

## Appendix H

**Virginia State University**  
**MS-4 Permit: VAR040119**

**Phase II**  
**Chesapeake Bay TMDL Action Plan**



Prepared for  
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## 1 Introduction

Virginia State University (VSU) has prepared this Chesapeake Bay TMDL Action Plan (Plan) as required by VSU's Municipal Separate Storm Sewer System (MS4) Permit effective November 1, 2023.

To assist with the development of this Plan, VSU has utilized Part II Section 11 (TMDL Special Conditions) of the Permit and the Department of Environmental Quality's (DEQ) Chesapeake Bay TMDL Special Condition Guidance Document (Guidance Memo No. 15-2005). VSU also utilized the Virginia Geographic Information Network (VGIN), and Virginia Environmental Geographic Information Systems (VEGIS) coupled with campus GIS data to meet the technical requirements of this Plan.

The focus of this Plan is driven by the Chesapeake Bay Total Maximum Daily Load (TMDL), which was approved by the US Environmental Protection Agency (EPA) in December of 2010. Nitrogen and Phosphorous are the Pollutants of Concern (POC) driving the need for required pollutant reductions in the Chesapeake Bay watershed, in which the entire VSU campus is included.

Three permit cycles have been adopted to address the percent pollutant reduction required by a Municipal Separate Storm Sewer System (MS4) in Virginia. A 5% POC load reduction was required by the end of the first permit cycle on June 30, 2018, followed by a 35%, and 60% reduction in the following 2 cycles, respectively. This plan details the action plan for achieving the total 60% reductions (100% cumulative).

VSU may modify this Plan during the permit cycle to include new opportunities for reductions or address projects that are deemed infeasible.

## 2 New or Modified Legal Authorities

VSU's relevant existing legal authorities and policies are listed below:

- MS4 Program Plan
- Illicit Discharge Detection and Elimination Policy
- Annual Standards and Specifications for Erosion and Sediment Control and Stormwater Management
- Stormwater Master Plan

Based on the review of items listed above, VSU has no new or modified legal authorities such as ordinances, state and other permits, orders, specific contract language and/or inter-jurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition.

VSU intends to continue coordinating with Chesterfield County (adjacent MS4) to clarify inter-jurisdictional responsibilities for POC loads and subsequent required POC load reductions.



### **3 Load and Cumulative Reduction Calculations**

#### **3.1 2009 Baseline Land Cover**

Land cover types were delineated using VSU's GIS data, construction plans, and 2009 VGIN aerial imagery. Open waters and forested lands were considered unregulated area and were excluded from the load calculations. Areas that meet the tree density requirements of Guidance Memo 15-2005, Appendix V.H (undeveloped and a minimum area of 900 square meters) were considered forested land cover.

Figure 3-1 shows VSU's regulated MS4 area and the 2009 baseline land cover within the regulated area. The figure also includes a table with the acreage and overall percentage of each land cover type (impervious, pervious, forested and open water).

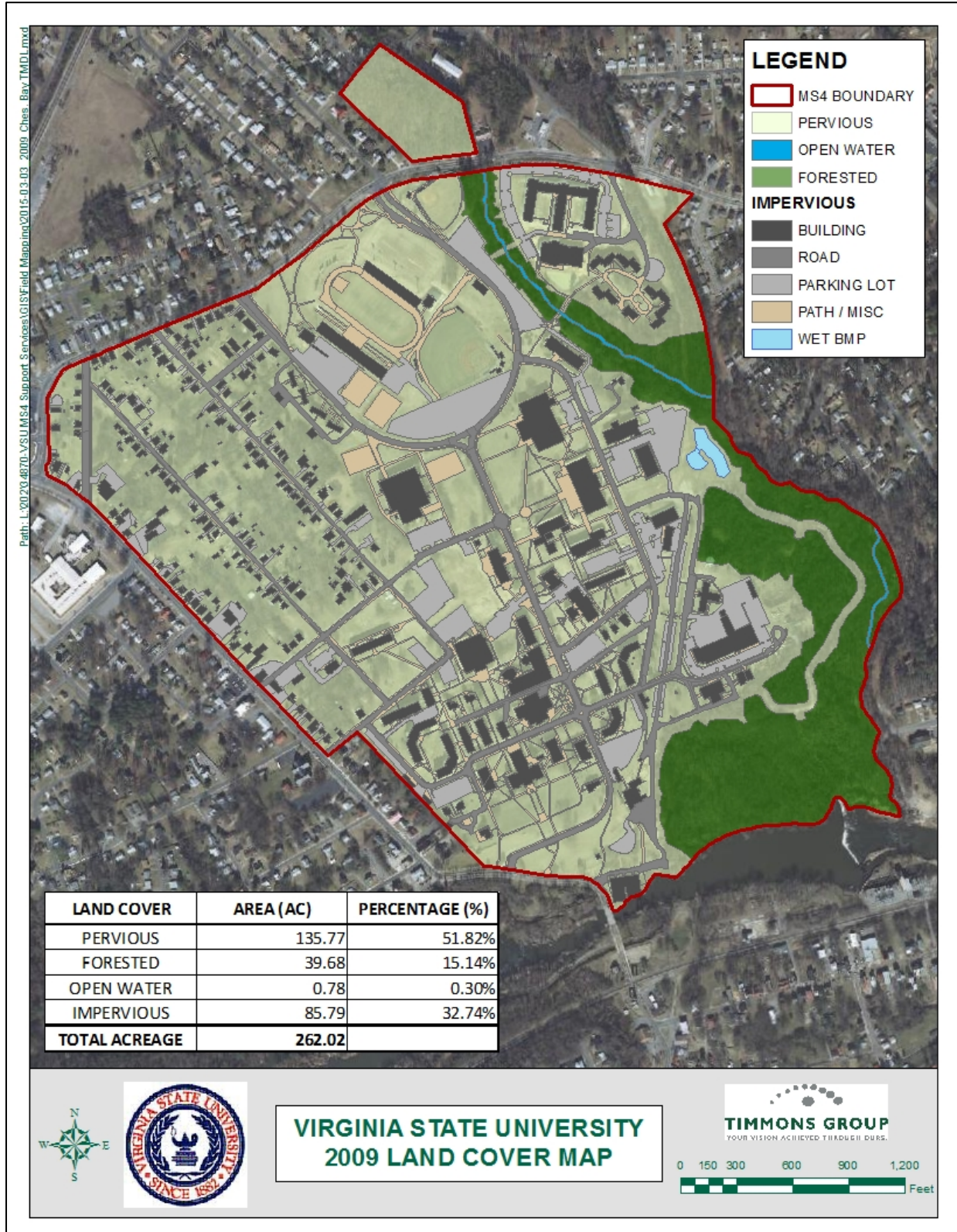


Figure 3-1: 2009 Baseline Land Cover and Regulated MS4 Area



### 3.2 Calculations

Table 3-1 presents the pollutant load based on VSU's 2009 baseline cover and the required reductions to meet 100% of the L2 Scoping Run, per the permit.

<b>Table 3a: Calculation for Estimating Total Reduction Required</b>							
		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>Subsource</b>	<b>Pollutant</b>	<b>Loading Rate (lbs/ac/yr)</b>	<b>Existing developed lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)</b>	<b>Load (lbs/yr)</b>	<b>Percentage of MS4 Required Chesapeake Bay total L2 loading</b>	<b>100% Cumulative Reduction Required by 10/31/2028 (lbs/yr)</b>	<b>Sum of Cumulative Reduction (lbs/yr)</b>
Regulated Urban Impervious	Nitrogen	9.39	85.79	806	9%	73	<b>129</b>
Regulated Urban Pervious	Nitrogen	6.99	135.77	949	6%	57	
Regulated Urban Impervious	Phosphorus	1.76	85.79	151	16%	24	<b>29</b>
Regulated Urban Pervious	Phosphorus	0.5	135.77	68	7.25%	5	

1 – Edge of stream loading rate based on the Chesapeake Bay Watershed Model Progress Run 5.3.2.  
 2 – To determine the existing developed areas required in Column B, first determine the extent of the regulated service area based on the 2010 Census urbanized area (CUA). Next, delineate the lands within the 2010 CUA served by the MS4 as pervious or impervious as of the baseline data of June 30, 2009.  
 3 – Column C = Column A x Column B.  
 4 – Column E = Column C x Column D  
 5 – Column F = The sum of the subsource cumulative reduction required by 10/31/2028 (lbs/yr) as calculated in Column E.  
 6 – Per MS4 permit requirements, loading and reduction values greater than or equal to 10 pounds have been calculated and reported to the nearest pound. Loading and reduction values less than 10 pounds have been calculated and reported to two significant digits.



## 4 Chesapeake Bay TMDL Compliance Strategy

On June 26, 2019, VSU submitted a letter to DEQ documenting progress toward Chesapeake Bay TMDL POC reduction compliance, included as an Attachment A. As stated in the letter, VSU had initially targeted two segments of stream on campus for restoration but has since narrowed focus to a portion of Fleets Branch. The Fleets Branch Phase I stream restoration project was completed in September 2020.

### 4.1 Achieved POC Reductions

VSU conducted an initial assessment in accordance with the Bank Assessment for Non-point Source Consequences of Sediment (BANCS) protocol outlined in the *Recommendations of the Expert Panel to Define Removal Rates for Individual Stream Restoration Projects (2013)* in order to calculate TMDL credit for restoring the stream.

The results of the BANCS assessment for the segment of Fleets Branch concluded that both BEHI and NBS were rated to have a relatively high erosion potential. An erosion rate was derived from the erosion potential ratings and pollutant removal was determined based on a 50% stream restoration efficiency and adjustments based on land coverage. The pollutant removal credit summary is presented below in **Table 4-1**.

Project	Phase	Total Nitrogen (lbs/yr)	Total Phosphorus (lbs/yr)
Fleet's Branch Restoration	Phase I	351.84	81.85
Fleet's Branch Restoration	Phase II	427.40*	109.63*
<b>Total</b>		<b>779.24</b>	<b>191.48</b>

\*Pollutant removals reflect adjustments per DEQ review.

VSU has implemented Phase I of the Fleet's Branch Restoration project and has satisfied pollutant removal requirements for compliance with the Chesapeake Bay TMDL. VSU reserves the right to share the remaining credits and implementation costs of the project with adjacent MS4s. VSU is coordinating a partnership with the City of Petersburg for implementation of Phase II of the project. The TMDL Action Plan may be revised to account for changes in crediting, guidance, and permit requirements.

## 5 Summary of Comments Received as a Result of Public Participation

VSU has not received any formal public comment.