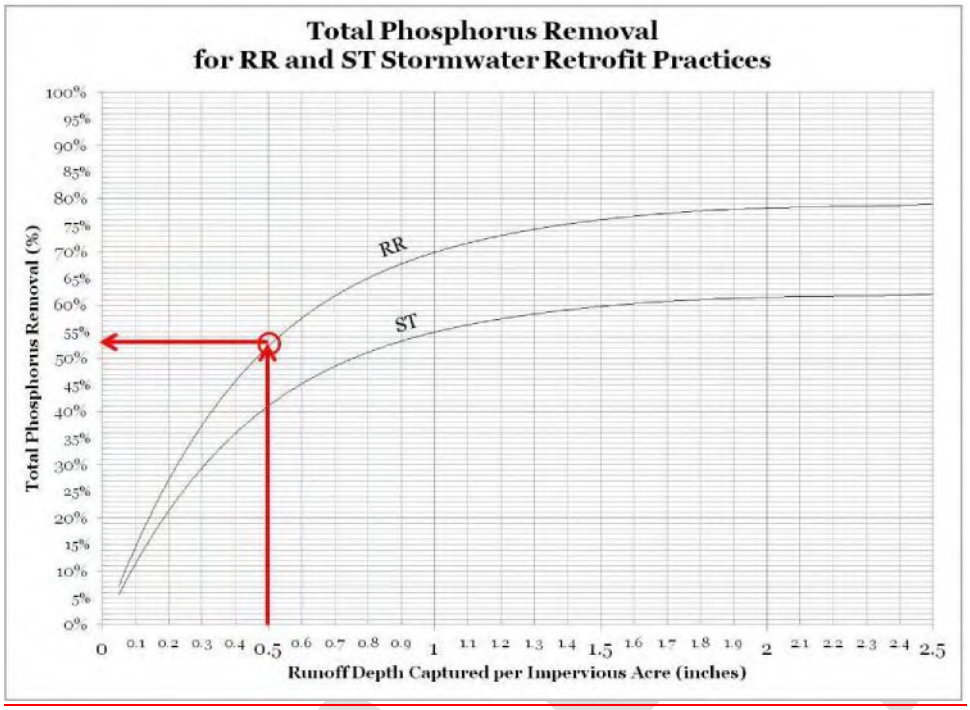


Figure 1 - Retrofit Pollutant Removal Adjustor Curve for Total Phosphorous (TP)

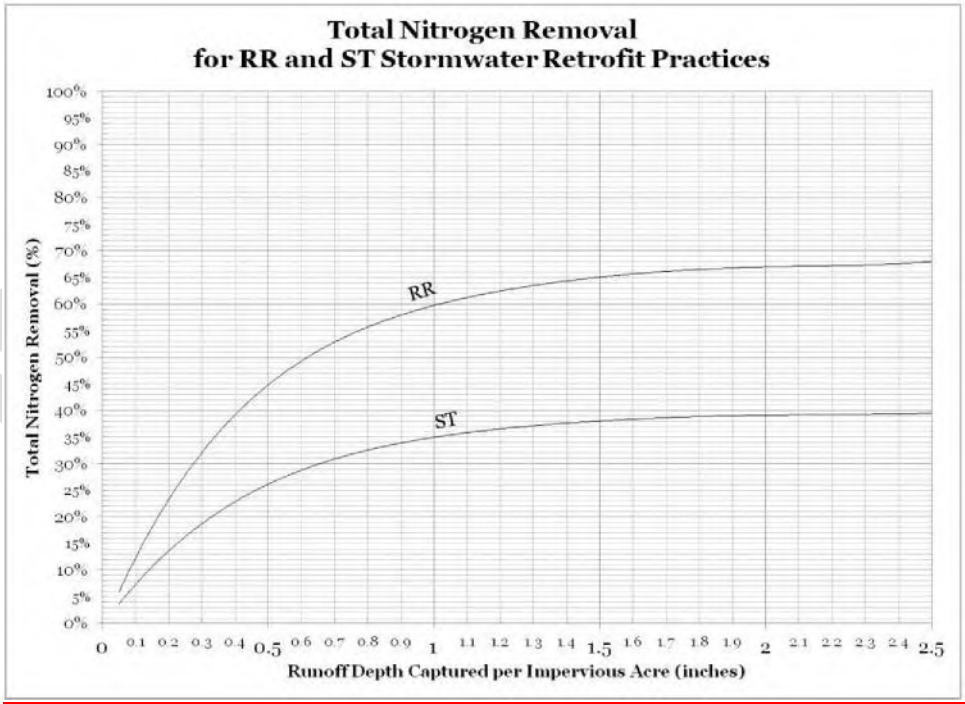


Figure 2 - Retrofit Pollutant Removal Adjustor Curve for Total Nitrogen (TN)

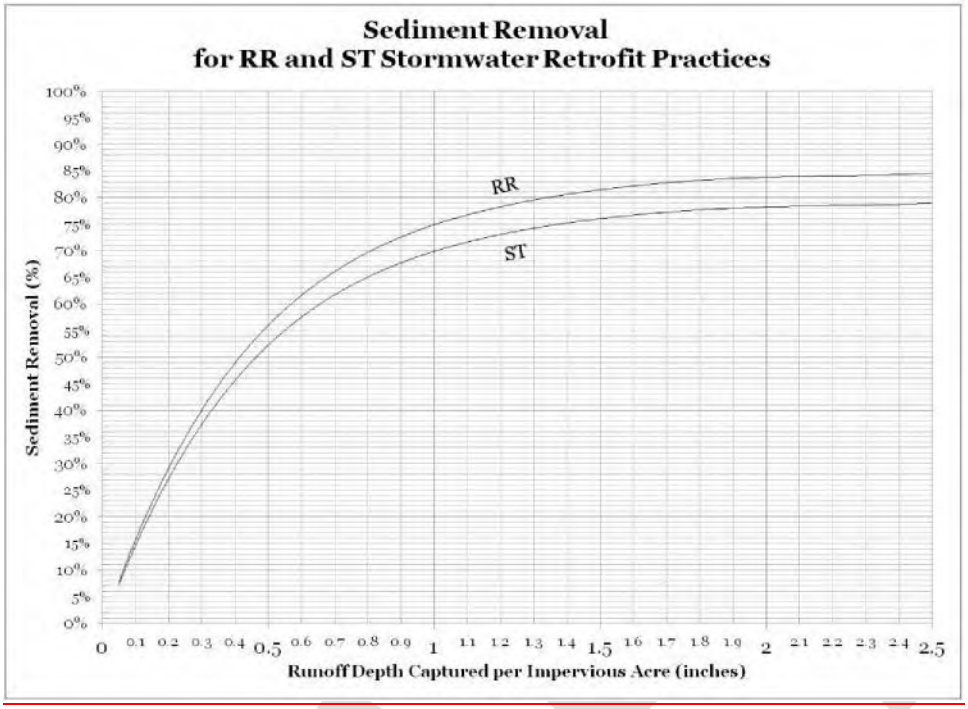


Figure 3 - Retrofit Pollutant Removal Adjustor Curve for Total Sediment (Suspended Solids)

EXAMPLE V.B.1

A small Phase II MS4 with 1000 acres of regulated urban impervious surface and 1000 acres of regulated urban pervious surface is located in the James River Basin. A constructed wetland is planned to treat a 50 acre site that is 40% impervious surface and 60% pervious surface.

Prior to considering this project, the permittee has filled out Tables 2a and 3a in their permit, which are incorporated into this example for reference. The permittee will use the loading rates in Table 2a to determine the loads draining to the proposed BMP.

Calculation Sheet for Estimating Existing Source Loads for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)[1]	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	9.39	*9390*
Regulated Urban Pervious		*1000*	6.99	*6990*
Regulated Urban Impervious	Phosphorus	*1000*	1.76	*1760*
Regulated Urban Pervious		*1000*	0.5	*500*
Regulated Urban Impervious	Total Suspended Solids	*1000*	676.94	*676,940*
Regulated Urban Pervious		*1000*	101.08	*101,080*

[1]This loading rate can be found in 9VAC25-890-40 Section I.C Table 2-a of the General Permit

The second table(s) in the permit must be used to calculate the required reduction for the first permit cycle. This calculation will provide the necessary reductions for the first permit cycle in pounds:

Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)[1]	Total Reduction Required First Permit Cycle (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	0.04	*40*
Regulated Urban Pervious		*1000*	0.02	*20*
Regulated Urban Impervious	Phosphorus	*1000*	0.01	*10*
Regulated Urban Pervious		*1000*	0.002	*2*
Regulated Urban Impervious	Total Suspended Solids	*1000*	6.67	*6670*
Regulated Urban Pervious		*1000*	0.44	*440*

[1]This loading rate can be found in 9VAC25-890-40 Section I.C Table 3-a in the General Permit

Based on the calculations in the table, the permittee must achieve reductions of 60 lbs TN, 12 lbs TP, and 7110 lbs TSS within the first permit cycle. Although this table divides the loads by regulated urban impervious acres and regulated urban pervious acres, the efficiencies calculated using the curves are applied to the entire drainage area, not just its impervious acres. The MS4 intends to offset a portion of this load by installing a constructed wetland to treat a 50 acre site that is 40% impervious (20 acres) and 60% pervious (30 acres).

A constructed wetland is an efficiency BMP. As recommended in the guidance, the permittee intends to use the retrofit curves to calculate the percent removal accomplished by the BMP. To do this, the permittee needs to estimate (1) the BMP's runoff storage in acre-feet and (2) the number of impervious acres draining to the BMP. ~~Using the runoff reduction method spreadsheet, it is calculated that~~The design engineer determines that the runoff storage of the BMP is 1.25 acre-feet. The runoff depth can be estimated using the "Runoff Depth Treated" equation:

$$\frac{(1.25\ acre-feet)(12)}{20\ acres} = 0.75\ in\text{~~ch~~}$$

The runoff depth treated by the constructed wetland is 0.75 inch. From there, the retrofit curves can be used to estimate the removal efficiencies for TP, TN, and TSS. Based on *Table V.B.1* the permittee determines that constructed wetlands are a stormwater treatment (ST) BMP. Using the curves in *Figures 1, 2, and 3,* the permittee estimates that the removal rates are:

TN	TP	TSS
30%	47%	60%

The BMP's efficiency can be translated into pounds by first calculating the site's POC loading without the BMP. Recall that the BMP is being installed to treat land that is 20 acres impervious and 30 acres pervious surface. The acres should be multiplied by the 2009 EOS loading rate for the appropriate basin

(*Appendix I, Table 2a)*. For instance, to estimate the nitrogen reductions provided by the constructed wetland for the impervious surface:

$$20\ acres * 9.39\ lbs\ TN/ac/yr = 187.8\ lbs\ TN/yr$$

and for pervious surface:

$$30\ acres * 6.99\ lbs\ TN/ac/yr = 209.7\ lbs\ TN/yr$$

These values should be multiplied by the efficiency for TN that was calculated above.

$$187.8\ lbs\ TN/yr * 0.30 = 56.34\ lbs\ TN/yr$$

$$209.7\ lbs\ TN/yr * 0.30 = 62.91\ lbs\ TN/yr$$

Therefore, the TN reduction from the constructed wetland is:

$$56.34\ lbs\ TN/yr + 62.91\ lbs\ TN/yr = 119.25\ lbs\ TN/yr$$

With the installation of this BMP, the permittee has reduced its annual load of nitrogen by 119.25 lbs. With this BMP the permittee has met the reduction requirements for the first permit cycle for nitrogen. The reductions that are achieved for the other POC can be calculated using the same procedure.

APPENDIX V.C - Chesapeake Bay Program, Established Efficiencies

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

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

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

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

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

Chesapeake Bay Program Hydrogeomorphic Region affected efficiencies				
BMPs	Region	TN	TP	TSS
Wetland Restoration	Appalachian Plateau Siliciclastic Non-Tidal	7.0%	12%	4.0%
Wetland Restoration	Coastal Plain Dissected Uplands Non-Tidal; Coastal Plain Dissected Uplands Tidal; Coastal Plain Lowlands Tidal; Coastal Plain Uplands Tidal; Coastal Plain Lowlands Non-Tidal; Coastal Plain Uplands Non-Tidal	25%	50%	15%
Wetland Restoration	Blue Ridge Non-Tidal; Mesozoic Lowlands Non-Tidal; Valley and Ridge Carbonate Non-Tidal; Piedmont Crystalline Non-Tidal; Piedmont Carbonate Non-Tidal; Valley and Ridge Siliciclastic Non-Tidal	14%	26%	8.0%

EXAMPLE V.C.1

A small Phase II MS4 with 1000 acres of regulated urban impervious surface and 1000 acres of regulated urban pervious surface is located in the James River Basin. A bioswale is planned to treat a 5 acre site that is 40% impervious surface and 60% pervious surface.

Prior to considering this project, the permittee has filled out Tables 2a and 3a in their permit, which are incorporated into this example for reference. The permittee will use the loading rates in Table 2a to determine the loads draining to the proposed BMP.

Calculation Sheet for Estimating Existing Source Loads for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	2009 EOS Loading Rate (lbs/acre/yr)[1]	Estimated Total POC Load Based on 2009 Progress Run (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	9.39	*9390*
Regulated Urban Pervious		*1000*	6.99	*6990*
Regulated Urban Impervious	Phosphorus	*1000*	1.76	*1760*
Regulated Urban Pervious		*1000*	0.5	*500*
Regulated Urban Impervious	Total Suspended Solids	*1000*	676.94	*676,940*
Regulated Urban Pervious		*1000*	101.08	*101,080*

[1]This loading rate can be found in 9VAC25-890-40 Section I.C Table 2-a of the General Permit

The second table(s) in the permit must be used to calculate the required reduction for the first permit cycle. This calculation will provide the necessary reductions for the first permit cycle in pounds:

Calculation Sheet for Determining Total POC Reductions Required During the Permit Cycle for the James River Basin (*Based on Chesapeake Bay Program Watershed Model Phase 5.3.2)

Subsource	Pollutant	Total Existing Acres Served by MS4 (06/30/09)	First Permit Cycle Required Reduction in Loading Rate (lbs/acre/yr)[1]	Total Reduction Required First Permit Cycle (lbs/yr)
Regulated Urban Impervious	Nitrogen	*1000*	0.04	*40*
Regulated Urban Pervious		*1000*	0.02	*20*
Regulated Urban Impervious	Phosphorus	*1000*	0.01	*10*
Regulated Urban Pervious		*1000*	0.002	*2*
Regulated Urban Impervious	Total Suspended Solids	*1000*	6.67	*6670*
Regulated Urban Pervious		*1000*	0.44	*440*

[1]This loading rate can be found in 9VAC25-890-40 Section I.C Table 3-a in the General Permit

Based on the calculations in the table, the permittee must achieve reductions of 60 lbs TN, 12 lbs TP, and 7110 lbs TSS within the first permit cycle. Although this table divides the loads by regulated urban impervious acres and regulated urban pervious acres, the efficiencies calculated using the curves are applied to the entire drainage area, not just its impervious acres. The MS4 intends to offset a portion of this load by installing a bioswale to treat a 5 acre site that is 40% impervious (2 acres) and 60% pervious (3 acres).

The BMP's efficiency can be translated into pounds by first calculating what the site's POC loading would be without the BMP. Recall that the BMP is being installed to treat land that is 2 acres impervious and 3 acres pervious surface. The acres should be multiplied by the 2009 EOS loading rate for the appropriate basin (*Appendix I, Table 2a)*. For instance, to estimate the nitrogen reductions provided by the constructed wetland for the impervious surface:

$$2\ acres * 9.39\ lbs\ TN/ac/yr = 18.78\ lbs\ TN/yr$$

and for pervious surface:

$$3\ acres * 6.99\ lbs\ TN/ac/yr = 20.97\ lbs\ TN/yr$$

These values should be multiplied by the efficiency for TN that was calculated above.

$$18.78\ lbs\ TN/yr * 0.70 = 13.15\ lbs\ TN/yr$$

$$20.97\ lbs\ TN/yr * 0.70 = 14.68\ lbs\ TN/yr$$

Therefore, the total nitrogen reduction from the bioswale is:

$$13.15\ lbs\ TN/yr + 14.68\ lbs\ TN/yr = 27.83\ lbs\ TN/yr$$

With the installation of this BMP, the permittee has reduced its annual load of nitrogen by 27.83 lbs. The permittee will need to implement additional BMPs to reduce the remaining 32.17 lbs of nitrogen. The reductions that are achieved for the other POC can be calculated using the same procedure.

APPENDIX V.D – BMP Enhancement~~s & Conversions~~, Conversion, & Restoration

The credit permittees will receive for ~~both~~ BMP Enhancements, ~~and~~ Conversions, and Restorations should be calculated using an incremental rate (enhanced BMP efficiency minus existing BMP efficiency). ~~For these calculations either the Bay Program retrofit curves or established efficiencies should be used.~~ The permittee should apply the difference between the existing BMPs efficiency and the enhanced or converted BMP's efficiency to the load that is draining to the BMP to calculate the POC reduction that will be credited.

Please see the *Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects* to determine if a project qualifies as a major restoration. The report may be found at: *http://www.chesapeakebay.net/documents/Final_CBP_Approved_Expert_Panel_Report_on_Stormwater_Retrofits--_long.pdf*

~~Although the *Recommendations of the Expert Panel to Define Removal Rates for Urban Stormwater Retrofit Projects* also lists some scenarios where permittees may receive credit for BMP restoration, any reduced capacity that is the result of routine maintenance not being performed will not qualify for credit.~~

EXAMPLE V.D.1

The same small MS4 is planning to convert a Dry Extended Detention Pond to a Wet Pond. A 10 acre site that is 50% impervious (5 acres) and 50% pervious (5 acres) drains to the existing Pond and the planned upgrades will not alter the BMP's drainage area. Using the same method that was used in *Example V.A.1* and *Example V.B.1* the permittee calculates that the loads draining to the pond are:

for impervious surface:

$$5\ acres * 9.39\ lbs\ TN/ac/yr = 46.95\ lbs\ TN/yr$$

and for pervious surface:

$$5\ acres * 6.99\ lbs\ TN/ac/yr = 34.95\ lbs\ TN/yr$$

To calculate the credits for this conversion, the permittee first needs to estimate the removal efficiency of the existing Dry Extended Detention pond. The initial pond was not built to meet VA Stormwater BMP Clearinghouse standards, so the permittee chooses to use the accepted Bay Program Efficiencies as its starting point. For Dry Extended Detention Ponds the accepted Bay Program removal efficiencies are:

TN	TP	TSS
20%	20%	60%

Next the permittee must estimate the efficiency of the wet pond that will result from the conversion. For this the permittee elects to use the Bay Program Curves since, as the result of design constraints, the newly converted pond cannot meet all of the Clearinghouse standards for that BMP type. Using the same process described in *Appendix V.B* the permittee estimates the new wet pond will have a runoff depth treated of one inch. Since Wet Ponds are a ST practice, the permittee uses the provided curves to estimate that the pollutant removal rates are:

TN	TP	TSS
33%	52%	66%

To determine the credits, the permittee must subtract the efficiencies from the existing dry pond from the efficiencies for the new wet pond.

For TN

$$33\% - 20\% = 13\%$$

So for the nitrogen loads draining to the new wet pond the permittee will receive credit for reductions of 13 percent.

$$46.95\ lbs\ TN/yr\ *\ 0.13\ =\ 6.104\ lbs\ TN/yr$$

$$34.95\ lbs\ TN/yr\ *\ 0.13\ =\ 4.544\ lbs\ TN/yr$$

The conversion results in a total increased reduction of 10.65 lbs TN/yr. The interim efficiencies and pollutant reductions can be calculated using the same method for the other POC.

Existing BMP Efficiency Modification

If the BMP being enhanced, ~~or~~ converted, or restored is missing major design elements or is substantially undersized the permittee may modify the "existing BMP efficiency" that is used to calculate the incremental rate. **NOTE**: Permittees may only use this modification method if the Bay Program Established Efficiencies are used to determine the initial BMP's efficiency prior to an enhancement, conversion, or restoration project. The VA BMP Clearinghouse efficiencies may only be used if all design elements are present. Likewise, the Clearinghouse curves should not require additional modification to account for missing design elements. Instead any deficiencies should be captured in a reduced initial runoff storage value for the practice. ~~This may be especially important for Dry Detention Ponds and Dry Extended Detention Ponds.~~ Permittees will need to exercise their best professional judgment if applying an efficiency modification to an existing BMP. To receive credit for this type of modification, permittees should submit the appropriate supporting documentation to the Department for approval. All documentation supporting that modification should also be made available to the Department for verification upon request.

A Visual Inspection Checklist can be used for any design deficiencies that inhibit the full performance of a BMP when calculating credit for an enhancement, ~~or~~ conversion, or restoration. ~~**However, reduced capacity that is the result of routine maintenance not being performed does not qualify for a modification. As such, any effort that only restores a BMP to its original design capacity will not be credited.** This may include activities such as suspended solids removal or vegetative harvesting.~~

Permittees should document how their modification decisions were made so that the Department may verify that the modification applied was appropriate. Supporting documentation, such as a visual inspection checklist and modification tables should be submitted to the department in support of modifications. In all cases, best professional judgment should be used.

Permittees may apply a downward modification of up to 10% for each design criteria that is missing or each aspect of the practice that is undersized. The total modification should not exceed 50 percent~~%, with the exception of any BMPs installed before 1991 which may have a modification of 100% applied to them. In all cases the initial BMP cannot have an efficiency that is less than zero.~~.

EXAMPLE V.D.2

In reviewing the previous BMP conversion, the permittee determines through a field review that the initial dry pond is eligible for an efficiency modification. BMPs should be modified based on any specific deficiencies present. ~~For all BMPs, permittees should consider the era in which they were built:~~

> ~~***Construction Era***~~
> ~~*The design criteria for existing BMPs varied based on the time of planning and implementation. BMPs implemented before 1991 likely were designed for only water quantity and do not provide water quality benefit. BMPs implemented between 1991 and 1999 may have been designed for water quality and as such may be discounted.*~~
>
> ~~*Permittees should select one of the following for each BMP:*~~
> 1. ~~*Pre 1991 – BMPs installed prior to 1991 with no subsequent upgrades should be treated as a conversion with no prior water quality value.*~~
> 2. ~~*1991 – 1999 – BMPs installed between 1991 and 1999 with no subsequent upgrades may have an initial downward modification of 10% applied to their efficiencies. The initial removal efficiencies for these BMPs may also be modified downward based on any specific deficiencies present.*~~
> 3. ~~*Post 1999 – BMPs installed after 1999 should be modified based on any specific deficiencies that present.*~~

For instance, e~~E~~lements specific to dry ponds or dry extended detention ponds that permittees might consider for a modification include:

> ***Missing Design Criteria***
> *For each missing design criterion, the permittee should apply an additional downward modification of 10% to the BMP's initial removal efficiency. Missing Design Criteria for a Dry Pond may include:*
>
> - *Absence of a sediment forebay*
> - *Absence of a micro pool or other form of protection at the riser outlet*
> - *Short circuiting due to the initial inlet placement (note: short circuiting can qualify for an efficiency modification only if it is the result of the initial BMP design. If short circuiting is the result of sediment accumulation it should not be considered for an efficiency modification)*

and

> ***Undersized Practice***
> *Permittees may modify the efficiency of the BMP downward by 10% if some aspect of the BMPs original design is undersized. For a dry pond this may include:*
>
> - *Small Drainage Area – if the drainage area is 5 acres or less AND the drainage orifice is greater than 3 inches (pre 1999 BMPs only) OR if the Dry Pond has less than a minimum 12 hour draw down time*
> - *If the minimum volume of the pond is less than 2 * WQv (where WQv is .5 inches * the area of the impervious cover draining to the pond).*

For the dry pond in question, the permittee determines it was constructed in 1994, is missing a sediment forebay and has no riser outlet protection. The permittee summarizes this information in a spreadsheet for submission to the Department:

Sample Modification Table/Spreadsheet

BMP Type	BMP Location	Modification Type	Downward Modification Applied (%)
Dry Pond	(*Lat, Long*)	Missing Sediment Forebay	10
		No Riser Outlet Protection	10
		Total	2~~3~~0

Based on the review of the BMP, the permittee would be able to apply a ~~30~~20% downward modification to the initial efficiency of the Dry Extended Detention Pond being enhanced or converted. So instead of the initial practice having efficiencies of 20%, 20%, and 60% for TN, TP, and TSS (*Table V.C.1)* the permittee would calculate the efficiencies ~~30~~20% downward for initial efficiencies of ~~14~~16%, ~~14~~16% and ~~42~~ 48 percent. These downward modified efficiencies are then used to calculate the incremental efficiencies applied to their POC loads.

So instead of the calculation shown in *Example V.D.1* to calculate the POC reductions for BMP enhancement from an existing dry extended detention pond to a Wet Pond, the permittee would perform the following calculation to estimate the increased POC reductions from the conversion:

$$52\% - 1~~4~~6\% = 3~~8~~6\%$$

This efficiency is then applied to the calculated load

$$46.95\ lbs\ TN/yr\ *\ 0.3~~8~~6\ =\ 16.90~~17.84~~\ lbs\ TN/yr$$

$$34.95\ lbs\ TN/yr\ *\ 0.3~~8~~6\ =\ 12.58~~13.28~~\ lbs\ TN/yr$$

$$12.58~~13.28~~\ lbs\ TN/yr + 16.90~~17.84~~\ lbs\ TN/yr = 29.48~~31.12~~\ lbs\ TN/yr$$

The conversion, with an appropriate modification applied to the existing BMP, results in a total load reduction of 29.48~~31.12~~ lbs TN/yr

APPENDIX V.E – Treatment Trains

Although BMPs should be reported to the Department individually, the permittee may receive credit for BMPs that are implemented as part of a treatment train. For treatment trains composed of BMPs from the Virginia Stormwater BMP Clearinghouse the Runoff Reduction Method Spreadsheet can be used to account for the impact of the treatment train. If the retrofit curves are used, the permittee will need to use their best professional judgment to identify the predominant BMP that will be credited. If BMPs with Bay Program approved efficiencies are used, the permittee may calculate the reduced loading rate that will flow to each BMP in the treatment train to estimate the appropriate reductions for each step.

APPENDIX V.F – Street Sweeping

In the initial publication of this guidance document a street sweeping efficiency was provided in Table V.C.1. Upon further review, it was determined that a single efficiency is not an appropriate method for calculating reductions from this practice. Instead permittees should follow one of the suggested Bay Program methods: the "mass loading approach" or "qualifying street lanes method." The crediting for this procedure is outlined in a March 2011 Memo from the Bay Program (http://www.chesapeakebay.net/channel_files/13238/bmp_memo_to_wg_for_street_and_era.pdf) and further fleshed out in Section 5.3.8 of the Chesapeake Stormwater Network's *Technical Bulletin 9* (http://chesapeakestormwater.net/wp-content/uploads/downloads/2012/03/TB-9-Nutrient-Accounting-FINAL-DRAFT.pdf). Permittees should follow the procedure described in the Technical Bulletin to calculate reductions from street sweeping.

Permittees should pay particular attention to the qualifying conditions for credit. The nutrient reductions only apply to an enhanced street sweeping program conducted by a community that has the following characteristics:

- An urban street with a high average daily traffic volume located in commercial, industrial, central business district, or high intensity residential setting.
- Streets are swept at a minimum frequency of 26 times per year (every two weeks), although a municipality may want to bunch sweepings in the spring and fall to increase water quality impact.
- The reduction is based on the sweeping technology in use, with lower reductions for mechanical sweeping and higher reductions for vacuum assisted or regenerative air sweeping technologies.
- Localities need to document the length of lane miles swept using their traditional routes

Permittees should note that these methods and efficiencies are not finalized. However, regardless of the method that is used to calculate credits for street sweeping, permittees should note that **street sweeping will be credited annually**. Permittees will need to report the pounds of pollutants reduced using one of the two recommended methods with each Annual Report. If permittees commit to a level of pollutant removal to achieve their 5% reductions and fall short of meeting those pollutant reductions in subsequent years, additional reductions will need to be made to make up the difference. Permittees may wish to be conservative in their estimates of the amount of pollutants that will be reduced by street sweeping annually to avoid shortfalls in the future.

APPENDIX V.GF – Land Use Change

Permittees may receive credit for land use change conversions based on the number of acres converted. Conversion efficiencies for land use change are dependent on basin and are listed in Table V.FG.1. Permittees may receive credit for converting:

1. Impervious to Forest – Permittees may receive credit for converting any Impervious Surface to Forest. To receive credit for the "Forest" land use, permittees should meet the tree density per acre described in the Virginia Department of Forestry's Land Use Tax Assessment Standards (*Table V.FG.2*), which can also be found on the Virginia Department of Forestry's website: http://www.dof.virginia.gov/land/usetax/assessment-standards.htm.
2. Impervious to Grass – Permittees may receive credit for converting any Impervious Surface to Grass. To qualify for this credit the "Grass" must be unmanaged (i.e. no nutrient application).
3. Impervious to Pervious – Permittees may receive credit for converting any Impervious Surface to a Pervious Surface other than Forest and/or Grass. Pervious surfaces might include: lawns, unimpacted gravel, railroad embankments/side slopes, etc. If a permittee is unsure if a surface is considered "pervious," the Department should be contacted for further guidance.
4. Pervious to Forest – Permittees may receive credit for converting any Pervious Surface, including unmanaged Grass, to Forest.
5. Pervious to Grass – Permittees may receive credit for converting any Pervious Surface, other than Forest, to unmanaged Grass.

Table V.FG.1 – Land Use Change Conversion Efficiency Table

Basin	Land Use from	Conversion	Edge of Stream Reductions TN(lbs/ac/year)	Edge of Stream Reductions TP(lbs/ac/year)	Edge of Stream Reductions TSS(lbs/ac/year)
James	Impervious	Forest	7.31	2.07	875.11
James	Impervious	Grass	6.87	1.55	486.31
James	Impervious	Pervious	2.29	1.60	817.29
James	Pervious	Forest	5.03	0.48	57.82
James	Pervious	Grass	4.58	0.00	0.00
Potomac	Impervious	Forest	13.91	1.80	1252.01
Potomac	Impervious	Grass	12.56	1.34	623.28
Potomac	Impervious	Pervious	6.75	1.42	1119.05
Potomac	Pervious	Forest	7.16	0.38	132.96
Potomac	Pervious	Grass	5.81	0.00	0.00
Rappahannock	Impervious	Forest	11.51	2.26	866.31
Rappahannock	Impervious	Grass	10.04	1.67	206.99
Rappahannock	Impervious	Pervious	4.19	1.74	793.13
Rappahannock	Pervious	Forest	7.32	0.53	73.18
Rappahannock	Pervious	Grass	5.85	0.00	0.00
York	Impervious	Forest	6.83	1.49	749.05
York	Impervious	Grass	6.06	1.17	430.00
York	Impervious	Pervious	1.65	1.10	670.75
York	Pervious	Forest	5.18	0.40	78.30
York	Pervious	Grass	4.41	0.08	0.00

Table V.~~F~~G.2 - Minimum Number of Trees Required Per Acre to Determine 30 Square Feet of Tree Basal Area of 40% Stocking For Classification as Forest Land

D.B.H. Range	D.B.H. in 2" Classes	Basal Area Per Tree	Per Acre	Per 1/5 Acre	Per 1/10 Acre
up to 2.9"	Seedlings		400	80	40
3.0-4.9"	4	0.0873	400	80	40
5.0-6.9"	6	0.1964	153	31	15
7.0-8.9"	8	0.3491	86	17	9
9.0-10.9"	10	0.5454	55	11	6
11.0-12.9"	12	0.7854	38	8	4
13.0-14.9"	14	1.0690	28	6	3
15.0" +	16+	1.3963	21	4	2

EXAMPLE V.~~F~~G.1

A locality in the Potomac River Basin is converting 1.5 acres of contiguous land from impervious surface to forest. The trees being planted all fall between 5 and 6.9 inches in diameter at breast height (4.5 feet from ground level), so the permittee must plant at least 153 trees per acre or at least 230 trees on the site to qualify for the land use conversion. To calculate the credit the permittee will receive, the appropriate values from *Table V.~~F~~G.1* should be used.

For TN:

$$1.5\ acres\ converted * 13.91 lbs\ TN/ac/yr = 20.87\ lbs\ TN/yr$$

For TP:

$$1.5\ acres\ converted * 1.80\ lbs\ TP/ac/yr = 2.7\ lbs\ TP/yr$$

For TSS:

$$1.5\ acres\ converted * 1252.01\ lbs\ TSS/ac/yr = 1{,}878.02\ lbs\ TSS/yr$$

Through the land use conversion the permittee has offset 20.87 lbs TN/yr, 2.7 lbs TP/yr, and 1,878.02 lbs TSS/yr.

APPENDIX V.~~G~~H – Forest Buffers

Forest Buffers can be credited as both a land use change and efficiency BMP. The land use change component should be credited in accordance with the applicable section of *Table V.G~~F~~.1* in *Appendix V.G~~F~~*. The efficiency is applied at up to a 2-to-1 ratio for upland acres that drain to the buffer as sheetflow (i.e. if a one acre buffer is installed, but only 1.5 upland acres drains to the buffer as sheetflow, the permittee may only receive the efficiency credit for 1.5 acres). The following established efficiencies for TP, TN, and TSS should be used (*Table V.G~~H~~.1*):

Table V.G~~H~~.1 - Efficiencies for Forest Buffers Applied to Two Upland Acres per Acre of Buffer

Practice	TN	TP	TSS
Forest Buffer	25%	50%	50%

EXAMPLE V.G~~H~~.1

A permittee in the Potomac River basin has identified an area of regulated land adjacent to a stream as a candidate site for a forest buffer. The site has 311.14 linear feet of stream that can be buffered with an average width of 35 feet for a total of a 0.25 acre forest buffer. The land the forest buffer will be implemented on and the land draining to the buffer is all urban pervious.

Calculating the nutrient reductions provided by this BMP is a two part process. The first step is to calculate the reductions that result from the land use conversion. The permittee is converting pervious surface to forest, so using *Table V.~~F~~G.1* in *Appendix V.G~~F~~*, the permittee can identify the appropriate conversion factor, which is 7.16 lbs/acre for nitrogen. The permittee should multiply this value by the acres changed to calculate the land use change reduction for the site:

$$7.16\ lbs\ TN/ac/yr * 0.25\ acres = 1.79\ lbs\ TN/yr$$

In addition to the land use change credit, the permittee will also receive an efficiency credit for this BMP. Again, the permittee should calculate the loading rate for the land draining to the BMP. Upland acres are treated by forest buffers at a ratio of 2:1, so there are:

$$0.25\ acres\ converted * 2 = 0.5\ upland\ acres\ treated$$

The permittee verifies that there are at least 0.5 upland acres draining to the buffer as sheetflow, so the permittee may take the full efficiency credit for this forest buffer.

The permittee should multiply the number of upland acres treated by the appropriate loading rate from Section I.C.2.a.(4) in the MS4 permit, in this case *Table 2b* for the Potomac watershed.. As noted above, all the land draining to the BMP is urban pervious so for nitrogen, the loading rate for all acres draining to the buffer is 10.07 lbs. To estimate the loading rate after the BMP is applied, the permittee should multiply the initial loading rate by the BMPs efficiency, which is 25% (*Table V.G~~H~~.1*):

$$10.07\ lbs\ TN/ac/yr * 0.25 = 2.52\ lbs\ TN/ac/yr$$

The permittee should multiply the upland acres treated by this modified loading rate to calculate the pounds of nitrogen reduced:

$$2.52\ lbs\ TN/ac/yr * 0.5\ acres = 1.26\ lbs\ TN/yr$$

This result should be added to the result from the land use conversion for a total reduction of:

$$1.79\ lbs\ TN/yr + 1.26\ lbs\ TN/yr = 3.05\ \ lbs\ TN/yr$$

With the installation of the forest buffer, this permittee has reduced its annual load of TN by 3.05 lbs/yr. The same procedure can be followed to calculate the reductions for TP and TSS.

APPENDIX V.~~H~~I – Urban Stream Restoration

For urban stream restoration projects that have been initiated~~implemented since~~ on or after January 1,~~une 30,~~ 200~~6~~9 and those that cannot conform to any of the four protocols for stream restoration, permittees should use the interim approved removal rates developed by the Bay Program to calculate credits. These efficiencies can be found in *Table V.~~H~~I.1*.

Table V.~~H~~I.1 – Urban Stream Restoration Interim Approved Removal Rates

BMPs	How Credited	TN	TP	TSS
Stream Restoration	Mass reduction/length (lbs/linear ft)	0.075	0.068	4~~43~~.88~~4~~/15.13 *

*The value that should be used to calculate reductions for sediment is dependent on the project's location. Projects located outside the coastal plain should use 44.88 lbs TSS/linear ft. Projects located within the coastal zone should use 15.13 lbsTSS/linear ft.

In addition to the removal rates, there are four established protocols for urban stream restoration that a permittee may use to calculate reductions from urban stream restoration projects. However, the Department strongly recommends that permittees use the interim approved removal rates to calculate reductions for stream restoration projects during Action Plan development because the Stream Restoration Protocols are still actively under review and revision.

The four protocols are:

1. Prevented Sediment During Storm Flow
2. Instream and Riparian Nutrient Processing During Base Flow
3. Floodplain Reconnection Volume
4. Dry Channel Regenerative Stormwater Conveyance (RSC) as an Upland Stormwater Retrofit

These protocols, and the interim removal rates, may only be applied to 0-3rd order streams and credit cannot be received for improvements to stream sections that are tidally influenced. The first three protocols require direct measurements to estimate pollutant reductions. Pollutant reductions for the fourth option can be calculated using the curves provided by the Bay Program for the other runoff reduction BMPs. Full requirements for each type of stream restoration and how they are credited in the Bay Program are described in greater detail in the following report:

> *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects*, ~~January~~ September 2014, which can be found at: http://www.chesapeakebay.net/documents/Stream_Panel_Report_Final_08282014_Appendices_A_G.pdf~~http://chesapeakestormwater.net/wp-content/uploads/downloads/2014/02/Stream_Panel_Report_Final_02062014_LONG_Version.pdf~~

Once the reductions from an Urban Stream Restoration project are calculated using one of the accepted methodologies, the credit a permittee may receive must be adjusted to account for the baseline required for the proportion of ~~reductions on any~~ unregulated land ~~the~~ that drains to the restored stream section. Permittees do not need to account for any BMPs installed upstream of a stream restoration project when calculating the reduction from the project~~.~~. **NOTE**: In the initial version of this guidance document permittees also had to account for the amount of forested lands draining to a stream restoration project, and subtract from the total reductions the proportion of the upstream area that receives drainage from forested land. This has been revised. Regardless of whether these lands are incorporated into the initial

reductions calculated using the tables, permittees do not have to reduce the credit received from a stream restoration project based on the proportion of forested acres draining to the project.

NOTE: Stream Restoration projects included in the Action Plan must include clear documentation of the degraded nature of the stream prior to restoration. Permittees should incorporate verification activities into their stream restoration projects, such as periodic visual inspections, to ensure the project does not degrade.

EXAMPLE V.~~H~~I.1

To meet its TMDL reduction requirements~~s~~, a Phase II permittee in the James River basin has decided to implement a stream restoration project. In accordance with the GP, the permittee may receive credit for the implementation of BMPs on unregulated lands provided any necessary baseline reduction is accounted for (Section I.C.2.b.(1)). For stream restoration projects that receive drainage from both regulated and unregulated lands, permittees may take full credit for the loads draining from regulated lands and an adjusted credit for loads draining off unregulated lands that accounts for baseline reductions (Section I.C.2.b.(2)). Permittees may receive full credit for the proportion of unregulated forested acres or agricultural lands draining to the project because there is no baseline requirement for those lands.

Step 1: Calculate the POC Reductions from the Proposed Stream Restoration Project:

The permittee uses the default rate (*Table V.~~H~~I.1*) to calculate the stream restoration project's POC reductions. The permittee is restoring a 1,000 linear foot stream reach. The calculated reductions for this project are:

TN	TP	TSS
75 lbs/yr	68 lbs/yr	44,880 lbs/yr

Step 2: Characterize the Acres Draining to the Proposed Stream Restoration Project:

To quantify the stream restoration project reductions that can be credited toward meeting the TMDL, the permittee must first characterize the acres that drain to the project. The permittee estimates the regulated urban impervious and urban pervious acres, unregulated urban impervious and urban pervious acres, and forested acres draining to the stream length that will be restored:

	Urban Impervious Acres	Urban Pervious Acres	Total Urban Acres	Forested Acres	
Regulated Land[1]	9.08	6.37	15.45	1.90	
Unregulated Land	.21	1.64	1.85	7.36	Total
		Total	17.3	9.26	26.56

[1]Regulated Land means acres that drain to any MS4 system.

Using this information, ratios of regulated, unregulated, and forested acres to total acres can be calculated:

15.45 acres regulated land/26.56 total acres = 0.58 regulated acreage ratio~~s~~

1.85 unregulated acres/26.56 total acres = 0.07 unregulated acreage ratios

9.26 forested acres/26.56 total acres = 0.35 forested acres

Step 3: Calculate the Total Reductions for Regulated and Unregulated Urban Lands

Permittees may receive credit for stream restoration projects from:

1. **Regulated Urban Acres**: permittees may Rreceive the full reduction credit for the proportion of the project that receives drainage from regulated acres
2. ~~Receive an adjusted reduction credit for the proportion of the project that receives drainage from unregulated acres~~
2. ~~NOT receive credit for the proportion of the project that receives drainage from acres that are forested.~~**Unregulated Urban Acres**: permittees may receive an adjusted reduction credit for the proportion of the project that receives drainage from unregulated acres
3. **Unregulated Forested or Agricultural Acres**: permittee's may receive full credit for the proportion of the project that receives drainage from unregulated forested or agricultural lands, as there is no baseline requirement for these lands.

So, to calculate the TSS credits it may receive for this stream restoration project, the permittee should multiply the total project TSS reduction calculated in *Step 1* (45,974 lbs TSS/yr) by the ratios calculated in *Step 2*:

For regulated acres: 44,880 lbs TSS * 0.58 = 26,030.4 lbs TSS

For unregulated urban acres: 44,880 lbs TSS * 0.07 = 3,141.6 lbs TSS

For unregulated forested acres: 44,880 lbs TSS * 0.35 = 15,708 lbs TSS

Step 4: Account for the Total Baseline Reductions on Unregulated Land

For load reduction calculated for unregulated acres must be adjusted to account for the baseline reduction required on unregulated land. This calculation is based on the loading rates found in Tables 3a-d of the permit. The impervious and pervious load reductions that must be achieved in the first permit cycle (5.0% of the total required reductions) are multiplied by 20 to estimate the entire baseline reductions needed to comply with the Chesapeake Bay TMDL by the end of the third MS4 permit cycle. For TSS the permittee calculates that the baseline loading rate for its project in the James River Basin (Table 3a) for

urban impervious acres is:

6.67 lbs TSS/ac/yr * 20 = 133.40 lbs TSS/ac/yr

and for urban pervious acres is:

0.44 lbs TSS/ac/yr * 20 = 8.80 lbs TSS/ac/yr

The total required baseline reduction can be calculated by multiplying these loading rates by the unregulated urban acres draining to the stream restoration project. ~~For:~~

For urban impervious acres this is:

133.40 lbs TSS/ac/yr * 0.21 Unregulated Urban Impervious Acres = 28.01 lbs TSS/yr

and for urban pervious acres this is:

8.80 lbs TSS/ac/yr * 1.64 Unregulated Urban Pervious Acres = 14.43 lbs TSS/yr

for a total baseline reduction of:

28.01 lbs TSS/yr + 14.43 lbs TSS/yr = 42.44 lbs TSS/yr

The permittee *may not* take credit for 42.44 lbs TSS reduction from the unregulated lands draining to the stream restoration project. The permittee should subtract this value from the total TSS credit that was calculated in Step 1:~~the TSS credit for unregulated acres that was calculated in *Step 3*:~~

~~3,141.6 lbs TSS/yr – 42.44 lbs TSS/yr = 3,099.16 lbs TSS/yr~~

~~The permittee may take credit for 3,099.16 lbs TSS/yr for the proportion of unregulated land draining to the stream restoration project.~~

~~**Step 6: Calculate Total Reductions from Regulated and Unregulated (Non-Forested) Acres, Accounting for Required Baseline Reductions:**~~

~~To calculate the credit towards meeting the reductions required under the TMDL the permittee should receive for this stream restoration project, the adjusted credit for unregulated acres calculated in *Step 5* should be added to the credit the permittee receives for the proportion of regulated acres draining to the restored stream calculated in *Step 3*:~~

44,880 lbs TSS/yr – 42.44 lbs TSS/yr = 44,837.56~~26,030.4 lbs TSS/yr + 3,099.16 lbs TSS/yr = 29,129.56 lbs TSS/yr~~

The permittee should receive credit for reducing 44~~29~~,837~~129~~.56 lbs TSS/yr through this stream restoration project. The calculations for TN and TP can be done using the same process.

APPENDIX V.~~I~~J – Urban Nutrient Management

Permittees are required under the "Turf and Landscape Management" of the permit (GP Section II.B.6.c) to develop NMPs on "all lands owned or operated by the MS4 operator where nutrients are applied to a contiguous area greater than one acre." Permittees cannot receive credit towards the TMDL reduction requirements for the development of NMPs that are required by Virginia statute or regulation. However, permittees may receive credit for NMPs that are developed for lands outside the MS4 service area[17], public lands within the MS4 service area that are one contiguous acre or less, or privately owned lands where nutrients are applied that are not golf courses. Urban Nutrient Management plans can be applied and reported in partial acres. If any BMPs are installed downstream of land where a credited urban nutrient management plan has been applied, permittees will need to account for the reduced pollutant load going to that BMP. The efficiency accepted for nutrient management is based on the risk level for the site. Where the risk level is unknown, permittees should use the blended efficiency (*Table V.~~I~~J.1*).

TABLE V.~~I~~J.1 – Urban Nutrient Management Removal Rate

Site Risk Level	TN	TP
High	20%	10%
Low	6%	3%
Unknown (Blended)	9%	4.5%

The removal rate represents a percent reduction of pervious load based on the number of acres the UNM plan covers. The load that is reduced should be calculated based on the loading rates in permit Tables 2a-d. How risk for the site is estimated is discussed in greater detail in the following report:

- *Recommendation of the Expert Panel to Define Removal Rates for Urban Nutrient Management,* March 2013, which can be found at: http://www.chesapeakebay.net/documents/Final_CBP_Approved_Expert_Panel_Report_on_Urban_Nutrient_Management--short.pdf

EXAMPLE V.~~I~~J.1 – Nutrient Management on Unregulated Land

A permittee in the York River Basin develops an NMP for 5 acres of privately owned turf fields that are located outside of their regulated MS4 service area. Since the NMP is for unregulated land, the permittee will receive an adjusted credit for the NMP after the baseline reductions are subtracted from the total expected NMP reductions.

To calculate the reductions from the NMP that will be credited towards the TMDL reduction requirements the permittee should first calculate the POC reductions from the NMP based on the *Recommendation of the Expert Panel to Define Removal Rates for Urban Nutrient Management*. The permittee references Table 2d in the permit to calculate the POC loads for the 5 acre project:

5 acres * 7.65 lbs TN/ac/yr = 38.25 lbs TN/yr

5 acres * 0.51 lbs TP/ac/yr = 2.55 = lbs TP/yr

The risk level for the 5 acres is unknown, so the permittee uses the blended efficiency to calculate the reductions from the NMP:

38.25 lbs TN/yr * 0.09 = 3.44 lbs TN/yr

[17] If the BMP was funded by a 319 nonpoint source grant, it may be contrary to the funding award to seek credit towards required reductions under the Special Condition

2.55 lbs TP/yr * 0.045 = 0.11 lbs TP/yr

In accordance with Section I.C.2.b.(1) the permittee must account for baseline reductions on unregulated land before taking credit for any BMPs. For NMPs, baseline is the 48% reduction on all urban pervious lands that is assumed under the WIP. The permittee may receive credit for the remaining 52% of the project's reductions:

3.44 lbs TN/yr * .52 = 1.79 lbs TN/yr

.11 lbs TP/yr * .52 = 0.06 lbs TP/yr

For developing a NMP for 5 acres of privately owned turf fields outside of the permittee's MS4 service area, the permittee may take credit for reductions of 1.79 lbs TN/yr and 0.06 lbs TP/yr.

APPENDIX V.~~J~~ K – Development on Prior Developed Lands (Redevelopment)

Permittees may receive credit for redevelopment projects if the pre-development pollutant load is reduced, regardless of the initial land use condition. Under VSMP regulations (9VAC25-870), development projects may be subject to either Technical Criteria II B or Technical Criteria II C:

Projects Subject to Technical Criteria II B:

Under VSMP regulations those projects subject to Technical Criteria II B permittees are (1) required to reduce phosphorous by 20% for land-disturbing activities disturbing greater than or equal to one acre that result in no net increase in impervious cover from the predevelopment condition or (2) reduce phosphorous by 10% for land-disturbing activities disturbing less than one acre that result in no net increase in impervious cover from the predevelopment condition. Permittees may take credit for these reductions. Permittees may also take credit for any Nitrogen and/or Sediment reductions that are created by the BMPs that are implemented to meet these requirements.

Projects Subject to Technical Criteria II C:

Technical Criteria II C applies to those projects that initiate construction prior to July 1, 2014 or are grandfathered in accordance with 9VAC-25-870-48. For these projects, permittees may use either the (1) performance-based criteria or the (2) technology- based criteria:

(1) Performance Based Criteria – Reductions may be credited to the permittee if the phosphorous load is reduced through development of prior developed lands (See Appendix II – Situation 3).
(2) Technology Based Criteria – If this approach is used, no additional reductions are required under the Special Condition beyond those for existing development under Special Condition requirement 6 (GP Section I.C.2.a.(6)).

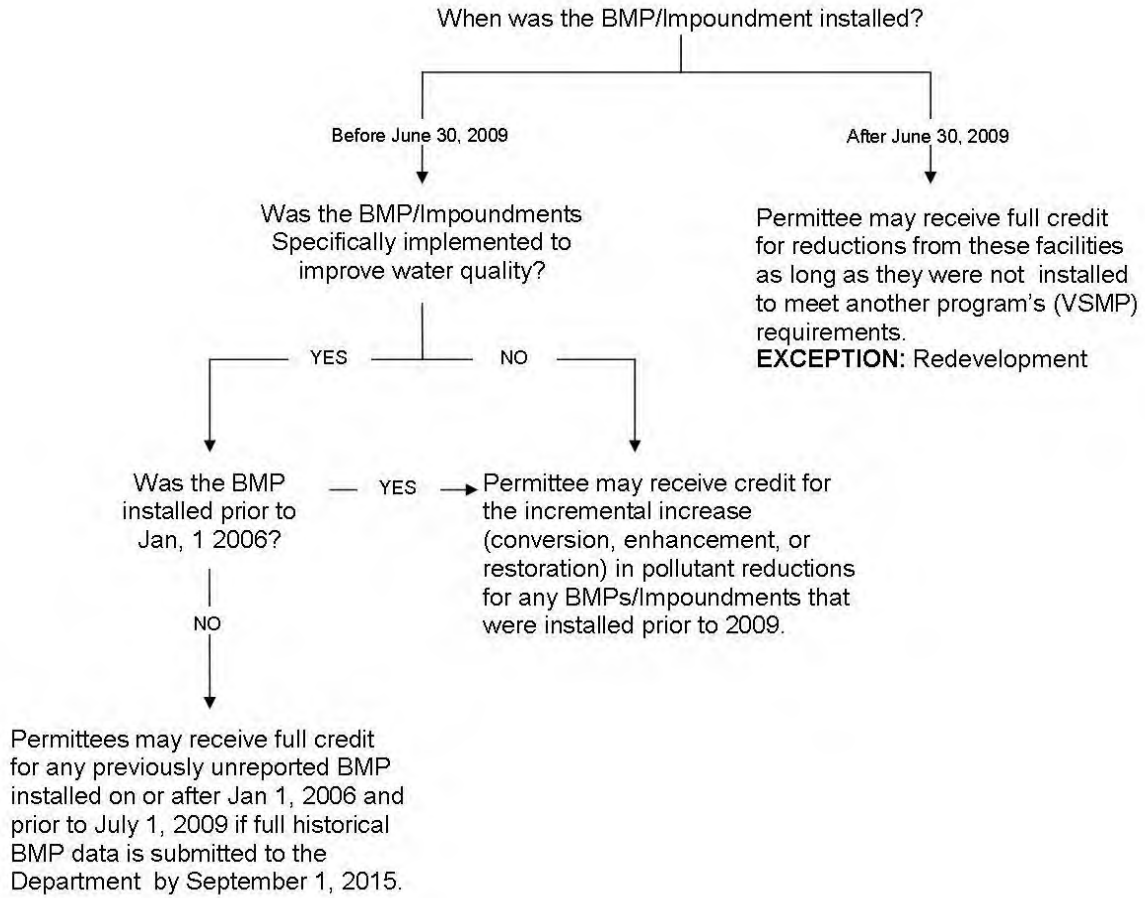
APPENDIX VI – Credit for BMPs installed prior to July 1, 2009

For all BMPs or impoundments that were installed prior to July 1, 2009 permittees may receive credit for any incremental increase in treatment that is the result of an enhancement, conversion, or restoration project. Restoration projects must meet the minimum requirements that are listed in the *Expert Panel to Define Removal Rates for Urban Stormwater Retrofits* to be eligible for credit. Permittees may not receive full credit for BMPs that were installed prior to January 1, 2006, regardless of whether or not they were previously reported to the Department.

Permittees may receive full credit for BMPs that were not previously reported to the Commonwealth, but were initially installed on or after January 1, 2006 and prior to July 1, 2009, if a full account of BMPs throughout the permittees jurisdiction is submitted to the Department as part of the "Historical Data Clean-Up" effort. **Historical BMP data should be submitted to the Department by September 1, 2015**. Please see Part IV.2 of this document for additional information on receiving credit for these BMPs.

A flowchart showing the credit permittees may receive for BMPs installed prior to July 1, 2009 is included below.

Credit for BMPs installed prior to July 1, 2009



APPENDIX VII – REPORTING ELEMENTS

Table VI.1 – Reporting Elements for Individual BMPs

Virginia Stormwater BMP Clearinghouse BMP	
Practice	Reporting Elements
Rooftop Disconnection	Impervious acres disconnected
Sheetflow to Vegetated Filter or Conserved Open Space 1 & 2	Area in acres treated
Grass Channel	area in acres treated by grass channel
Vegetated Roof 1 & 2	area in acres treated by vegetated roof
Rainwater Harvesting	volume of rainwater captured
Permeable Pavement 1	area in acres treated by permeable pavement and upgradient area draining to pavement, so long as it does not exceed a ratio of 2:1
Permeable Pavement 2	area in acres treated by permeable pavement
Infiltration 1 & 2	area in acres treated by infiltration practices
Bioretention 1 & 2, Urban Bioretention	area in acres treated by bioretention practices
Dry Swale 1 & 2	area in acres treated by dry swale
Wet Swale 1 & 2	area in acres treated by wet swale
Filtering Practice 1 & 2	area in acres treated by filtration practices
Constructed Wetland 1 & 2	area in acres treated by constructed wetlands
Wet Pond 1 & 2	area in acres treated by Wet Ponds
Extended Detention Pond 1 & 2	area in acres treated by Extended Detention Ponds
Chesapeake Bay Program BMPs	
Wet Ponds and Wetlands	area in acres treated by Wet Ponds or wetlands
Dry Detention Ponds and Hydrodynamic Structures	area in acres treated by Dry Detention Ponds or Hydrodynamic Structures
Dry Extended Detention Ponds	area in acres treated by Dry Extended Detention Ponds
Infiltration Practices w/o Sand, Veg.	area in acres treated by infiltration practices
Infiltration Practices w/ Sand, Veg.	area in acres treated by infiltration practices
Filtering Practices	area in acres treated by filtration practices
Bioretention C/D soils, underdrain	area in acres treated by bioretention practices
Bioretention A/B soils, underdrain	area in acres treated by bioretention practices
Bioretention A/B soils, no underdrain	area in acres treated by bioretention practices
Vegetated Open Channels C/D soils, no underdrain	area in acres treated by vegetated Open Channels C/D soils, no underdrain
Vegetated Open Channels A/B soils, no underdrain	area in acres treated by vegetated Open Channels A/B soils, no underdrain
Bioswale	area in acres treated by bioswale
Permeable Pavement w/o Sand, Veg. C/D soils, underdrain	area in acres of permeable pavement w/o Sand, Veg. C/D soils, underdrain
Permeable Pavement w/o Sand, Veg. A/B soils, underdrain	area in acres of permeable pavement w/o Sand, Veg. A/B soils, underdrain
Permeable Pavement w/o Sand, Veg. A/B soils, no underdrain	area in acres of permeable pavement w/o Sand, Veg. A/B soils, no underdrain
Permeable Pavement w/Sand, Veg. C/D soils, underdrain	area in acres of permeable pavement w/Sand, Veg. C/D soils, underdrain
Permeable Pavement w/Sand, Veg. A/B soils, underdrain	area in acres of permeable pavement w/Sand, Veg. A/B soils, underdrain
Permeable Pavement w/Sand, Veg. A/B soils, no underdrain	area in acres of permeable pavement w/Sand, Veg. A/B soils, no underdrain

Performance Standard Curve ST or RR, Establishment Retrofit Curve ST or RR, Enhancement Retrofit Curve ST or RR, Restoration Retrofit Curve Pre-restoration condition ST or RR, Restoration Retrofit Curve Post restoration condition ST or RR	total area of runoff collection, impervious area within the total, inches of runoff captured
Wetland Restoration	area in acres of restored wetlands
Stream Restoration	linear feet of stream restoration
Land Use Change BMPs	
Impervious Urban Surface Reduction	area in acres of reduced impervious surface
Forest Buffers	area in acres converted to riparian forest
Grass Buffers	area in acres converted to riparian grasses or herbaceous plants
Tree Planting	area in acres converted to forest

P:\21\10021\162\21162-15\CAD\21162-15_SPEC\21162-15_OVERALL-PLAN.dwg June 30, 2015 4:28:08 PM

OLD BON AIR ROAD

OLD BON AIR PROPERTY LINE

OLD BON AIR ROAD

CHATSWORTH AVENUE – ROUTE 324

CHATSWORTH AVENUE

CHATSWORTH AVENUE

OAK RIDGE FACILITY

A-2 COTTAGE

A-3 COTTAGE

B COTTAGE

A-1 COTTAGE

R.D.C. ADMINISTRATION

R.D.C. DINING

C-1

C-2

C-3

C-4

MEDIUM SECURITY FACILITY

MEDIUM SECURITY FACILITY BASIN

BMP

BMP

PARKING LOT BASIN

CHAPEL

SCHOOL

KELLER COTTAGE

STUART COTTAGE

LIGHT COTTAGE

BUCHANAN COTTAGE

KITCHEN

DINING HALL

PETERSON COTTAGE

NICHOLS COTTAGE

FISHER-JACKSON COTTAGE

CENTRAL INFIRMARY

ADMINISTRATION

GUEST COTTAGE

WAY OUT COTTAGE

OFFICES

Storm MH

Storm DI

Grate DI

NOTES:

1. TOPOGRAPHIC, ROAD & BUILDING INFORMATION SHOWN IS FROM GIS. SELECTED AREAS HAVE BEEN UPDATED TO APPROXIMATE CURRENT CONDITIONS BY REVIEW AGAINST INTERNET BASED AERIAL PHOTOGRAPHY.
2. STORM SEWER IS FROM FIELD SURVEY COMPLETED NOVEMBER 2103 SUPPLEMENTED BY RECORD DRAWINGS PROVIDED BY THE OWNER.

GRAPHIC SCALE

APP 3

PROJECT NUMBER: 21162-15

DATE: JUNE 30, 2015

SCALE: 1" = 80'

CHECKED BY: GHC

DRAWN BY: SKJ

DESIGNED BY: GHT

REVISIONS

APPENDIX 3

STORM SEWER SYSTEM MAP

DJJ BON AIR - CHESAPEAKE BAY TMDL ACTION PLAN

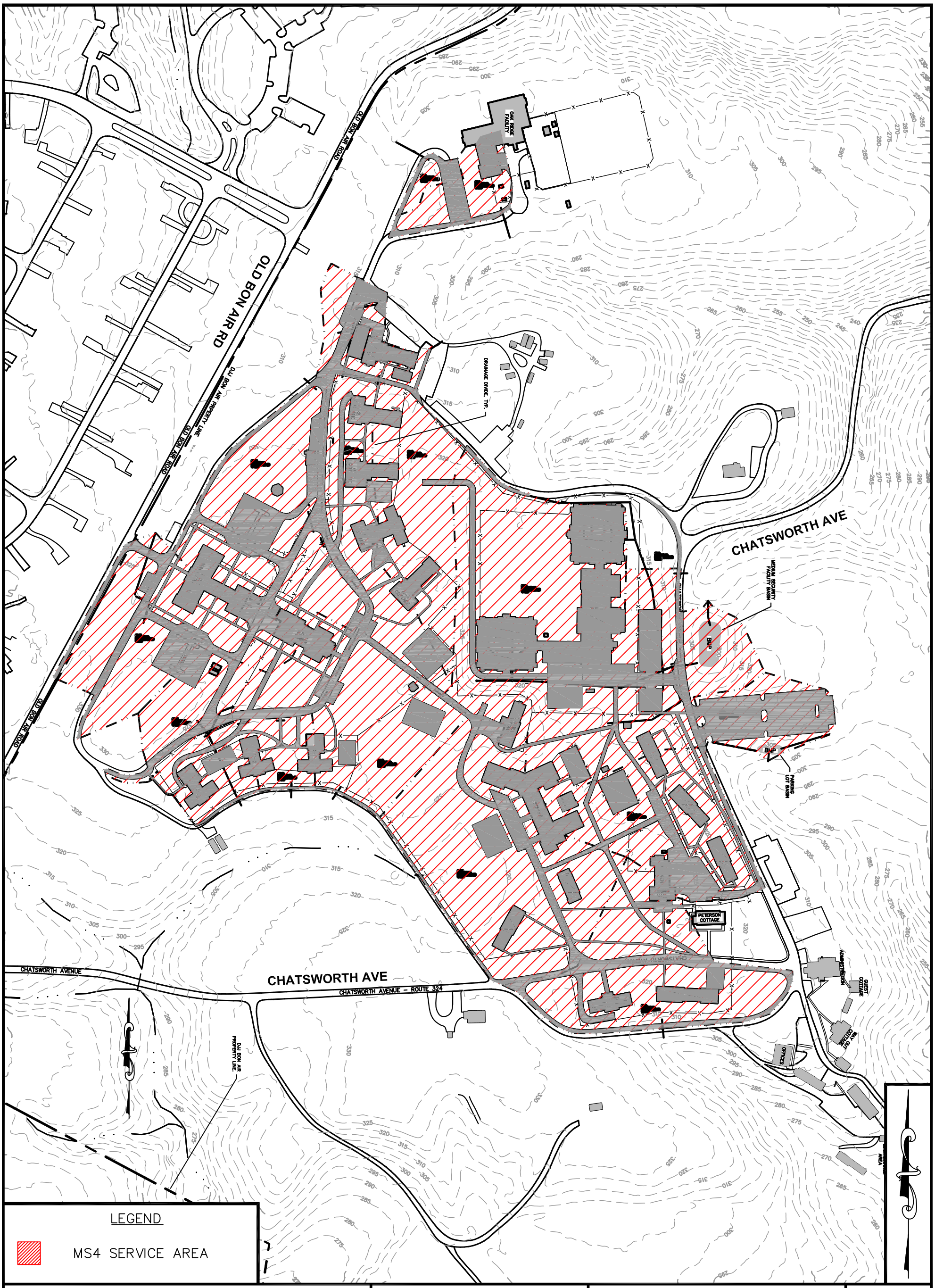
CHESTERFIELD COUNTY, VIRGINIA

Draper Aden Associates

Engineering • Surveying • Environmental Services

Richmond, VA
8090 Villa Park Drive
Richmond, VA 23228
804-264-2228 Fax: 804-264-8773
www.daa.com

Blacksburg, VA
Charlottesville, VA
Hampton Roads, VA



Draper Aden Associates
Engineering • Surveying • Environmental Services
8090 Villa Park Drive
Richmond, VA 23228
804-264-2228 Fax: 804-264-8773
Blacksburg, VA
Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED NRH
DRAWN NRH
CHECKED GHT
DATE JUNE 30, 2015

SCALE: 1" = 250'

PROJECT: 21162-15

APPENDIX
4

MS4 SERVICE AREA & LAND COVER MAP

DJJ BON AIR - CHESAPEAKE BAY TMDL ACTION PLAN

CHESTERFIELD COUNTY, VA

P:\21100\21162\21162-15\CAD\21162-15_SPE\21162-15_MS4_Service_Area.dwg June 30, 2015 4:27:08 PM

Department of Juvenile Justice - Bon Air Facility
Chesapeake Bay TMDL Action Plan
June 30, 2015

APPENDIX 5
WLA & Compliance Calculations

Waste Load Allocation (WLA)

	Imp (Ac)	Perv (Ac)
MS4 Service Area (based on 2009 land cover)	17.21	32.68

Table 2a: Calculation Sheet for Estimating Existing Source Loads for the James River Basin

Subsource	Pollutant	Total Existing Acres Served by MS4 (6/30/2009)	2009 EOS Loading Rate (lbs/ac)	Estimated Total POC Load Based on 2009 Progress Run
Regulated Urban Impervious	Nitrogen	17.21	9.39	161.6
Regulated Urban Pervious		32.68	6.99	228.4
Regulated Urban Impervious	Phosphorus	17.21	1.76	30.3
Regulated Urban Pervious		32.68	0.50	16.3
Regulated Urban Impervious	Total Suspended Solids	17.21	676.94	11,650
Regulated Urban Pervious		32.68	101.08	3,303

Table 3a: Calculation Sheet for Determining Total POC Reductions Required During this Permit Cycle for James River Basin

Subsource	Pollutant	Total Existing Acres Served by MS4 (7/1/09)	First Permit Cycle Requiring Reduction in Loading Rate	Total Reduction Required First Permit Cycle (lbs)
Regulated Urban Impervious	Nitrogen	17.21	0.04	0.7
Regulated Urban Pervious		32.68	0.02	0.7
Regulated Urban Impervious	Phosphorus	17.21	0.01	0.2
Regulated Urban Pervious		32.68	0.002	0.1
Regulated Urban Impervious	Total Suspended Solids	17.21	6.67	115
Regulated Urban Pervious		32.68	0.44	14

Chesapeake Bay TMDL - Required Removals	N (lbs)	P (lbs)	TSS (lbs)
Estimated Total Removal (100%)	28.0	6.0	2,580
Required first period (2018) removal	1.4	0.3	129
Required second period (2023) removal - estimated	9.8	2.1	903
Required third period (2028) removal - estimated	16.8	3.6	1,548

Department of Juvenile Justice - Bon Air Facility
Chesapeake Bay TMDL Action Plan
June 30, 2015

APPENDIX 5
WLA & Compliance Calculations

First Permit Cycle - Compliance Projects (2013-2018)

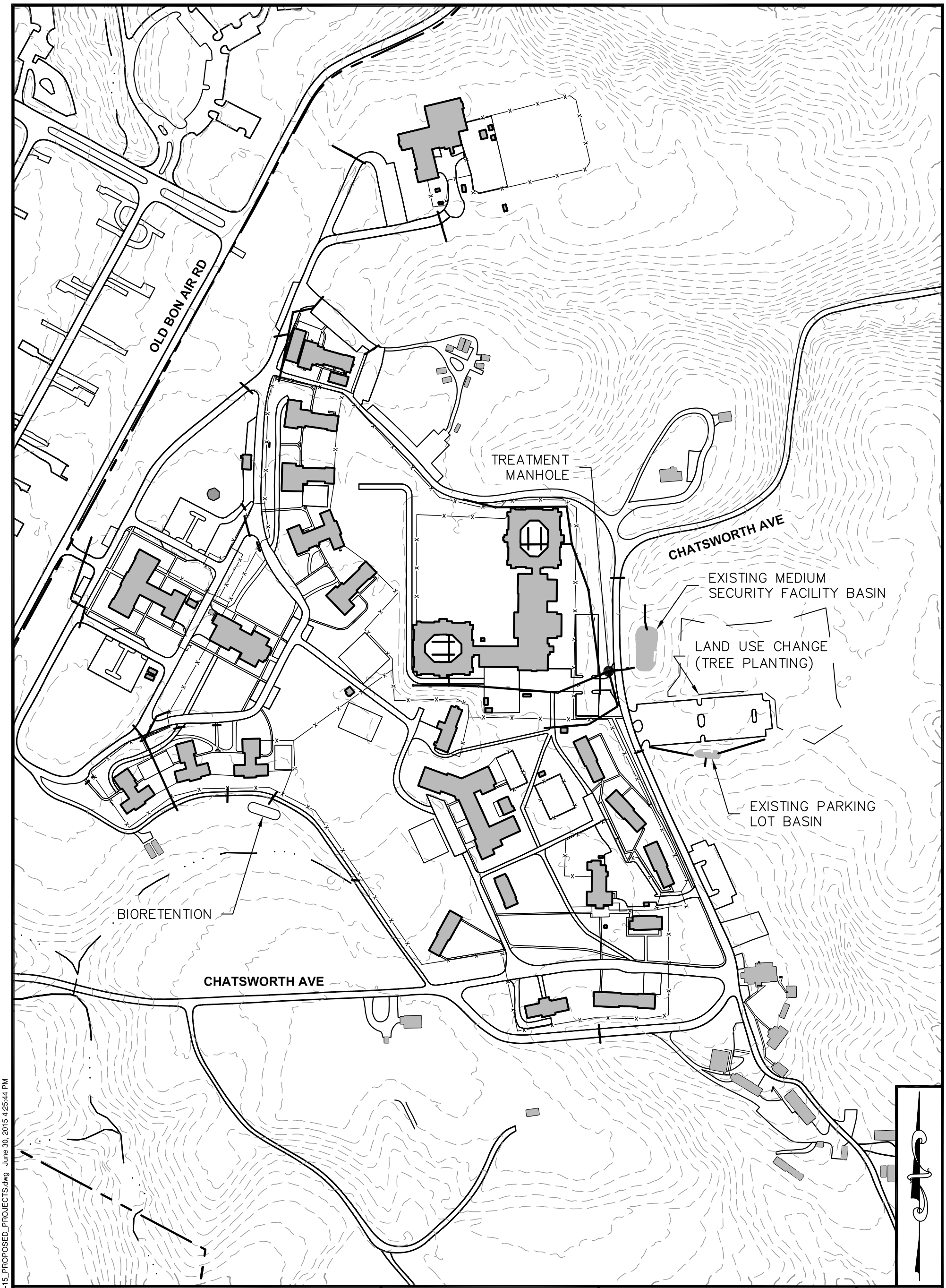
Existing Post 2009 Unreported BMPs (non-regulatory)	Type	Area Treated (Ac)		Efficiences			N (lbs)	P (lbs)	TSS (lbs)
		Imp.	Perv.	N	P	TSS			
Land Use Change	perv. to forest	0	2.25	N/A	N/A	N/A	11.3	1.1	130
TOTALS							**11.3**	**1.1**	**130.1**

Department of Juvenile Justice - Bon Air Facility
Chesapeake Bay TMDL Action Plan
June 30, 2015

APPENDIX 5
WLA & Compliance Calculations

First Permit Cycle - Compliance Projects

Proposed Projects	Type	Area Treated (Ac)		Efficiences			N	P	TSS	Calculation	Remarks
		Imp.	Perv.	N	P	TSS	(lbs)	(lbs)	(lbs)	Methodology	
Building demo	Imp to Perv	0.12	0	N/A	N/A	N/A	0.3	0.2	98.1	Table V.F.1	Administartion, Guest Cottage and conecting sidewalk
Building & Parking demo	imp. to forest	0.11	0	N/A	N/A	N/A	0.8	0.2	96	Table V.F.1	Northen building and parking area
Loop road demo	imp. to forest	0.29	0	N/A	N/A	N/A	2.1	0.6	254	Table V.F.1	Northern Loop Road
Northern BMP	Retrofit	3.84	6.72	20	20	20	16.6	2.0	656	10% per missing design element	Credit for adding forebay & outlet pool
Southern BMP	Retrofit	0.93	0.5	20	20	20	2.4	0.4	136	10% per missing design element	Credit for adding forebay & outlet pool
South of C-1 & C-2	Bioretention	0.12	0.31	64	55	66	2.1	0.2	74	Type 1, BMP Clearinghouse	N & P from BMP Clearinghouse, Assume RD=1.0 st for TSS Curves
South of C-1	Bioretention	0.52	1.13	64	55	66	8.2	0.8	308	Type 1, BMP Clearinghouse	N & P from BMP Clearinghouse, Assume RD=1.0 st for TSS Curves
South Oak Ridge Facility	Bioretention	0.44	0.66	64	55	66	5.6	0.6	241	Type 1, BMP Clearinghouse	N & P from BMP Clearinghouse, Assume RD=1.0 st for TSS Curves
Before Northern BMP	Manufactured	3.84	6.72	33	20	66	27.4	2.0	2,164	Ches Bay Program (Adjustor Curves)	Inline CDS from BMP Clearinghouse, Assume RD=1.0 st for TSS Curve
Land Use Change	perv. to forest	0	1.00	N/A	N/A	N/A	5.0	0.5	58	Table V.F.1	trees planted in existing lawn areas, 400 (min.) seedling per acre
TOTALS							**70.6**	**7.5**	**4,084**		
		Required					**28.0**	**6.0**	**2,580**		



Draper Aden Associates
Engineering • Surveying • Environmental Services
8090 Villa Park Drive
Richmond, VA 23228
804-264-2228 Fax: 804-264-8773
Blacksburg, VA
Charlottesville, VA
Hampton Roads, VA
Coats, NC

DESIGNED NRH
DRAWN NRH
CHECKED GHT
DATE JUNE 30, 2015

SCALE: 1" = 250'

PROJECT: 21162-15

APPENDIX
6

PROPOSED COMPLIANCE PROJECT LOCATION MAP

DJJ BON AIR - CHESAPEAKE BAY TMDL ACTION PLAN

CHESTERFIELD COUNTY, VA

Department of Juvenile Justice - Bon Air Facility
Chesapeake Bay TMDL Action Plan
June 30, 2015

APPENDIX 7
Proposed Compliance Project Budgetary Costs

Summary - Conceptual Estimates of Probable Construction Costs

Proposed Compliance Project		Project Cost in 2015 dollars	Project Cost in 2018 dollars	Project Cost in 2023 dollars	Project Cost in 2028 dollars
Land Use Change - Pervious to Forest		$7,950	$8,561		
Treatment MH		$57,500		$70,058	
Bioretention		$137,308			$189,281
	Total	$202,758			

Inflation rate = 2.5% annually

Cost Estimate Assumptions

All estimates are budgetary only (+/- 25%)
Survey and engineering for each project will be part of a larger project with multiple BMPs

Opinion of Probable Conceptual Costs
Land Use Change - previous to forest

Design

Survey & Engineering	none required

Construction

	Units	Unit Price	Cost
Mobilization & GC	1 LS	$1,200	$1,200
Planting	2.25 Ac	$3,000	$6,750
	TOTAL CONSTRUCTION		**$7,950**

Trees are native species whips planted at 8-9 feet centers (600 per acre) with guard tubes.

Opinion of Probable Conceptual Costs
Treatement Manhole

Design

	Units	Unit Price	Cost
Survey & Engineering	1 LS	$11,500	$11,500

Construction

	Units	Unit Price	Cost
Mobilization & GC	1 LS	$6,000	$6,000
Treatment MH	1 EA	$40,000	$40,000
		DESIGN & CONSTRUCTION TOTAL	**$57,500**

Opinion of Probable Conceptual Costs
Bioretention

Design

	Units		Unit Price	Cost	
Survey, Geotechnical & Engineering	1	LS	$25,000	$25,000	

Construction

	Units		Unit Price	Cost	
Mobilization & GC	1	LS	$6,000	$6,000	
ESC measures	1	LS	$3,000	$3,000	
Excavation & disposal	532	CY	$25	$13,310	
Bioretention, Type 1	2875	SF	$40	$114,998	1.65 Ac Treated
			TOTAL CONSTRUCTION	**$137,308**	