

### MCB QUANTICO STORMWATER MS4 SUPPORT CHESAPEAKE BAY TMDL ACTION PLAN

STORMWATER MS4 PROGRAM SUPPORT

MCB QUANTICO FY19 CWA SUPPORT NAVFAC Contract Number: N62470-14-D-9016 Delivery/ Task Order Number: N4008019F4606

MARINE CORPS INSTALLATIONS NATIONAL CAPITAL REGION MARINE CORPS BASE QUANTICO (MCINCR-MCBQ) VIRGINIA

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Prepared for

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#### LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice				
CBAP	Chesapeake Bay Action Plan				
CBP	Chesapeake Bay Program				
CY	Calendar Year				
DEA	Drug Enforcement Administration				
DMR	Discharge Monitoring Report				
DoD	Department of Defense				
DOJ	Department of Justice				
DON	Department of the Navy				
E&SC	Erosion and Sediment Control				
EISA	Energy Independence and Security Act				
EOS	Edge of Stream				
FBI	Federal Bureau of Investigation				
FY	Fiscal Year				
GIS	Geographic Information Systems				
kg	Kilogram				
lbs.	pounds				
LID	Low Impact Development				
MCINCR-MCBQ	Marine Corps Installations National Capital Region – Marine Corps Base Quantico				
MCM	Minimum Control Measure				
MEP	Maximum Extent Practicable				
mg/L	milligrams per liter				
MS4	Municipal Separate Storm Sewer System				
MSG	Marine Security Guard				
NMP	Nutrient Management Plan				
NREA	Natural Resources and Environmental Affairs				
POC	Pollutant(s) of Concern				
TMDL	Total Maximum Daily Load				
TN	Total Nitrogen				
TP	Total Phosphorus				
TSS	Total Suspended Solids				

UFC	United Facilities Criteria
U.S.	United States
USMC	United State Marine Corps
VA	Virginia
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VPDES	Virginia Pollutant Discharge Elimination System
WIP	Watershed Implementation Plan
WWTP	Wastewater Treatment Plant
yr.	year

#### **EXECUTIVE SUMMARY**

Marine Corps Installations National Capital Region Marine Corps Base Quantico (MCINCR-MCBQ) is authorized to discharge under the Virginia General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) (Permit No. VAR040069), hereinafter referred to as "MS4 Permit". In accordance with Section I.B of the MS4 Permit, MCINCR-MCBQ is required to develop a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan (CBAP).

This document provides the CBAP for MCINCR-MCBQ and meets the CBAP requirements in the MS4 Permit. This document also meets the requirements contained within the Virginia Department of Environmental Quality (VDEQ) Water Division Guidance Memo No. 20-2003, dated 06 February 2021 (2021 VDEQ Guidance Memo), which provides guidance on procedures to meet the Chesapeake Bay TMDL Special Condition requirements in the 2018-2023 MS4 Permit. This CBAP is valid for the second permit cycle (01 November 2018 through 30 October 2023).

Based on the evaluation completed and documented in this Plan, MCINCR-MCBQ has already exceeded its pollutant reduction requirement for total suspended solids (TSS) through the implementation of existing best management practices (BMPs), and no additional TSS reduction is required for this permit cycle. **Table ES-1** summarizes the remaining reductions required for total nitrogen (TN) and total phosphorus (TP), which the installation intends to meet through nutrient trading with MCINCR-MCBQ's Mainside Wastewater Treatment Plant (WWTP).

Variable	Load Reductions for Existing Sources (lbs/yr)			
	TN	TP	TSS	
Total Reductions Required for this Permit Cycle	367.26	38.99	31,534.85	
Total Allowable Existing Source Reductions from Existing BMPs	286.22	27.48	53,065.40	
Remaining Reductions Needed for this Permit Cycle (2018-2023)	81.04	11.51	0	
Total Allowable Existing Source Reductions from Nutrient and Sediment Trading	10,624.00	1,086.00	39,334.00	
Surplus Reductions to Apply Toward next Permit Cycle (2023-2028)	10,542.96	1,074.49	60,874.55	

 Table ES-1. Progress Toward MCINCR-MCBQ's Require Reductions

 for this Permit Cycle

MCINCR-MCBQ should implement a nutrient trading agreement with the Mainside WWTP, issuing 81.04 lbs/yr of TN and 11.51 lbs/yr of TP to the MCINCR-MCBQ MS4. This agreement should go into effect no later than 30 June 2023 and include a completed MS4 Nutrient Credit Acquisition Form, available from VDEQ. After the CBAP is submitted to the VDEQ, unless specifically denied in writing by the VDEQ, this Plan becomes effective and enforceable 90 days after the date received.

#### **1.0 INTRODUCTION**

The Virginia Administrative Code (VAC) under 9VAC25-890 and Permit Number VAR040069 provide the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), hereinafter referred to as "MS4 Permit". Operators of Small MS4s in urbanized areas as defined by the decennial Census, such as Marine Corps Base Quantico (MCINCR-MCBQ), are subject to the requirements of this MS4 Permit. MCINCR-MCBQ's location within the Chesapeake Bay Watershed and Section I.C of the MS4 Permit require MCINCR-MCBQ to develop a Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan (CBAP).

This document provides the CBAP for MCINCR-MCBQ and meets the CBAP requirements in the MS4 Permit. This document also meets the requirements contained within the Virginia Department of Environmental Quality (VDEQ) Water Division Guidance Memo No. 20-2003, dated 06 February 2021 (2021 VDEQ Guidance Memo), which provides guidance on procedures to meet the Chesapeake Bay TMDL Special Condition requirements in the 2018-2023 MS4 Permit. This CBAP is valid for the second permit cycle (01 November 2018 through 30 October 2023).

This Plan documents the means and methods that MCINCR-MCBQ will use to meet the 40% pollutant reduction requirements (additional 35% from 2013 CBAP). After the CBAP is submitted to the VDEQ by MCINCR-MCBQ, unless specifically denied in writing by the VDEQ, this Plan becomes effective and enforceable 90 days after the date received by the VDEQ.

The organization and content of this document are consistent with the 2021 VDEQ Guidance Memo and include:

Section	Description						
2	Any new or modified legal authorities, such as ordinances, permits, policy, contract						
	language, orders, and inter-jurisdictional agreements, implemented or needing to be						
	implemented to meet the requirements of MS4 Permit Part II A 3, A 4, and A 5.						
3	The load and cumulative reduction calculations for calculated in accordance with						
	MS4 Permit Part II A 3, A 4, and A 5.						
4	The total reductions achieved as of 30 June 2020, for each pollutant of concern.						
5	A list of BMPs implemented prior to 30 June 2020, to achieve reductions associated						
	with the Chesapeake Bay TMDL.						
6	The best management practices (BMPs) to be implemented by MCINCR-MCBQ						
	prior to the expiration of this permit to meet the cumulative reductions calculated in						
	MS4 Permit Part II A 3, A 4, and A 5.						
7	A summary of any comments received as a result of public participation required in						
	MS4 Permit Part II A 12, MCINCR-MCBQ's response, identification of any public						
	meetings to address public concerns, and any revisions made to Chesapeake Bay						
	TMDL Action Plan as a result of public participation.						
8	Miscellaneous information (i.e., submission, implementation, and Annual						
	Reporting).						
9	A list of references.						

#### 2.0 CURRENT PROGRAM AND EXISTING LEGAL AUTHORITIES

This section provides a review of MCINCR-MCBQ's current MS4 Program and the legal authorities that MCINCR-MCINCR-MCBQ uses to ensure compliance with Part II A 3, A 4, and A 5 of the MS4 Permit. This section also provides a summary of the other regulations and policies that require MCINCR-MCBQ to reduce pollutants in stormwater runoff, thereby facilitating compliance with the CBAP.

#### 2.1 MS4 Program

MCINCR-MCBQ's MS4 Program Plan details its program to be implemented under the MS4 Permit to reduce pollutants in the stormwater discharged from the MS4. The MS4 Program Plan includes discussion of how MCINCR-MCBQ plans to meet each of the six Minimum Control Measures (MCMs) identified in the MS4 Permit.

According to Section I.B of the MS4 Permit, the implementation of the following MS4 Program components represents implementation of the CBAP to the maximum extent practicable (MEP) and demonstrates adequate progress.

- Implementation of Nutrient Management Plans (NMP) in accordance with the Permit related to pollution prevention/good housekeeping for municipal operations. NMPs for the golf course and Lincoln Housing Area have been completed; however, they do not provided credits toward 2023 pollutant reductions.
- Implementation of the MCM in MS4 Permit Section I related to construction site stormwater runoff to address discharges from Transitional Sources. MCINCR-MCBQ's plans for complying with this MCM are addressed in more detail in Section 7.0 of the MS4 Program Plan.
- Implementation of the means and methods to address discharges from New Sources in accordance with the MCM in MS4 Permit Section I related to post-construction stormwater management in new development and development of prior developed lands. MCINCR-MCBQ's plans for complying with this MCM are addressed in more detail in Section 3.0 of this CBAP.
- Implementation of the means and methods sufficient to meet the required reductions of pollutants of concern (POC) loads from Existing Sources in accordance with the CBAP are further addressed in Section 4.0 of this Plan.

#### 2.2 Existing Legal Authorities

MCINCR-MCBQ has the appropriate legal authorities and ability to ensure compliance with MS4 Permit Section I.B. MCINCR-MCBQ is a United States Marine Corps (USMC) installation and has direct legal authority over use and condition of the land and infrastructure it owns and operates within its legal boundaries, except for the following areas where the USMC does not have stormwater compliance responsibilities. Therefore, certain excepted land and infrastructure is not covered by this CBAP.

- The historic Town of Quantico, located within the MCINCR-MCBQ fence line, is neither owned nor operated by MCINCR-MCBQ.
- Parcels leased to and operated by the Department of Justice (DOJ) for use by the Federal Bureau of Investigation (FBI) and the Drug Enforcement Administration (DEA). These parcels have separate coverage under the MS4 Permit; therefore, stormwater activities are managed and permitted independent of MCINCR-MCBQ.

MCINCR-MCBQ is responsible for managing stormwater and the MS4 system on its property. MCINCR-MCBQ understands that it is responsible, through its contractors, to obtain the appropriate Construction General Permits and follow the prescribed requirements as they pertain to construction projects. MCINCR-MCBQ is required to comply with the Construction General Permit for construction projects disturbing 2,500 square feet or greater as described in Section 7.0 of the MS4 Program Plan.

Lastly, enforcement language is included in contract documents which require the contractor to take immediate corrective action in the event of noncompliance during land disturbing activities. In addition, MCINCR-MCBQ requires the contractor to ensure its employees are aware of how these requirements affect the work performed under the contract.

#### **Other Pertinent Regulations and Policies**

MCINCR-MCBQ ensures compliance with the following regulations and policies for all projects on the installation.

- The Department of Defense (DoD) has published a United Facilities Criteria (UFC) entitled "Design: Low Impact Development" (UFC 3-210-10, 01 July 2015, revised 01 March 2020). The DoD requires all facilities development projects use the UFC. The incorporation of Low Impact Development (LID) into the general construction requirements provides for increased stormwater management of both quantity and quality, thus protecting rivers, streams and water bodies of the country.
- On 16 November 2007, the Department of the Navy's (DON) policy for Storm Water Management, or LID policy letter, was issued. It sets a goal that major renovation and construction projects are to have no net increase in stormwater volume and sediment or nutrient loading, and to reduce reliance on traditional stormwater treatment options and collection systems. Major construction is defined by DON as any project exceeding \$750,000.00. To meet this goal, the

policy letter instructs the Navy and Marine Corps to incorporate LID practices in all major renovation and construction projects starting in fiscal year (FY) 2011.

• On 19 December 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law. A provision located in Title IV ("Energy Savings in Building and Industry"), Subtitle C "(High Performance Federal Buildings") requires projects involving a federal facility with a footprint that exceeds 5,000 square feet to "use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

#### 2.3 New or Modified Legal Authorities

According to the MS4 Permit Section II.A.11.a, MCINCR-MCBQ must identify 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 MS4 Permit Section I.B It has been determined that no new legal authorities are required for permit compliance.

#### 3.0 LOAD AND CUMULATIVE REDUCTION CALCULATIONS

#### 3.1 Regulated MS4 Boundary

The MCINCR-MCBQ regulated MS4 boundary is defined as the areas of the installation defined as urbanized areas in the 2010 United States Census. Based on geospatial analysis, the urbanized area that intersects with the MCINCR-MCBQ property boundary includes only portions of MCINCR-MCBQ's Mainside parcel. The lands within this urbanized area are considered regulated by VDEQ. **Figure 1** depicts the MS4 boundary at MCINCR-MCBQ.

The following areas of MCINCR-MCBQ are excluded from the MCINCR-MCBQ's regulated MS4 area:

- Lands regulated under an individual VPDES permit for industrial stormwater discharges: MCINCR-MCBQ holds individual VPDES permit number VA0002151 for industrial stormwater discharges, which expires on 31 January 2023. The areas that discharge to regulated outfalls listed in permit VA0002151, which are sampled regularly for permit compliance, were excluded from MCINCR-MCBQ's regulated MS4.
- Forested Lands, Wetlands, and Open Waters: For completeness, these areas on MCINCR-MCBQ were included within the boundary of the regulated MS4; however, their acreages were excluded from the regulated MS4 total acreage calculation as permitted per the 2021 VDEQ Guidance Memo and detailed further in Section 5.0 of this Plan.

**Figure 2** depicts the MS4 boundary and identifies the industrial permitted areas excluded from the regulated MS4 acreage.



Figure 1. Overlap of MCINCR-MCBQ Property and 2010 United States Census Urbanized Area



Figure 2. MCINCR-MCBQ's Regulated MS4 Boundary and Exclusion

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#### **3.2** Calculation of Existing Source Loads

MS4 Permit Section II.A.1 requires an estimate of the annual POC loads discharged from the Existing Sources as of 30 June 2009, based on the 2009 Level 2 (L2) Progress Run. Using MCINCR-MCBQ's Geographic Information Systems (GIS) data and available aerial photography from June 2009, the land uses within MCINCR-MCBQ's regulated MS4 boundary were analyzed and quantified. As discussed in Section 3.1, the lands regulated under MCINCR-MCBQ's individual Virginia Pollution Discharge Elimination System (VPDES) permit for industrial stormwater discharges were excluded from this land use evaluation. **Table 1** summarizes the existing source acreage for the MCINCR-MCBQ MS4. Acres of forest, water, and wetlands have been included for reference; however, they do not affect the total source load calculation.

Land Use	Acreage	Urban Categorization	Total Acreage	
Building	72			
Pavement	232	<b>Regulated Impervious</b>	324	
Gravel	20	Urban		
Dirt	30	Deculated Devices Unber		
Grass	893	Regulated Pervious Urban	923	
Forest	2,390			
Water	166	Non-Urban Lands	2,642	
Wetlands	86			
Total	3,889		3,889	

Table 1. 30 June 2009 Land Use Acreage Comprising Existing Sources at MCINCR-MCBQ

Note: The non-urban lands (forest, wetlands, and water) are not included for purposes of calculating Existing Source loads as well as land that is regulated by MCINCR-MCBQ's Individual industrial stormwater permits.

In accordance with MS4 Permit Section II.A.1 and due to MCINCR-MCBQ's location within the Potomac River Basin, the regulated impervious urban and regulated pervious urban acres and estimated total POC loads are shown in **Table 2**. The 2009 Edge of Stream (EOS) loading rates were provided in the Table 3b Calculation Sheet from MS4 Permit Section II.A.1 and are used to calculate the estimate baseline total POC load for MCINCR-MCBQ.

Subsource	Pollutant	Total Existing Acres Served by MCINCR- MCBQ (06/30/09)	2009 EOS Loading Rate (lbs./acre/yr)	Estimated Baseline Total POC Load for MCINCR- MCBQ Based on 2009 Progress Run (lbs./yr)			
Regulated Urban Impervious	Nitrogon	324	16.86	5,463			
Regulated Urban Pervious	nirogen	923	10.07	9,295			
	·		Nitrogen Total:	14,758			
Regulated Urban Impervious	Dhoonhomus	324	1.62	525			
Regulated Urban Pervious	Filosphorus	923	0.41	378			
Phosphorus Total: 903							
Regulated Urban Impervious	Total	324	1,171.32	379,508			
Regulated Urban Pervious	Suspended Solids	923	175.80	162,263			
		Total Suspende	ed Solids Total:	541,771			

## Table 2. Calculation of Estimated Existing Source Loads for MCINCR-MCBQ(2009 Baseline)

MCINCR-MCBQ is required to plan to meet 40% of the L2 scoping run reductions for existing sources by the end of the second MS4 Permit cycle (June 30, 2023). **Table 3** provides the calculation sheet to determine the 40% load reduction required during the second permit cycle.

Subsource	Pollutant	Total Existing Acres Served by MCINCR- MCBQ (06/30/2009)	2009 EOS Loading Rate (lbs./acre/yr)	Estimated Total POC Load for MCINCR- MCBQ/ Based on 2009 Progress Run (lbs./yr)	Percentage of MS4 Required Chesapeake Bay Total L2 Load Reduction	Percentage of L2 Required Reduction by 06/30/2023	40% Cumulative Reduction Required by 06/30/2023 (lbs./yr)	Sum of 40% Cumulative Reduction (lbs./yr)
Regulated Urban Impervious	Nitrogen	324	16.86	5,463	9%	40%	196.55	<i>A</i> 10 72
Regulated Urban Pervious	Nillogen	923	10.07	9,295	6%	40%	223.07	417.72
		Nitrogen Tota	ıl:	14,758				
Regulated Urban Impervious	Dhaanharua	324	1.62	525	16%	40%	33.59	11 56
Regulated Urban Pervious	923	0.41	378	25%	40%	10.97	44.30	
		Phosphorus T	'otal:	903				
Regulated Urban Impervious	Total Suspended	324	1,171.32	379,508	20%	40%	30,360.61	36 030 83
Regulated Urban Pervious	Solids	923	175.80	162,263	8.75%	40%	5,679.22	30,037.03
	<b>Total Su</b>	spended Solids	Total:	541,771				

# Table 3. Calculation of Required Reductions for MCINCR-MCBQ<br/>(Permit Cycle 2018-2023)

Sections 4.0 and 5.0 of this Plan discuss the means and methods available for implementation in order to meet the required reductions identified in **Table 3**.

#### 3.3 Means and Methods to Address Discharges from New Sources

MS4 Permit Section II.A.4 requires a discussion on the means and methods that will be utilized to address discharges into the MS4 from New Sources. New Sources subject to Section II.A.4 include only construction initiated on or after 01 July 2009 that either disturbed one acre or less, or disturbed greater than one acre but has a land use condition of 16% or less impervious cover used in design of post-development stormwater management facilities. The following means and methods are used by MCINCR-MCBQ to address discharges from these New Sources.

- For all construction projects disturbing greater than one acre, MCINCR-MCBQ adheres to the Virginia Stormwater Management Program regulations for the implementation of post-development stormwater management facilities. This includes acquiring the required General Construction Permit for projects disturbing greater than one acre, which must be designed to meet the phosphorus load that is equivalent to a land cover condition of 16% imperviousness; therefore, these projects would meet MS4 Permit Section I.C and not require additional offsets.
- In addition, MCINCR-MCBQ requires that all construction sites greater than or equal to 2,500 square feet and less than one acre must have an Erosion and Sediment Control (E&SC) Plan approved by MCINCR-MCBQ's Natural Resources and Environmental Affairs (NREA) Branch.
- MCINCR-MCBQ has a program where they proactively demolish unused buildings and pavement and return them to grass. The activities under this program serve to offset any New Sources resulting from construction projects initiated on or after 01 July 2009 that disturb one acre or less. These offsets and other reduction credits are quantified in Section 5.0 of this Plan.

#### 3.3.1 Construction Initiated 01 July 2009 through 30 June 2019

MS4 Permit Section II.A.4 requires the CBAP to include the means and methods to offset increased loads from New Sources. This section provides a discussion of MCINCR-MCBQ's compliance status with this requirement.

MCINCR-MCBQ has not adopted an average land cover condition of greater than 16 % impervious cover under the Chesapeake Bay Preservation Act. MCINCR-MCBQ obtained and complied with the appropriate Construction General Permits for all New Sources initiating construction between 01 July 2009 and 30 June 2019 that disturb one acre or greater. The post-development stormwater runoff quality requirements for the Construction General Permits ensure that these New Sources are treated by stormwater BMPs to achieve equivalent 16% impervious cover baseline loads for New Sources (0.45 lb. TP/acre/yr), and therefore, no additional offsets are required under the CBAP.

**Appendix A** provides a list of BMPs treating New Sources that have been constructed or are under construction at MCINCR-MCBQ since 01 July 2009, which fall under Permit

Requirement 3 and obtained coverage under the appropriate Construction General Permits.

In addition, the following is a list of MCINCR-MCBQ construction projects and year of construction initiation. The following projects fall under Permit Requirement 3 and do not require additional offsets as a result.

- New Middle/High School, March 2018
- Additional Fuller Road Widening, 2019

### **3.4** Means and Methods to Offset Increased Loads from Grandfathered Projects that Began Construction after 01 July 2014

MS4 Permit Section II.A.5 requires a list of projects and associated acreages that qualify as grandfathered in accordance with 9VAC25-870-48. MCINCR-MCBQ projects funded prior to July 1, 2012 have received stormwater permit coverage prior to July 1, 2014. Consequently, MCINCR-MCBQ has no construction projects that meet the criteria of grandfathered projects.

#### 4.0 TOTAL REDUCTIONS ACHIEVED FOR EACH POLLUTANT OF CONCERN

Permittees are required to describe the means and methods that will be implemented to meet the POC reductions consistent with a 40% reduction of the existing source loads, and provide a schedule to achieve these reductions, including annual benchmarks to demonstrate ongoing progress. However, as described in Part IV of the 2021 VDEQ Guidance Memo, to receive credit under the CBAP for BMPs installed on or after 01 January 2006 and prior to 01 July 2009 (historical BMPs), the historical data must have been submitted using the spreadsheet provided on VDEQ's MS4 website by 01 September 2015, so that these data can be included in the Phase 6 Chesapeake Bay Model. Through a collaborative effort with the USMC Headquarters, MCINCR-MCBQ has submitted this information for future modeling efforts. However, MCINCR-MCBQ did not receive approval from VDEQ to apply credit from historical BMPs toward its CBAP reduction requirements. Consequently, MCINCR-MCBQ can only claim credit for BMPs installed on or after 01 July 2009.

Based on the 2021 VDEQ Guidance Memo and additional discussions with VDEQ, the following MCINCR-MCBQ BMPs can provide reduction credits to Existing Sources:

- Existing BMPs installed on or after 01 July 2009 that treat only Existing Sources may have 100% of their reduction credits applied.
- Existing BMPs installed on or after 01 July 2009 that treat unregulated land, baseline reductions must first be determined for unregulated land, and then excess credits can be applied to the CBAP required reductions.
- Existing BMPs installed on or after 01 July 2009 that treat New Sources may have excess reductions applied to Existing Sources.

**Table 4** summarizes the pollutant reductions from eligible existing BMPs, which are further discussed in Section 5.0 of this Plan.

Table 4. Progress Towar	d MCINCR-MCBQ's	Required Reductions	for this Permit Cycle
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Variable	Load Reductions for Existing Sources (lbs/yr)		
	TN	ТР	TSS
Total Reductions Required for this Permit Cycle	367.26	38.99	31,534.85
Total Allowable Existing Source Reductions from Existing BMPs	286.22	27.48	53,065.40
Remaining Reductions Needed for this Permit Cycle (2018-2023)	81.04	11.51	0

## 5.0 LIST OF BMPS IMPLEMENTED TO ACHIEVE REDUCTIONS FOR THE CHESAPEAKE BAY TMDL

An inventory of the existing BMPs at MCINCR-MCBQ is provided in **Appendix A** and **Appendix B** of this plan. Part IV of the 2021 VDEQ Guidance Memo specifies the type of information permittees should report for all BMPs implemented to meet the CBAP requirements, which is included for each of the BMPs in the appendices. One data point included in the BMP inventories is the number of acres treated by the BMPs for Existing Sources only (land uses existing as of 30 June 2009). If the BMP treats only New Sources, then they are not eligible for credit and are given zero credit in the inventories. If the BMP treats both Existing and New Sources (construction initiated after 01 July 2009), then only the acreage of the Existing Sources treated are provided in the appendices.

The appendices are organized by BMP installation dates that reflect whether the BMP may be eligible to receive CBAP credit, as listed below.

- Appendix A includes BMPs installed on 01 July 2009 and later: Some of the BMPs are eligible for full or partial CBAP credit only if they provide treatment for Existing Sources. A number of these BMPs treat only New Sources and are therefore not eligible for credit, which is detailed in the appendix. Many of these BMPs treat both Existing and New Sources and are therefore, eligible for partial credit, which is calculated in the appendix.
- Appendix B includes BMPs installed 1985 through 30 June 2009: These 60 BMPs are not currently eligible for CBAP credit; therefore, they provide zero credits for inclusion into the CBAP.

Each existing BMP at MCINCR-MCBQ must be assigned reduction efficiencies to be applied to the stormwater runoff from the impervious urban, pervious, and forest acreage draining to the respective BMP in order to determine the TN, TP and TSS pollutant reductions. VDEQ requires definitions of forest acreage to be consistent with Virginia Department of Forestry guidance, which is based on tree size and density and to meet the Bay Program's minimum size requirement of 30m x 30m contiguous. MCINCR-MCBQ confirmed that they use similar density requirements when defining their forest acreage.

The efficiencies assigned to a BMP depend on the type of design data available for that BMP. Construction plans and drawings were not available for many of the BMPs evaluated for this CBAP; therefore, this CBAP utilizes the most conservative reduction efficiencies from the established Chesapeake Bay Program (CBP) BMP reduction efficiencies, unless when plans were available. TN and TP efficiencies are from the Virginia Stormwater Clearinghouse (Table V.A.1), and TSS efficiencies are from Chesapeake Bay Program Established Efficiencies (Table V.C.1) of the 2021 VDEQ Guidance Memo. For Manufactured Treatment Devices, TN and TSS are from the retrofit equations from Table V.B.2 and TP is from the Virginia Stormwater Clearinghouse (Table V.A.1) of the 2021 VDEQ Guidance Memo. For the purpose of these retrofit equations, due to construction plans and drawings not being available, a value of "1 inch" is assumed for the runoff depth treated.

MCINCR-MCBQ recently developed a NMP to address the MCINCR-MCBQ Golf Course and select lawn areas. It is understood that the NMP for the golf course (or on regulated lands) will not be eligible for credit under the CBAP, but NMPs on unregulated lands may be eligible for credit. If NMPs are developed for unregulated lands, then MCINCR-MCBQ will include that information in the Annual Report.

Part III of the 2021 VDEQ Guidance Memo specifies methods to estimate POC reductions that will be credited for various BMPs. These methods were used to calculate reduction credits and are quantified in the appendices. The appendices also include important data for calculating pollutant reductions, such as the:

- Applicable EOS loading rates for TN, TP, and TSS for impervious urban, pervious urban, and forest land uses at MCINCR-MCBQ;
- EOS loads that the land uses treated by the BMP generate based on the treatment areas;
- Virginia BMP Clearinghouse and Chesapeake Bay Program Plan Reduction efficiencies for each BMP; and
- Calculated reductions applied to Existing Sources by land use for each of MCINCR-MCBQ's existing BMPs.

The BMP reduction credits were calculated for treatment of Existing Sources, in the form of load reductions from BMPs, for all existing structural BMPs at MCINCR-MCBQ. In order to do so, the treatment areas determined for Existing Sources were used. For urban land uses treated by the BMPs, the worksheets indicate whether the urban lands treated are regulated or unregulated impervious urban or pervious urban. In addition, forest lands that drain to BMPs are indicated. As previously described, regulated urban impervious land, regulated urban pervious land, and forest land are eligible for full reduction credit, although forest land use must utilize the correct loading rate for forest land. Unregulated urban impervious land and unregulated urban pervious land treated by the BMP is eligible for partial credit for reductions in excess of that required to meet baseline reductions that are equivalent to 16% impervious cover.

## 6.0 STRATEGY IMPLEMENTED BY THE PERMITTEE PRIOR TO THE EXPIRATION OF THIS PERMIT TO MEET CUMULATIVE REQUIREMENTS

MCINCR-MCBQ intends to enter into a no-cost trading agreement with the Mainside Wastewater Treatment Plant (WWTP) in order to acquire any additional TN, TP, and TSS credits to meet its reduction requirements by 30 June 2023.

#### 6.1 Nutrient and Sediment Trading Agreement

MCINCR-MCBQ operates the Mainside WWTP and participates in the Virginia Nutrient Trading Program. The VPDES permit for the WWTP includes effluent limits for total nitrogen TN, TP, and TSS; however, the monitored end-of-year, cumulative TN, TP, and TSS loads in the discharged effluent is well below the annual permit limits. Every year, the WWTP discharges TN, TP, and TSS loads that are significantly less than the VPDES permit allocations. The difference between the permitted effluent TN, TP, and TSS limits and actual effluent quality discharged are, therefore, eligible credits for MCINCR-MCBQ to apply to its CBAP. MCINCR-MCBQ's eligible TN, TP, and TSS credits are summarized in **Table 5**.

### Table 5. Total Nitrogen, Total Phosphorus, and Total Suspended Solids Credits Availableto MCINCR-MCBQ from Trading with Mainside WWTP in CY 2019

	TN	ТР	TSS			
Variable	(lbs/yr)	(lbs/yr)	(lbs/yr)			
VPDES Annual Permit Limit for Mainside WWTP <sup>1</sup>	$20,104^2$	$1,206^3$	40,2344			
Total Loads Discharged from Mainside WWTP in	9,480	120	900			
2019 <sup>5</sup>						
Credits Available	10,624	1,086	39,334			
Notes:						
<sup>1</sup> Discharge permit limits identified in Quantico Mainside Sewage Treatment Plant VPDES						
Permit No. VA0028363, effective 1 November 2019 to 31 October 2024.						
<sup>2.</sup> TN permit limit is calculated from the Mainside WWTP Permit using the 3.0 mg/L monthly						
average discharge limitation for Total Nitrogen – Calendar Year for a 2.2 MGD facility.						
<sup>3.</sup> TP permit limit calculated from the Mainside WWTP Permit using the 3.3 lb/day monthly						
average discharge limitation for Total Phosphorus.						
<sup>4.</sup> TSS permit limit calculation from the Mainside WWTP Permit using the 50 kg/day monthly						
average discharge limitation for TSS.						

<sup>5.</sup> Summary of total loads discharged from Mainside WWTP in 2019 provided by the MCINCR-MCBQ points of contact at the Mainside WWTP based on discharge monitoring reports (DMRs).

Based on the evaluation completed and documented in this Plan, MCINCR-MCBQ has already exceeded its pollutant reduction requirement for TSS through the implementation of existing BMPs, and no additional TSS reduction is required for this permit cycle. **Table 6** summarizes the remaining reductions required for TN and TP, which the installation intends to meet through nutrient trading with MCINCR-MCBQ's Mainside WWTP.

#### Table 6. WWTP Nutrient Trading Applied to MCINCR-MCBQ's Required Reductions for this Permit Cycle

Variable	Load Reductions for Existing Sources (lbs/yr)			
	TN	ТР	TSS	
Total Reductions Required for this Permit Cycle	367.26	38.99	31,534.85	
Total Allowable Existing Source Reductions from Existing BMPs	286.22	27.48	53,065.40	
Remaining Reductions Needed for this Permit Cycle (2018-2023)	81.04	11.51	0	
Total Allowable Existing Source Reductions from Nutrient and Sediment Trading	10,624.00	1,086.00	39,334.00	
Surplus Reductions to Apply Toward next Permit Cycle (2023-2028)	10,542.96	1,074.49	60,874.55	

MCINCR-MCBQ intends to implement a nutrient trading agreement with the Mainside WWTP, issuing 81.04 lbs/yr of TN and 11.51 lbs/yr of TP to the MCINCR-MCBQ MS4. This agreement will go into effect no later than 30 June 2023 and include a completed MS4 Nutrient Credit Acquisition Form, most recent version available from VDEQ.

Once MCINCR-MCBQ acquires nutrient trading credits, the installation should include a statement in that year's MS4 Annual Report to VDEQ indicating that credits were acquired.

#### 6.2 Implementation Schedule

The BMPs listed in **Appendix A** and **Appendix B** are already in place at MCINCR-MCBQ and treating Existing Sources. As discussed in Section 6.1, the nutrient trading agreement with the Mainside WWTP will go into effect no later than 30 June 2023.

The MCINCR-MCBQ MS4 and the Mainside WWTP have entered into discussions and concluded that there will be no cost to MCINCR-MCBQ associated with the nutrient trades, since these trades are occurring within the installation boundaries.

#### 7.0 PUBLIC COMMENTS ON DRAFT CHESAPEAKE BAY TMDL ACTION PLAN

In accordance with MS4 Permit requirements, MCINCR-MCBQ must provide an opportunity for receipt and consideration of public comment on the CBAP. The "public" for MCINCR-MCBQ is defined as the employee and resident population. MCINCR-MCBQ will solicit feedback from the public on its CBAP. Feedback mechanisms may consist of feedback from employees via email to the appropriate MCINCR-MCBQ staff and from residents via a feedback form on the website and/or comments via social media. The opportunity to provide comments was open for at least 15 days.

MCINCR-MCBQ did not receive any comments from the public and therefore, no responses were necessary.

#### 8.0 DISCUSSION AND RECOMMENDATIONS

This section is not specifically required to be submitted as part of the CBAP according to the 2021 VDEQ Guidance Memo, but instead provides useful information regarding implementation of the CBAP, Annual Report development, and reapplication requirements for the next permit cycle.

#### 8.1 Chesapeake Bay TMDL Action Plan Implementation

Section I.B of the MS4 Permit describes implementation of the CBAP and requires implementation to be consistent with the schedule provided in the CBAP. Compliance with this requirement will represent adequate progress for this permit cycle towards achieving the TMDL wasteload allocations consistent with the assumptions and requirements of the TMDL. Implementation of the following represents implementation to the MEP and demonstrates adequate progress.

- Implementation of NMPs.
- Implementation of MCMs related to construction site stormwater runoff control.
- Implementation of the means and methods to address discharges from New Sources.
- Implementation of the means and methods sufficient to meet the required reductions of POC loads from Existing Sources.

#### 8.2 Annual Reporting Requirements

After submittal of the CBAP, each subsequent Annual Report will include the following information related to the CBAP, where and when applicable.

- A list of BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse in accordance with Part I E 5 g of the MS4 Permit, and the estimated reduction of TN, TP, and TSS achieved by each, reported in pounds per year;
- If the permittee acquired credits during the reporting period to meet all or a portion of the required reductions in Part II A 3, A 4, or A 5 of the MS4 Permit, a statement that credits were acquired;
- The progress, using the final design efficiency of the BMPs, toward meeting the required cumulative reductions for TN, TP, and TSS; and
- A list of BMPs that are planned to be implemented during the next reporting period.

#### 8.3 **Reapplication Requirements**

During reapplication for the next MS4 Permit cycle (01 July 2023 through 30 June 2028), MCINCR-MCBQ will address any modifications to the CBAP or WIP developed during the term of their most recent permit coverage.

#### 9.0 **REFERENCES**

- 9VAC25-890, General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems, Virginia Legislative Information System. Available at https://law.lis.virginia.gov/admincode/title9/agency25/chapter890/
- Energy Independence and Security Act of 2007 (EISA), Public Law 110-140, 19 Dec. 2007, available at <u>http://www.gpo.gov/fdsys/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf</u>
- Marine Corps Base Quantico, 2019. Comprehensive Storm Water Management Plan. August 2019.
- U.S. Department of Defense, 2015. Unified Facilities Criteria (UFC). *Low Impact Development*, UFC 3-210-10, Revised 1 March 2020, available at: https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10
- U.S. Department of the Navy, 2007. Memorandum for Deputy Chief of Naval Operations (Fleet Readiness and Logistics) Deputy Commandment of the Marine Corps (Installations and Logistics), Department of the Navy Low Impact Development (LID) Policy for Storm Water Management, 16 November 2007, available at: <a href="http://www.wbdg.org/pdfs/don\_lid\_policy\_stormwater\_memo\_111607.pdf">http://www.wbdg.org/pdfs/don\_lid\_policy\_stormwater\_memo\_111607.pdf</a>
- Virginia Department of Environmental Quality, 2021. Commonwealth of Virginia Department of Environmental Quality Water Division Guidance Memo No. 20-2003 (for Chesapeake Bay TMDL Special Condition Guidance), Virginia Department of Environmental Quality, Water Division, Richmond, VA, 6 February 2021.

APPENDIX A Inventory of New BMPs (Installed 01 July 2009 and Later)

APPENDIX B Inventory of Historical BMPs (Installed 1985 – 30 June 2009)