VPDES MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)
PERMIT: VAR040039

Draft Third Phase Chesapeake Bay TMDL Action Plan

WILLIAM & MARY

CHARTERED 1693

SEPTEMBER 30, 2023

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APPENDIX

1.0 INTRODUCTION

The College of William and Mary (university) was originally issued an MS4 permit in 2003 by the Commonwealth of Virginia. This permit outlines minimum requirements for the operation of the university's storm sewer system, including storm water treatment systems (BMPs), and it is reissued every five years. The College's current permit number is VAR040039, and the permit cycle duration is from November 1, 2018, to October 31, 2023. As a MS4 community, the College is required to complete a draft Chesapeake Bay TMDL Action Plan by October 1, 2023, as part of the 2023 to 2028 (3rd cycle) phase II general permit. The draft CB TMDL Action Plan will be a critical planning tool used to provide permit compliance in a fiscally responsible manner. This draft 3rd cycle Chesapeake Bay TMDL action plan is provided to meet reporting requirements per permit section II, part A12 (b). The draft will outline the College of William & Mary's (CWM) compliance path for the third permit cycle (2023-2028) of the Chesapeake Bay TMDL. This draft Chesapeake Bay TMDL action plan will be updated for reductions required in Part II A3, A4, and A5 of permit no later than 12 months after the 3rd phase permit's effective date, including changes in land cover.

2.0 LEGAL AUTHORITIES

No new or modified legal authorities, such as ordinances, permits, policy, specific contract language, orders, and interjurisdictional agreements have been implemented and no additional authorities are required at this time.

3.0 REQUIRED LOAD REDUCTIONS

The Virginia Department of Environmental Quality requires that existing MS4 communities provide Pollutant of Concern (POC) reductions based on the 2009 service area during the current permit cycle (November 1, 2023-October 31, 2028). Permit cycle reductions have been determined using expanded MS4 areas as determined by the 2010 census data. Chesapeake Bay TMDL load and cumulative reduction calculations for James River basin calculated below in accordance with Part II A3, A4, and A5.

Table 3 a: Calculation Sheet for Estimating Existing Source Loads and Reduction Requirements for the James River, Lynnhaven, and Creek Basins							
		A	**B**	**C**	**D**	**E**	**F**
Pollutant	Subsource	Loading rate (lbs/ac/yr)	Existing Developed Lands as of 6/30/09 served by the MS4 within the 2010 CUA (acres)	Load (lbs/yr)	Percentage of MS4 required Chesapeake Bay total L2 loading reduction	100% cumulative reduction required by 10/31/2028	Sum of 100% cumulative reduction (lb/yr)
Nitrogen	Regulated Urban Impervious	9.39	108.47	1019	9%	92	143
	Regulated Urban Pervious	6.99	122.61	857	6%	51	
Phosphorus	Regulated Urban Impervious	1.76	108.47	191	16%	31	35
	Regulated Urban Pervious	0.5	122.61	61	7.25%	4	

4.0 TOTAL REDUTIONS ACHIEVED AS OF NOVEMBER 1, 2023

Current cumulative reductions exceed the required phase II removal reductions. The total reductions achieved as of November 1, 2023 for each pollutant of concern (POC) in James River basin are:

Pollutant	**Cumulative Reduction (lb/yr)**
Nitrogen	477.77
Phosphorus	34.51

5.0 LIST OF BMPS IMPLEMENTED PRIOR TO NOVEMBER 1, 2023

The College has implemented the following projects since 6/30/2009 for removal compliance prior to November 1, 2023. See appendix A for complete Cumulative Reduction achieved Calculations.

Current Implement BMPS

BMP	Date Implemented	Nitrogen Removal Reduction (lb/yr)	Phosphorus Removal Reduction (lb/yr)
School of Education - Bioretention	2010	8.03	1.89
School of Business - Bioretention	2009	1.04	0.28
School of Business - Cistern	2009	2.63	0.49
Law School – BMP - Retrofit	2006	17.98	2.68
South Sunken Garden - Bioretention	2016	6.67	0.78
Crim Dell – BMP - Retrofit	2018	88.38	6.24
Heath Center – Manufactured	2017	51.99	3.59
Health Center BMP – Retrofit	2017	129.13	8.56
Wildflower Refuge – BMP - Retrofit	2017	171.92	9.99
	Total	**477.77**	**34.51**

6.0 BMPS TO BE IMPLEMETED WITHIN 60 MONTHS OF EFFECTIVE DATE OF PHASE III PERMIT (NOVEMBER 1, 2028)

The College already achieved compliance with the third cycle Nitrogen removal. The College has a phosphorus deficit of 0.49 lbs/yr. This CB Action Plan will be revised within one year of third cycle permit's effective date to consider redevelopment projects. Please note that in the third permit cycle, no TSS removal is required.

7.0 PUBLIC PARTICIPATION

The College will consider the public comments during revising and finalizing the CB TMDL Action Plan next year, this section will be updated with any public feedback that is received.

APPENDIX B – CUMULATIVE REDUCTION ACHIEVED CALCULATION

College of William & Mary
Stormwater Infrastructure Improvements

Chesapeake Bay TMDL
Cumulative Reduction Achieved Calculations as of November 1, 2023

					Direct drainage area (not including upstream)			Pollutant Load from direct drainage area		Pollutant Load from upstream		Total Pollutant Load				Removal Achieved				
Completed Projects	Type	Total Area Treated (Ac)						N (lbs)	P (lbs)	N (lbs)	P (lbs)	N (lbs)	P (lbs)	Removal Efficiences		N (lbs)	P (lbs)	Calculation Methodology	Year Constructed	Remarks
		Imp.	Perv.	Forest	Imp.	Perv.	Forest							N	P					
School of Education (SOE)	Bioretention	1.74	2.26	0	1.74	2.26	0	32.14	4.19	0.00	0.00	32.14	4.19	25	45	8.03	1.89	Ches Bay Program (Established Efficiencies)		Bioretention C/D soils, underdrain
School of Business	Bioretention	0.3	0.19	0	0.3	0.19	0	4.15	0.62	0.00	0.00	4.15	0.62	25	45	1.04	0.28	Ches Bay Program (Established Efficiencies)		Bioretention C/D soils, underdrain
School of Business	Cistern	0.56	0	0	0.56	0	0	5.26	0.99	0.00	0.00	5.26	0.99	50	50	2.63	0.49	BMP Clearinghouse		RS = 1,395 cf, IA = 0.56 Ac
Law School	Retrofit	6.48	3.53	1.86	6.48	3.53	1.86	89.91	13.41	0.00	0.00	89.91	13.41	20	20	17.98	2.68	10% per missing design element based on Ches Bay Program (Established Efficiences)		Credit for adding forebay & outlet pool to dry ED basin (20%, 20% & 60%)
South Sunken Garden	Bioretention	0.31	0.65	0.00	0.31	0.65	0.00	7.41	0.86	0.00	0.00	7.41	0.86	90	90	6.67	0.78	Type 2, BMP Clearinghouse for N&P, TSS from Ches Bay Program RR curves	2016	N & P from BMP Clearinghouse, Ches Bay Program RR TSS Curves
Crim Dell	Retrofit	6.37	11.68	3.29	6.06	11.03	3.29	141.81	16.61	0.74	0.09	142.55	16.70	62	37	88.38	6.24	Ches Bay Program ST Curves	circa 1930	Conversion for non-BMP to wet pond
Health Center Crystal Stream	Manufactured	6.97	4.18	0.00	6.97	4.18	0.00	94.67	14.36	0.00	0.00	94.67	14.36	55	25	51.99	3.59	N & TSS: Bay Program ST curves, P: BMP Clearinghouse	2016	RD = 1"
Health Center BMP	Retrofit	9.96	20.06	8.83	9.96	20.06	8.83	254.58	28.71	42.68	10.77	297.26	39.48	43	22	129.13	8.56	Ches Bay Program ST Curves - dry detention missing two elements	2005	Conversion from non-compliant dry detention to wet pond
Wildflower Refuge BMP	Retrofit	33.58	52.17	19.35	23.62	32.11	10.52	471.07	58.99	222.30	41.37	693.37	100.37	25	10	171.92	9.99	Ches Bay Program ST Curves - dry detention missing two elements	2005 2016	Conversion from non-compliant dry detention to wet pond RD = 1"
TOTALS																477.77	34.51			