Chesapeake Bay TMDL Action Plan Draft Phase 3

Norfolk State University

Chesapeake Bay TMDL Action Plan Draft Phase 3
Project No. 177124

11/7/2024

Chesapeake Bay TMDL Action Plan Draft Phase 3

prepared for

Norfolk State University
Chesapeake Bay TMDL Action Plan Draft Phase 3
Norfolk, Virginia

Project No. 177124

Revision 0
11/7/2024

prepared by

Burns & McDonnell Engineering Company, Inc.
Chesapeake, Virginia

TABLE OF CONTENTS

Page No.

TABLES

Page No.

1.0 GENERAL INFORMATION

The general information for this annual report is as follows:

1. The permittee is Norfolk State University, and the permit number is VAR040097.
2. The reporting period for which this action plan is being submitted is from October 1, 2023 to October 1, 2028.
3. The MS4 Map and Information Table have been updated to reflect any change to the MS4 that occurred on or before October 1, 2023.

2.0 SIGNED 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.".

_____ _____

Date Signature

Terry Woodhouse, Associate Vice President Facilities Management

3.0 INTRODUCTION

3.1 Purpose

This Chesapeake Bay TMDL Action Plan documents how NSU (Norfolk State University) has met the "Special Condition for the Chesapeake Bay TMDL" in Part II, Section A of the University's General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4) for Phases 1 and 2 and this action plan will provide a viable path forward for the University to attain the necessary reductions needed to comply with the Chesapeake Bay TMDL's phase 3 100% cumulative reductions as required to renew the university's MS4 permit.

NSU's MS4 permit (VAR040097) was issued by the VA DEQ effective October 1, 2023 and will expire October 1, 2028.

The MS4 permit requires the development of a Total Maximum Daily Load (TMDL) action plan to treat and reduce established Pollutants of Concern (POC). POCs as identified by the Virginia Department of Environmental Quality include Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS). Based on previous phase developments, it has been shown that plans implemented to reduce TN and TP will also exceed the required reduction of TSS. Therefore, any additional calculations for the removal of TSS solids will not be required for the third phase of the action plan.

The Watershed Implementation Plan (WIP) established by the Virginia Department of Environmental Quality establishes the phased approach needed by MS4 permit holders to meet the Chesapeake Bay TMDL over three five-year permit cycles. The plan is established in three separate phases, Phase 1 requires 5% reduction of POCs, Phase 2 requires 40% reduction of POCs and Phase 3 will require the remaining 60% reduction in POCs to reach a cumulative 100% reduction.

This Chesapeake Bay TMDL Action Plan serves as a draft for the 100% cumulative reduction target as required by the 2023 MS4 Registration Statement for MS4 permit renewal. This action plan establishes how the university has met the 40% reduction target for the second permit cycle, details the means and methods used to achieve the current reductions, and details the methods that will be used in the future, as per the Chesapeake Bay TMDL Special Conditions Guidance (Guidance Memo 20-2003 dated 2-8-2021).

3.2 Permit Compliance

Table 3.2.1 provides each of the requirements of NSU's MS4 permit as shown in the Chesapeake Bay TMDL Special Conditions Guidance (Guidance Memo 20-2003 dated 2-8-2021). This action plan will be updated following the finalization of the Phase 3 requirements set by the Virginia DEQ.

Table 3.2.1 – Action Plan and Permit Compliance Crosswalk

Element from DEQ TMDL Special Condition Guidance	MS4 Permit	MS4 Permit Requirement
Part VI.1 – Current Program and Existing Legal Authority	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.
Part VI.2 – New or Modified Legal Authority	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 inter-jurisdictional agreements implemented or needing to be implemented to meet the requirements of this special condition.
Part VI.3 – Means and Methods to Address Discharges from New Sources	Section I.C.2.a(3)	The means and methods that will be utilized to address discharges into the MS4 from new sources.
Part VI.4 – Estimated Existing Source Loads and Calculated Total Pollutants of Concern (POC) Required Reductions	Section I.C.2.a(4) and 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 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. 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 purpose 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.
Part VI.5 – Means and Methods to Meet the Required Reductions and Schedule	Section I.C.2.a(6)	The means and methods, such as best 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.
Part VI.6 – Means and Methods to Offset Increased Loads from New Sources Initiating Construction between July 1, 2009 and June 30, 2014	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

Element from DEQ TMDL Special Condition Guidance	MS4 Permit	MS4 Permit Requirement
		shall utilize Table 4 in this section to develop the equivalent pollutant load for nitrogen and total suspended solids. The operator shall offset 40.0% of the calculated increased load from these new sources during the permit cycle.
Part VI.7 – Means and Methods to Offset Increased Loads from Grandfathered Projects that Begin Construction after July 1, 2014	Section I.C.2.a(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.
Part VI.8 – List of Future Projects, and Associated Acreage that Qualify as Grandfathered	Section I.C.2.a(10)	A list of future projects and associated acreage that qualify as grandfathered in accordance with 4VAC50-60-48.
Part VI.9 – Estimated Expected Cost to Implement Necessary Reductions	Section I.C.2.a(10)	An estimate of the expected costs to implement the requirements of this special condition during the state permit cycle.
Part VI.10.a&b – Public Comments on Draft Action Plan	Section I.C.2.a(12)	An opportunity for receipt and consideration of public comment regarding the draft Chesapeake Bay TMDL Action Plan. 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.

4.0 CURRENT PROGRAM AND LEGAL AUTHORITY

4.1 Current Program and Existing Legal Authority

NSU created and implemented a new MS4 Program Plan during 2021. This plan demonstrates all the requirements to meet the MS4 permit. Table 4.1.1 summarizes the six minimum control measures (MCMs) implemented by NSU.

Table 4.1.1 – MS4 Program Plan Components Related to Meeting the Chesapeake Bay TMDL

Minimum Control Measure	MS4 Program Plan Elements Related to Controlling Total Nitrogen, Total Phosphorus, and Total Suspended Solids
Public Education and Outreach on Stormwater Impacts.	This measure requires the University to educate the public about the potential impact of stormwater discharges on natural bodies of water, and the precautions to be taken to reduce pollutants in stormwater runoff. The University considers the public as all members of the campus community along with contractors and visitors to academic and athletic events. The means of communication may vary relative to the intended recipients Staff /personnel receive work orders that directly address physical conditions that can be the source of stormwater pollutants. Students are engaged with emails and flyers with information regarding stormwater runoff and they are encouraged to attend and organize trash pickup events.
Public Involvement and Participation	This measure requires the University to encourage the public to become involved in the protection of stormwater runoff and related sewer systems. As a State University and a campus open to the general public, NSU has provided program basics on its website, conferred with faculty, and made presentations to students. Multiple BMPs are associated with this Minimum Control Measure.
Illicit Discharge Detection and Elimination	Norfolk State University (NSU) is committed to the environmental safety and protection of the campus community. The purpose of this policy is to provide for the protection of the environment at NSU, and the surrounding areas, through the regulation of non-stormwater discharges to the storm drainage system to the maximum extent practicable as required by federal, state, and local law. This policy establishes MS4 to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process, as implemented through the Virginia Stormwater Management Program (VSMP) permit for NSU. This policy contains detailed information regarding requirements for MS4 storm system maintenance. Norfolk State University (NSU) is the owner and operator of a registered small municipal separate storm sewer system (MS4) conveyance system which encompasses approximately 138 acres. A Stormwater Quality and Quantity Management Study was developed for the University by Vanasse, Hangen, Brustlin, Inc. in 2009 and revised in 2018 by Burns and McDonnell. This policy contains detailed information regarding requirements for MS4 storm system maintenance.
Construction Site Stormwater Runoff Control	The University has adopted state mandated procedures to reduce pollutants in stormwater runoff from entering the stormwater inlets on campus during construction projects. Since July 1, 2009, Virginia Stormwater Management Laws have changed. Higher education institutions will continue to have stormwater management plans reviewed by DEQ; however, DEQ will no longer review Erosion and Sediment Control Plans. The two options for Erosion and Sediment Control review are: implementation of an internal Erosion and Sediment Control review process, or review by the locality. NSU elected to implement an internal review process.
Post-Construction Stormwater Management	The University shall develop, implement, and enforce procedures to address stormwater runoff from completed construction sites. Multiple BMPs are associated with this Minimum Control Measure. All BMPs defined under this measure shall be implemented beginning in the first permit year.
Pollution Prevention and Good Housekeeping for Municipal Operations	The University has been performing functions that contribute to the prevention of pollutants from entering stormwater inlets and adversely affecting the natural environment. Potential sources of stormwater pollution include oil/grease stains in parking lots, fuel spills, lawn & garden nutrients on pavement, exposed bulk storage piles and common floatable trash. It is recognized that greater documentation, training, and expansion in some areas will contribute to an increase in the efficiency of the overall program. The University has developed a Stormwater Pollution Prevention Plan (SWPPP) that highlights the high priority facilities that have a high potential to discharge pollutants into the stormwater system. Currently, NSU's Facilities Management Building and Transportation Yard has been identified as a high potential area, the SWPPP was developed around the need to mitigate these potential pollutants. Annually the campus will be evaluated and the SWPPP will be updated with any new areas of that have been identified. Multiple BMPs are

Minimum Control Measure	MS4 Program Plan Elements Related to Controlling Total Nitrogen, Total Phosphorus, and Total Suspended Solids
	associated with this Minimum Control Measure. All BMPs defined under this measure shall be implemented beginning in the first permit year.

4.2 New or Modified Legal Authority

No additional legal authorities are required for compliance with the current NSU MS4 Program Plan.

5.0 ESTIMATING EXISTING SOURCE LOADS AND NEW SOURCE LOADS

5.1 Estimating Existing Source Loads in 2009

The following sections describe the methodology used by NSU to estimate existing POC source loads. In accordance with the MS4 permit, NSU must estimate the annual POC loads discharged from existing sources as of June 30, 2009, based on the 2009 Chesapeake Bay Model progress run and using 2009 Edge of Stream (EOS) loading rates. Completed calculation tables from the permit are included in Table 5.1.1 below.

Table 5.1.1- Estimated Existing Total POC Load 2009

Sub Source	Pollutant	Total Acres Served by MS4 6/30/09	EOS Loading Rate (lbs/ac/yr)	Estimate Total POC Load (lb/yr)	
Impervious	Nitrogen	68.65	9.39	644.62	1,131.20
Pervious		69.61	6.99	486.57	
Impervious	Phosphorous	68.65	1.76	120.82	155.63
Pervious		69.61	0.5	34.81	
Impervious	TSS	68.65	676.94	46471.93	53,508.11
Pervious		69.61	101.08	7036.18	

5.2 Phase 1 and Phase 2 New Source Loads

Between June 30, 2009, and October 1, 2023, there was an increase in the impervious acreage on the University's campus. With the addition of a new building and the redevelopment of several other buildings, the impervious acreage on campus increased by 2.20 acres. Table 5.2.1 below shows the total reductions required in Phase 2 to offset these developments.

Table 5.2.1- Estimated Phase 1 and Phase 2 New Source POC Load

A	B	C	D	E	
Sub Source	**Pollutant**	**Total Acres Served by MS4 6/30/09**	**EOS Loading Rate (lb./ac/yr)**	**Estimate Total POC Load (lb./yr)**	
Impervious	Nitrogen	2.20	9.39	20.66	5.28
Pervious		-2.20	6.99	-15.38	
Impervious	Phosphorous	2.20	1.76	3.87	2.77
Pervious		-2.20	0.5	-1.10	
Impervious	TSS	2.20	676.94	1489.27	1266.89
Pervious		-2.20	101.08	-222.38	

5.3 MS4 Service Area Delineation Methodology

The NSU campus property and Storm Water Master Plan were used to delineate the MS4 boundary. Break points between NSU's drainage system and the City of Norfolk were established by engineers and planners by using artificial conveyances and natural drainage features.

NSU's stormwater system connects to the City of Norfolk's system at 12 outfall locations. This system is then later discharged into the Elizabeth River. See Map 1 for the outfall locations.

The City of Norfolk has been notified of all interconnections with the NSU MS4.

5.4 Pervious and Impervious Surface Delineation Methodology

The NSU Campus ACAD Stormwater Master Plan was used to determine NSU's regulated urban impervious and regulated urban pervious acres. The plan details all the impervious areas including buildings, roads, parking lots, sidewalks, recreational surfaces, and other similar features located on the campus.

The ACAD Stormwater Master Plan from 2009 was utilized to determine the impervious cover features within the MS4 boundary. Regulated pervious acres were calculated by subtracting the regulated impervious acres from the total MS4 acres. The Master Plan is continually updated as new developments take place. See Map 1 for the University's MS4 boundary.

6.0 MEANS AND METHODS TO ADDRESS DISCHARGES FROM EXISTING AND NEW SOURCES FOR PHASE 1 AND PHASE 2

New sources are considered any land disturbance of one acre or greater and utilize a land cover condition greater than 16% impervious post development area. In 2009, the average utilized land cover condition at

NSU was 49.65%. The current average utilized land coverage at NSU established in 2023 is 51.24%. This change in land use results in less than 16% increase in impervious development so the 2009 loading rates were used for the new source load offsets. The total offsets required for Phases 2 is detailed in section 6.1.

NSU utilizes storm water quality requirements from the Norfolk City Code Chapter 41.1 "Stormwater Management". These requirements meet or exceed the state minimum requirements for discharges from new sources. DEQ approved NSU as a Virginia Stormwater Management Program in May 2013. These new requirements that went into effect July 1, 2014 meet the requirements of the Virginia Stormwater Management Act, Erosion and Sediment Control Act and the Chesapeake Bay Preservation Act.

6.1 Summary of Required Reductions and Means and Methods Used to Achieve Phase 2 Reductions

Phase 2 reductions from existing source loads are shown in Table 6.1.1 and were calculated using Table 3a from the GM20-2003 "Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for James River Basin."

Table 6.1.1 - Existing Source Loads and Reduction Requirements

A	B	C	D	E		F	G	H	
Sub Source	**Pollutant**	**Total Acres Served by MS4 6/30/09**	**EOS Loading Rate (lb./ac/yr)**	**Estimate Total POC Load (lb./yr)**		**Percent of MS4 required Chesapeake Bay Total L2 Loading Reduction**	**Percent of L2 required by 6/30/2023**	**Total Reduction Required Second Permit Cycle (lb./yr)**	
Impervious	Nitrogen	68.65	9.39	644.62	1,131.20	9%	40%	23.21	34.88
Pervious		69.61	6.99	486.57		6%	40%	11.68	
Impervious	Phosphorous	68.65	1.76	120.82	155.63	16%	40%	7.73	8.74
Pervious		69.61	0.5	34.81		7.25%	40%	1.01	
Impervious	TSS	68.65	676.94	46471.93	53,508.11	20%	40%	3717.75	3,964.02
Pervious		69.61	101.08	7036.18		8.75%	40%	246.27	

Phase 2 also accounts for any new source loads on campus. There was an increase in the impervious acreage on the University's campus from the addition of a new building and the redevelopment of several other buildings of 2.20 acres. Table 6.1.2 below shows the total reductions required in Phase 2 to offset these developments.

Table 6.1.2 - Summary of Reduction Requirements from Implemented Redevelopments for Second Phase

A	B	C	D	E		F	G	H	
Sub Source	**Pollutant**	**Total Acres Served by MS4 6/30/09**	**EOS Loading Rate (lb./ac/yr)**	**Estimate Total POC Load (lb./yr)**		**Percent of MS4 required Chesapeake Bay total L2 Loading Reduction**	**Percent of L2 required by 6/30/2028**	**Total Reduction Required Second Permit Cycle (lb./yr)**	
Impervious	Nitrogen	2.20	9.39	20.66	5.28	9%	40%	0.74	0.37
Pervious		-2.20	6.99	-15.38		6%	40%	-0.37	
Impervious	Phosphorous	2.20	1.76	3.87	2.77	16%	40%	0.25	0.22
Pervious		-2.20	0.5	-1.10		7.25%	40%	-0.03	
Impervious	TSS	2.20	676.94	1489.27	1266.89	20%	40%	119.14	111.36
Pervious		-2.20	101.08	-222.38		8.75%	40%	-7.78	

NSU implemented and planned stormwater management projects as means and methods to meet required reductions; (see Map 1 for BMP locations).

With the combined reduction requirements for Phase 2 and the increase in impervious acreage from implemented developments on campus, the total reductions required are provided in Table 6.1.3 along with a summary of the reductions achieved during Phase 2 using BMPs. Table 6.1.3 demonstrates how the University will have an excess of credits after Phase 2 that can be applied to the reductions necessary for Phase 3 from street sweeping and BMPs.

Table 6.1.3 – Summary of Phase 2 Reductions

A	B	C	D	E	F
Pollutant	**Reduction Required (Table 6.1.1 H and Table 6.1.2 H) (lb./yr)**	**Reduction Achieved with Prior Implemented BMPs in Phase 1 and Phase 2 (lb./yr)**	**Reduction Achieved with Retrofitted BMPs in 2023 Reporting Year (lb./yr)**	**Total Reduction Achieved Phase 1 and Phase 2 (C+D) (lb./yr)**	**Excess Reductions End of Phase 2 (A-E) (lb./yr)**
Nitrogen	35.26	66.67	10.40	77.06	(41.80)
Phosphorous	8.96	10.90	1.72	12.62	(3.66)
TSS	4075.38	5359.89	922.99	6282.88	(2207.50)

7.0 MEANS AND METHODS TO ADDRESS DISCHARGES AND SOURCE LOADS FOR PHASE 3

This section details the means and methods by which NSU will achieve the 100% reductions required for source loads. Phase 1 and 2 required a cumulative reduction of 40% to the POC discharges. Phase 3 requires a 60% reduction of POCs to achieve 100% total reductions. The 60% reduction is calculated using Table 3a of the MS4 permit (Part II A.3).

7.1 Required Reductions from Source Loads for Phase 3

The required reductions for Phase 3 are demonstrated in Table 7.1.1 below. The reductions for TSS will not be reported as any methods used to reduce TN and TP will result in adequate removal of TSS.

Table 7.1.1 – Required Reductions for Phase 3

A	B	C	D	E		F	G	H		I	J
Sub Source	**Pollutant**	**Total Acres Served by MS4 06/30/2023**	**EOS Loading Rate (lb./ac/yr)**	**Estimate Total POC Load (lb./yr)**		**Percent of MS4 Required Chesapeake Bay Total L2 Loading Reduction**	**Percent of L2 Required by 6/30/2028**	**Total Reductions Required Third Permit Cycle (lb./yr)**		**Excess Reductions Achieve Ph1 and 2**	**Total Credits to Purchase**
Impervious	Nitrogen	70.85	9.39	665.28	1136.48	9%	60%	35.93	52.89	-41.80	11.09
Pervious		67.41	6.99	471.20		6%	60%	16.96			
Impervious	Phosphorous	70.85	1.76	124.70	158.40	16%	60%	11.97	13.44	-3.66	9.78
Pervious		67.41	0.5	33.71		7.25%	60%	1.47			

NSU will implement the following means and methods to meet these reductions:

- NSU's credit for implemented and planned stormwater management projects;
- Purchase of credits from nutrient bank;
- Street sweeping.

7.2 Street Sweeping

NSU implemented a street sweeping program to help meet required POC reductions. Pollutant load reductions generated by annual practices, such as street sweeping need to be calculated and applied annually. In 2014 NSU reported collecting approximately 2,400 pounds of debris. The University has maintained and will continue to maintain this level of effort. NSU continues to perform this practice as recommended. Table 7.2.1 below shows an example of reductions from street sweeping based on the reductions achieved in 2014.

Table 7.2.1 – Summary of Reductions from Street Sweeping

Pollutant	Pounds of Debris Collected	Dry Weight Factor	Dry Pounds Collected	Removal Efficiency	Pollutant Reduction (lbs)
Total Nitrogen	2400	0.7	1680	0.0025	4.2
Total Phosphorus	2400	0.7	1680	0.001	1.68
Total Suspended Solids	2400	0.7	1680	0.3	504

The University will continue to record the reductions achieved annually from street sweeping.

7.3 Planned Redevelopment Credits for Phase 3

The University is pursuing decommissioning four BMPs on campus. Three of the four decommissioned BMPs will be considered for retrofit. The possible reductions from any retrofitted BMPs in Phase 3 are not included in any of the calculations below as it is not certain that they will be viable.

7.4 Means And Methods to Offset Increased Loads from New Sources for Phase 3

The final third phase must calculate any new POC loads that result from any construction that takes place during Phase 3 and must achieve a 100% reduction of new loads during the permit cycle. The University will be purchasing credits from a nutrient bank to achieve the reductions necessary for Phase 3.

7.5 Estimated New Source Loads Phase 3

Phase 3 also accounts for any new source loads on campus. Any new POC loads that were due to water quality requirements less stringent than 16% impervious cover must be considered. In accordance with DEQ guidance, the simple method will be used to determine the excess POCs that need to be offset. During Phase 3, there will be an increase in the impervious acreage on the University's campus from the addition of a new science building. With the addition of a new building, the impervious acreage on campus will increase by 3.92 acres. Table 7.5.1 below shows the total reductions required in Phase 3 to offset these developments.

Table 7.5.1 – Reduction Required from Additional New Source Loads for Phase 3

A	B	C	D	E		F	G	H	
Sub Source	**Pollutant**	**Total Acres Served by MS4 6/30/09**	**EOS Loading Rate (lbs/ac/yr)**	**Estimate Total POC Load (lb/yr)**		**Percent of MS4 required Chesapeake Bay total L2 Loading Reduction**	**Percent of L2 required by 6/30/2028**	**Reduction Required Third Permit Cycle (lbs/yr)**	
Impervious	Nitrogen	3.92	9.39	36.81	9.41	9%	100%	3.31	1.67
Pervious		-3.92	6.99	-27.40		6%	100%	-1.64	
Impervious	Phosphorous	3.92	1.76	6.90	4.94	16%	100%	1.10	0.96
Pervious		-3.92	0.5	-1.96		7.25%	100%	-0.14	

With the combined reduction requirements for Phase 3 from existing POC sources and the increase in impervious acreage from the construction of the new science building on campus, the total reductions required are provided in Table 7.5.2 for Phase 3.

Table 7.5.2 – Summary of Phase 3 Required Reductions

A	B	C	D	E	F
Pollutant	**Reduction Required from Existing Sources (Table 7.1.1H) (lb./yr)**	**Reduction Required from New Source Loads (Table 7.4.1 H) (lb./yr)**	**Total Phase 3 Reductions Required (B+C) (lb./yr)**	**Excess Credits from Phase 2 (Table 6.1.3 F) (lb./yr)**	**Leftover Credits Required for Phase 3 (D+E) (lb./yr)**
Nitrogen	52.89	1.67	54.56	(41.80)	12.76
Phosphorous	13.44	0.96	14.40	(3.66)	10.74

8.0 PLANNED BMPS FOR THE NEXT PERIOD

The University plans to decommission four of the BMPs on campus in the upcoming period. The BMPs to be decommissioned are BMPs 1 and 3 (Bioretention cells), BMP 17 (Infiltration), and BMP 18 (Infiltration).

- To replace the credits that BMP 1 and 3 Bioretention cells at the student center achieve, two options have been created.
    - Option 1: Decommission and buy credits to compensate for the loss in reductions which would need to replace 10.38 TN credits and 1.25 TP credits. See Appendix C for calculations.
    - The second option is to close the two BMPs and turn them into underground detentions. The underground detention retrofits would achieve 8.56 TN credits and1.30 TP credits. While this is less than what the Bioretentions currently achieve, these retrofits are a way to reduce the number of credits that will need to be bought by the University. The University will need to purchase 1.82 TN credits and 0.45 TP credits to compensate for the difference in reductions between the original bioretention BMPs and the Retrofit Infiltration BMPs. See Appendix C for calculations.
- BMP 17 Infiltration is not currently functioning as it is supposed to so it will be decommissioned and will not be replaced. BMP 17 was built before 2009, so it does not contribute any credit and thus will not be replaced.
- BMP 18 Infiltration is where the new NSU Safety Fence is going to be installed hence it will be decommissioned. BMP 18 was also built before 2009, so it does not contribute any credit and will not be replaced.

9.0 LIST OF FUTURE PROJECTS QUALIFYING AS GRANDFATHERED

NSU must list projects that qualify as grandfathered in accordance with 9VAC25-870-48. No such projects have been identified for NSU.

10.0 ESTIMATED COST OF COMPLIANCE

Table 10.0.1 provides a summary of the estimated maintenance cost for current BMPs and continued annual practices. These projects exceed the POC reduction requirements of the phase 2 permit cycle. Additional methods will need to be considered for the final phase 3 permit cycle.

Table 10.0.1 – Estimated Cost of Compliance

Strategy	Cost Explanation	Estimated Cost
Street Sweeping	Annual budgeted cost of street sweeping based on adopted capital budget.	$12,500year
Existing BMPs Project	BMP maintenance	$25,000/year

Ensuring an adequate funding source for meeting the Chesapeake Bay TMDL is a key component. The University capital maintenance fund allows for stormwater management, including Chesapeake Bay TMDL compliance. The University is seeking grants to allow for additional rehabilitation/conversion of existing BMPs for higher pollutant efficiency removal to meet future permit cycle pollutant removal goals.

11.0 PUBLIC COMMENTS

The time for the public comment process for NSU's Chesapeake Bay TMDL Action Plan is in progress. The opportunity for public comments will be announced on NSU's web page and through NSU's social media outlets. The action plan will be posted on NSU's web site.

The public may submit any comments or concerns to the following email address: ehs@nsu.edu

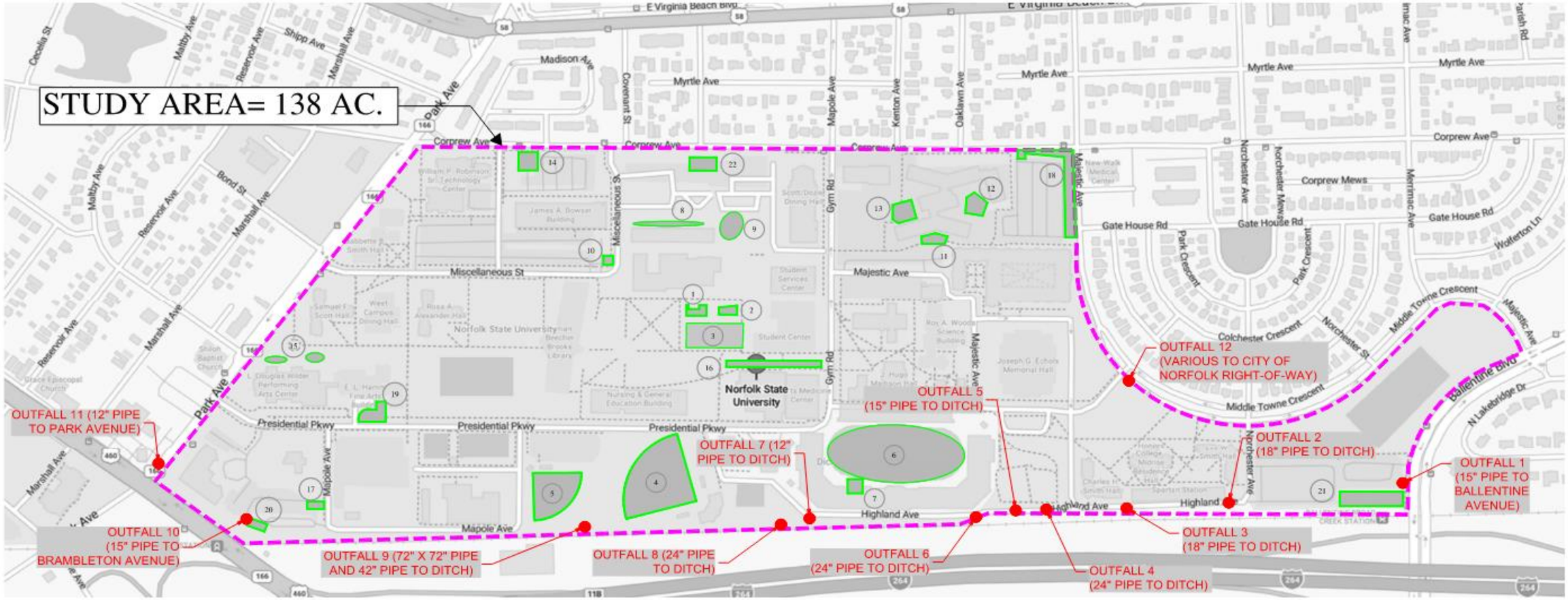
The public may also contact the University at: (757) 823-9000 or (757) 823-9142.

Public comments will be summarized in the table below and will be taken into consideration in developing the final plan.

Table 11.0.1 – Public Comments

APPENDIX A

Map 1. MS4 Outfalls and BMPs



OUTFALLS TIE TO CITY OF NORFOLK STORM NETWORK THAT DISCHARGE TO THE ELIZABETH RIVER TO THE SOUTH.

NORFOLK STATE UNIVERSITY OUTFALL AND BMP MAP

LEGEND

- LIMITS OF STUDY AREA
- EXISTING BMPs
- (X) BMP NUMBER ID

Table A1- BMP Map Legend:

BMP 1	**STUDENT CENTER/ GODWIN HALL**
BMP 2	**STUDENT CENTER**
BMP 3	**STUDENT CENTER**
BMP 4	**BASEBALL FIELD**
BMP 5	**SOFTBALL FIELD**
BMP 6	**STADIUM**
BMP 7	**STADIUM CRYSTAL STREAM**
BMP 8	**BROWN HALL NORTH**
BMP 9	**BROWN HALL SOUTH**
BMP 10	**FILTERRA**
BMP 11	**RESIDENTIAL FACILITY 1**
BMP 12	**RESIDENTIAL FACILITY 1**
BMP 13	**RESIDENTIAL FACILITY 1**
BMP 14	**GATE 3/ LOT 30**
BMP 15	**HAMM FINE ARTS NORTH**
BMP 16	**PE/ SPORTS MED**
BMP 17*	**WILSON ADMIN/ LOT 2 & 3**
BMP 18*	**SPARTAN SUITES**
BMP 19*	**HAMM FINE ARTS SOUTH**
BMP 20*	**WILSON ADMIN**
BMP 21*	**OUTFALL 1/ LOT 10**
BMP 22*	**LOT 17**

*****BMPS MARKED WITH AN ASTERIX WERE BUILT BEFORE 2009 AND DO NOT RECEIVE CREDITS

APPENDIX B

Reduction Credit Calculations for Implemented Projects in Phase 1 and Phase 2

Table B1- Reduction Credit from Phase 1 and Phase 2 Implemented BMPs Summary Chart

BMP No.	Year of BMP Installation	Type of BMP	Location of BMP	Total Nitrogen Estimated Reduction (lb./yr.)	Total Phosphorous Estimated Reduction (lb./yr.)	Total Suspended Solids Estimated Reduction (lb./yr.)
BMP 1	2010	Bioretention Level 1	Student Center/ Godwin Hall	5.19	0.62	238.10
BMP 2	2011	Underground Infiltration	Student Center	2.70	0.45	493.59
BMP 3	2012	Bioretention Level 1	Student Center	5.19	0.62	238.10
BMP 4	2017	Infiltration Level 1	Baseball Field	12.58	0.96	216.06
BMP 5	2017	Infiltration Level 1	Softball Field	3.36	0.26	57.62
BMP 6	2018	Infiltration Level 1	Stadium	19.14	3.34	966.67
BMP 7	2018	Crystal Stream Separator	Stadium	0.00	0.89	888.15
BMP 8	2018	Bioretention	Brown Hall North	7.27	0.97	384.84
BMP 9	2018	Bioretention	Brown Hall East	4.48	0.66	276.93
BMP 10	2019	Filterra Bio-Filtration	Bowser Bldg. Parking	0.00	0.15	0.00
BMP 11	2019	Micro Bioretention	Residential Facility 1	1.42	0.19	73.88
BMP 12	2019	Micro Bioretention	Residential Facility 1	0.42	0.05	19.48

BMP 13	2019	Micro Bioretention	Residential Facility 1	0.72	0.06	19.73
BMP 14	First Installed in 2005, Retrofitted in 2023	Previously Detention Basin, now Infiltration Basin	Gate 3/ Lot 30	8.64	1.61	611.53
BMP 15	First Installed in 2005, Retrofitted in 2023	Previously Vegetated Open Channel, now Grass Channel	Hamm Fine Arts N Bldg.	-0.53	-0.14	83.47
BMP 16	First Installed in 2008, Retrofitted in 2023	Previously Vegetated Open Channel, now Infiltration Basin	PE/ Sports Med Building	2.28	0.25	227.99

Table B2- Total Reduction Credits from Phase 1 and Phase 2 BMPs

	TN Removed	**TP Removed**	**TSS Removed**
Subtotal POCs Removed	72.86 lb./yr	10.93 lb./yr	5778.88 lb./yr

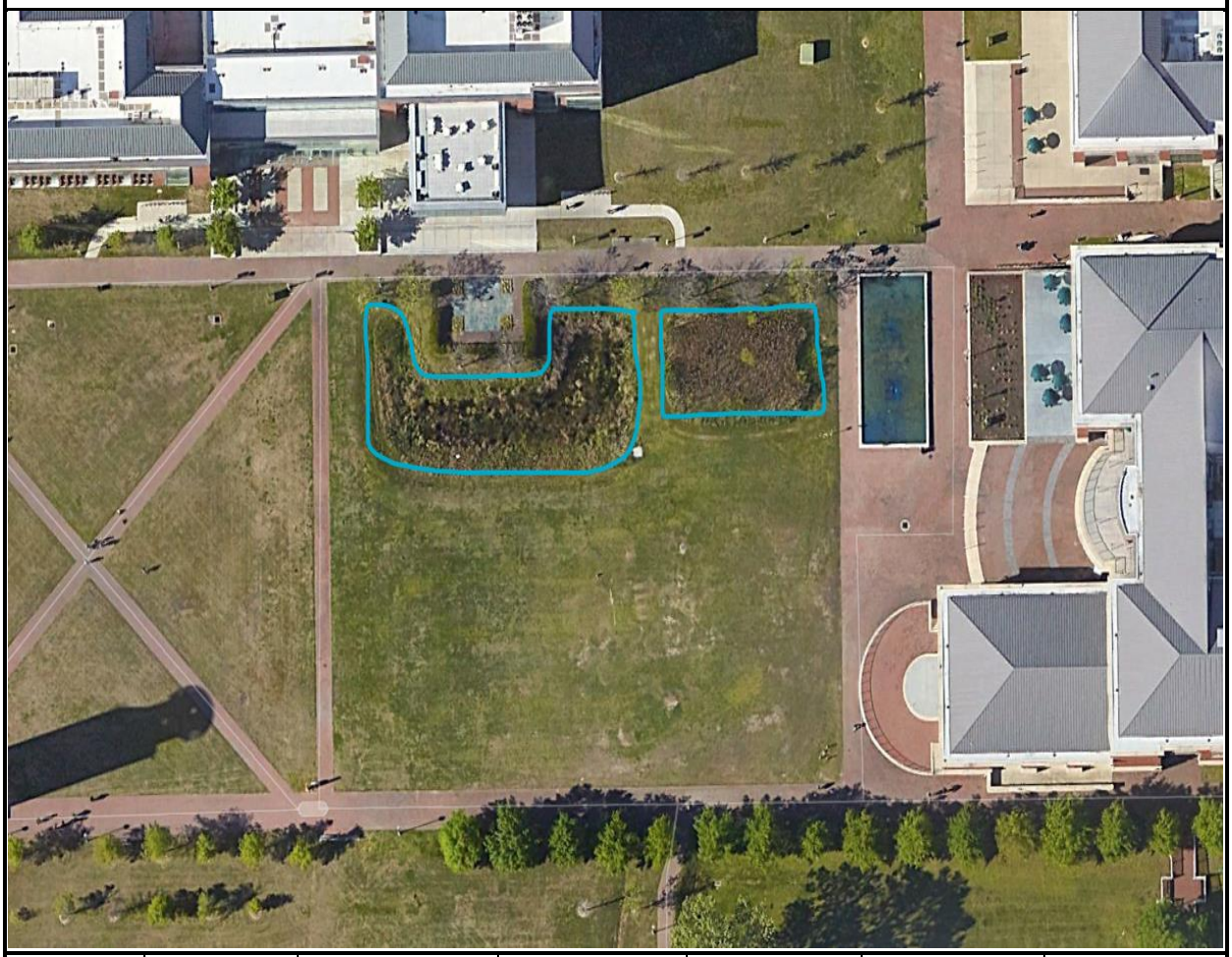
APPENDIX C

Reduction Credit Calculations for Planned Projects for Phase 3

Table C1- Retrofit Project Calculations

Project Name: BMP 1 and BMP 3 Retrofits – Level 1 Infiltration – Student Center

Project Description: BMPs 1 and 3 Retrofits from Bioretention Cells to Infiltrations



Date	Type	Imp. Acres Treated	Total Acres Treated	Runoff Captured	Unit	Amount Applied
2025	Lvl. 1 Infiltration	0.73	1.73	1658	Ft^3	1.73

Latitude	Longitude	HUC	TN Efficiency	TP Efficiency	Efficiency Unit
36.848600	-76.262540	JL54	15	25	%

TN Removed	TP Removed	Reduction Unit	Calculation Method / Efficiency Source	Estimated Cost of BMP Retrofit Construction
8.56	1.30	lbs./yr.	VRRM for Retrofit & Chesapeake Bay Program for Existing BMPs	$103,000

Table C2- Pre-Retrofit Reductions

BMP 1 & 3 Bioretention Reductions					
Pre-Retrofit BMP Reductions					
Impervious	0.73	ac.			
Pervious	1	ac.			
Nitrogen Reduction	Area				
For Impervious	0.73	9.39	lb TN/ac/yr	6.85	lbs TN/yr
For Pervious	1	6.99	lb TN/ac/yr	6.99	lbs TN/yr
Multiply by efficiency	0.75				
For Impervious	5.14	lbs TN/yr			
For Pervious	5.24	lbs TN/yr			
Total Nitrogen reduction	**10.38**	**lbs TN/yr**			
Phosphorous Reduction	Area				
For Impervious	0.73	1.76	lb TP/ac/yr	1.28	lbs TN/yr
For Pervious	1	0.5	lb TP/ac/yr	0.50	lbs TN/yr
Multiply by efficiency	0.70				
For Impervious	0.90	lbs TP/yr			
For Pervious	0.35	lbs TP/yr			
Total Phosphorous reduction	**1.25**	**lbs TP/yr**			

Table C3- VRRM Calculations

BMP 1 and BMP 3 Infiltration Reductions		
VRRM Reduction Calculations		
Impervious	0.73	ac.
Pervious	1	ac.
Nitrogen Reduction	Area	
For Impervious	0.73	
For Pervious	1	
Efficiency	0.15	
Total Nitrogen reduction	**8.56**	**lbs TN/yr**
Phosphorous Reduction	Area	
For Impervious	0	
For Pervious	8.56	
Efficiency	0.25	
Total Phosphorous reduction	**1.30**	**lbs TN/yr**

Table C4- Post Retrofit Reductions

Post- Retrofit Reductions		
Difference Between New BMP and Old BMP		
Total Nitrogen Reduction New BMP	8.56	lbs TN/yr
Total Nitrogen Reduction Old BMP	10.38	lbs TN/yr
Difference	-1.82	lbs TN/yr
Retrofit Total Nitrogen Reduction	**-1.82**	**lbs TN/yr**
Total Phosphorous Reduction New BMP	0.25	lbs TN/yr
Total Phosphorous Reduction Old BMP	0.70	lbs TN/yr
Difference	-0.45	lbs TN/yr
Retrofit Total Phosphorous Reduction	**-0.45**	**lbs TN/yr**

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell
1317 Executive Boulevard, Suite 300
Chesapeake, VA 23320
O 757-548-2056
www.burnsmcd.com