



**Westover Air Reserve Base
MS4 (Municipal Separate Storm Sewer System)
Stormwater Management Program (SWMP)**

for coverage under the

**National Pollutant Discharge Elimination System
EPA-Massachusetts General Permit for Stormwater
Discharges from a
Small MS4**

Prepared for

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LIST OF ACRONYMS AND ABBREVIATIONS

AF	Air Force
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFRC	Air Force Reserve Command
ARB	Air Reserve Base
AW	Airlift Wing
BCE	Base Civil Engineer
BMP	Best management practice
BOS	Base Operations Support
CGP	Construction General Permit
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations ³
CSWPPP	Construction Stormwater Pollution Prevention Plan
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
FRP	Facility Response Plan
HQ	Headquarters
IDDE	Illicit Discharge Detection and Elimination
LID	Low Impact Development
MassDEP	Massachusetts Department of Environmental Protection
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-Section General Permit
MSH	Massachusetts Stormwater Handbook
NLEB	Northern Long-Eared Bat
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
SPCC	Spill Prevention, Control, and Countermeasure
SSO	Sanitary Sewer Overflow
SVF	System Vulnerability Factor
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan

TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UFS	Unified Facility Criteria
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Service
WOTUS	Waters of the United States

1. CERTIFICATION AND RECORD OF UPDATES

1.1 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 gathered and evaluated 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.

9/30/2024

X John B Moriarty

John B Moriarty

Enviro Engineer

Signed by: MORIARTY.JOHN.B.1228530170

John B. Moriarty
Chief, Environmental Engineering

Date

1.3 AUTHORIZED REPRESENTATIVE

All reports, including Stormwater Pollution Prevention Plans (SWPPPs), inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in the Appendix B, Subsection 11.A of the 2016 Final Permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described in Appendix B, Subsection 11.A of the 2016 Final Permit;
2. 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 company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
3. The signed and dated written authorization is included in the Stormwater Management Program (SWMP). A copy must be submitted to Environmental Protection Agency (EPA), if requested.

Written authorizations can be found in Appendix A of this SWMP.

1.4 RECORD OF UPDATES

The Stormwater Management Program (SWMP) will be updated and/or modified during the permit term as activities are modified, changed, or updated to meet permit conditions. Table 1-1 contains a record of the updates.

Table 1-1. Record of Updates

Revision No. and Date	Description/Revised Sections	Reviewers/Approval
Original June 2019	Full program development; All Sections	John B. Moriarty – Environmental Engineering Chief Champanine Saviengvong – Water Quality Program Manager
Revision 1 July 2020	<ul style="list-style-type: none"> • Section 3 - Added E.coli impairment of Willimansett Brook; • Section 3.1.1 – Added text to indicate that Outfall 004 discharges to an impaired waterway; • Section 4 - Updated formatting throughout; • Section 4.1.2 - Clarified target audiences justification based on base determinations; • Section 4.1.3 - Edited BMP 1a per base determination on target audiences and revised deadline and BMP details; • Section 4.1.3 - Added documentation of public education message to BMP 1a; • Section 4.1.3 – Deleted references and text from former BMPs no longer included; • Section 4.2.2 - Revised BMP 2a to indicate 2019 SWMP and Annual Report were completed; • Section 4.2.2 - Revised BMP 2b per base procedures; • Section 4.3.3 - Revised outfall rankings (BMP 3b) due to E. coli impairment to Willimansett Brook (outfall 004) and made text revisions for clarifications to BMP 3b; • Section 4.3.3 – Removed text regarding a stormwater connection to sanitary system since this is not an illicit connection per the 2016 Final Permit; • Section 4.3.3 – Revised BMP 3e for clarification and updated clarification from EPA; • Section 4.4.3 – Revised description for BMP 4a; • Section 4.4.3 – Revised title and permit citation of BMP 4b; • Section 4.4.3 – Revised title, permit citation, and description for BMP 4c; • Section 4.5 – Revised title; • Section 4.5.3 – Revised title and description of BMP 5a; • Section 4.5.3 – Revised permit citation and deadline for BMP 5c; • Section 4.6.3 – Revised title, permit citation, and/or measurable goals for BMP 6a to 6h; • Section 5 – Revised formatting and text for clarification; • Section 5.1 – Revised title of BMP 7b; • Section 5.1 – Added documentation to BMP 7e Structural BMP Tracking; • Appendix F – Populated with public education messages • Appendix O – Populated with Structural BMP Tracking sheets • Appendix P – Populated with 1st annual report 	John B. Moriarty – Environmental Engineering Chief Champanine Saviengvong – Water Quality Program Manager

Table 1-1. Record of Updates

Revision No. and Date	Description/Revised Sections	Reviewers/Approval
Revision 2 July 2021	<ul style="list-style-type: none"> • Section 2.2 – Added revision to Final Permit Description • Section 4.3.2 – Added Air Force Manuals • Section 4.3.3 – Revised BMP 3a description and documentation • Section 4.4.3 – Revised BMP 4a description and documentation • Section 4.4.3 – Revised BMP 4b description and documentation • Section 4.4.3 – Revised BMP 4c description references • Section 4.5.3 – Revised BMP 5a description and documentation • Section 4.5.3 – Updated BMP 5b to reflect completion of goals, added comparison table for stormwater requirements • Section 4.5.3 – Revised BMP 5c references • Section 4.6.3 – Revised BMP 6d description to update document references • Section 4.6.3 – Revised BMP 6e description to update document references • Section 4.6.3 – Revised BMP 6f description to update document references • Section 4.6.3 – Revised BMP 6g description to update document references • Added Appendix Q with Stormwater Policy 	<p style="text-align: center;">John B. Moriarty – Environmental Engineering Chief</p> <p style="text-align: center;">Champanine Saviengvong – Water Quality Program Manager</p>
Revision 3 June 2022	<ul style="list-style-type: none"> • Added Appendix I with Written IDDE Plan • Added Appendix L with Nitrogen Source Report • Edited text in Section 4.1.3 to better describe base activities • Revised Section 4.4 to better address the 2021 revision to the 2016 Permit. Combined BMP 4b and BMP 4c into one BMP, called BMP 4b 	<p style="text-align: center;">John B. Moriarty – Environmental Engineering Chief</p> <p style="text-align: center;">Champanine Saviengvong – Water Quality Program Manager</p>
Revision 4 June 2023	<ul style="list-style-type: none"> • Added Appendix J with IDDE Program Training • Added Appendix K with Retrofit Opportunities • Added Appendix M with Structural BMP Evaluation • Added Appendix N with Planned Structural BMPs • Updated Appendix L with retrofit opportunities identified • Updated SWMP main text to reflect added appendices • Outfall rankings and System Vulnerability Factor Inventory in Appendix I were reviewed and updated as needed. • Updated link to online access of documents • Editorial updates throughout SWMP document and appendices 	<p style="text-align: center;">John B. Moriarty – Environmental Engineering Chief</p> <p style="text-align: center;">Champanine Saviengvong – Water Quality Program Manager</p>

Table 1-1. Record of Updates

Revision No. and Date	Description/Revised Sections	Reviewers/Approval
Revision 5 June 2024	<ul style="list-style-type: none"> • Revised Appendix I with dry weather screening results • Revised Appendix N with implemented Structural BMPs • Editorial updates throughout SWMP document and appendices 	John B. Moriarty – Environmental Engineering Chief Champanine Saviengvong – Water Quality Program Manager
Revision 6		
Revision 7		

2. INTRODUCTION

Westover Air Reserve Base (Westover ARB) operates and maintains a municipal separate storm sewer system (MS4) which collects stormwater from across the base and routes it to multiple outfalls. Under the Federal Clean Water Act, Westover ARB was required to obtain coverage for discharges under the General Permit for Stormwater Discharges from Small MS4s in Massachusetts (2016 Final Permit) within 90 days of the effective permit date (1 July 2018). A complete copy of the 2016 Final Permit is included in SWMP Appendix B. Westover ARB submitted a Notice of Intent (NOI) for coverage under the 2016 Final Permit on 26 September 2018. Authorization to discharge was granted by EPA on 14 February 2019. A copy of the NOI and Authorization Letter is included as SWMP Appendix C.

This Stormwater Management Program (SWMP) was authored to fulfil the requirements of Part 1.10 of the 2016 Final Permit and outlines many existing and proposed best management practices (BMPs) to achieve full compliance with the permit. This plan will be updated during the permit term as BMPs are updated or completed. The main elements of the SWMP include the following minimum control measures (MCMs):

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination (IDDE) Program
4. Construction Site Stormwater Runoff Control
5. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)
6. Good Housekeeping and Pollution Prevention.

A checklist has been developed with recurring tasks and discrete tasks that have deadlines during the permit term and beyond. The checklist is included in SWMP Appendix D.

2.1 STORMWATER MANAGEMENT PROGRAM ORGANIZATION

The SWMP is generally organized to follow the sequence of the 2016 Final Permit.

The following portions of Section 1 provides a regulatory background, physical description of Westover ARB, identification of the individuals responsible for SWMP implementation, and documentation of the endangered species and historic properties screening. Section 2 identifies outfalls, watersheds, receiving water bodies, impaired receiving water bodies, and any additional permit requirements due to impairments. Section 2 also discusses new or increased discharges and addresses public drinking water sources. Section 3 outlines each MCM and the BMPs that are or will be implemented at Westover ARB to achieve compliance. Finally, Section 4 describes the annual program evaluation and compliance reports.

2.2 REGULATORY BACKGROUND

The Clean Water Act Amendments (Water Quality Act) of 1987 required the Environmental Protection Agency (EPA) to implement a two-phase comprehensive national program to address stormwater discharges. EPA promulgated the Phase I Stormwater Program in 1990 which required permit coverage under the National Pollution Discharge Elimination System (NPDES) from medium and large MS4s generally serving populations of 100,000 or more, certain construction activities, and certain industrial activities. The Phase II Stormwater Program (40 Code of Federal Regulations [CFR] Parts 9, 122, 123, and 124) was promulgated in 1999 and expanded permit requirements to small MS4s and other construction activities. The Phase II program applies to MS4s that serve less than 100,000 population and are located within Census designated urbanized areas.

On 1 May 2003, EPA Region 1 and the Massachusetts Department of Environmental Protection (MassDEP) issued their joint Final General Permit for Stormwater Discharges from Small MS4s (2003 Final Permit). Based on the 2000 Census, Westover ARB was not included in an urbanized area by the 2000 Census (U.S. Department of Commerce 2000) and therefore was not required to obtain coverage under the 2003 Final Permit. However, the 2010 Census included Westover ARB within the Springfield, MA – CT urbanized area (U.S. Environmental Protection Agency 2012). EPA and MassDEP issued the revised General Permits for Stormwater Discharges from Small MS4s in Massachusetts in 2016 (2016 Final Permit). Since Westover ARB was now located within a Census designated urbanized area, the base was subject to the 2016 Final Permit. Westover ARB was required to obtain authorization for discharge within 90 days of the permit's effective date. The original effective date was 1 July 2017; however, this date was extended to 1 July 2018. Westover ARB initially requested a waiver for permit coverage, however this was denied. An NOI for coverage under the 2016 Final Permit was submitted on 26 September 2018. A letter of authorization dated 14 February 2019 was received from the EPA. Both documents are included in SWMP Appendix C.

Westover ARB is considered a non-traditional MS4 because it is a federal facility. Certain requirements are modified in Part 5.0 of the 2016 Final Permit for non-traditional MS4s. Additionally, as a new permittee under the 2016 Final Permit, certain deadlines are modified by Part 1.10.3 of the permit. Modifications to standard requirements are discussed throughout this plan.

2.3 LOCATION AND AREA

Westover ARB is composed of approximately 2,511 acres of land within the communities of Chicopee and Ludlow in the northern portion of Hampden County, Massachusetts. The installation is in proximity to the Cities of Holyoke and Springfield, and the Towns of West Springfield, Granby, and South Hadley. Westover ARB is located 35 miles north of Hartford, Connecticut and 90 miles west of Boston, Massachusetts. The installation is situated approximately two miles east of the Connecticut River, and is traversed and/or bound by Cooley, Stony, and Willimansett Brooks.

State Route 33, the main thoroughfare providing access to Westover ARB, is located less than one mile west of the installation. Approximately two miles southwest of the installation, State Route 33 intersects with Interstate 90 (the Massachusetts Turnpike), an east-west route between Boston and New York State.

Westover ARB has two active runways, Runway 05-23, which is 300 feet wide by 11,600 feet long, and Runway 15-33, which is 150 feet wide by 7,082 feet long. Runway 05-23 is oriented approximately southwest to northeast, while Runway 15-33 is oriented approximately northwest to southeast. A series of taxiways extending from the flightline parking apron provide access to the runways.

The activities and operations at Westover ARB are grouped by functional areas and land use categories, including aviation support, residential, commercial, industrial, medical, administrative, public facilities/recreation, and open space. The two primary land use categories are aviation support and industrial activities, which account for more than 50 percent of all facilities and square footage.

Although the predominant land use surrounding Westover ARB is residential, a large percentage of land is devoted to commercial and industrial uses. Areas to the north and east of the installation consist mostly of rural communities with large agricultural and recreational uses; bordering Westover ARB to the south and west is the town of Chicopee. Westover ARB employs about 4,000 people.

Westover ARB is home to the 439 Airlift Wing (AW) of the Air Force Reserve Command (AFRC). The primary mission of the 439 AW is to provide worldwide air movement of troops, supplies, equipment, and medical patients. The 337th Airlift Squadron is the wing's flying unit and operates 8 C-5 Galaxy aircraft. Because of the size of the C-5 aircraft, the 439 AW specializes in missions involving outsized and oversized cargo. The 439 AW also maintains all the aircraft assigned Air Force real property, equipment, and supplies.

The 439 AW is also host to tenant organizations. The largest tenant organizations at Westover ARB are the U.S. Marine Corps Reserves and Army Reserves. In addition, the Westover Metropolitan Development Corporation is a long-term tenant at the installation, which operates an airport terminal and several hangars south of the main active aircraft flight line. These tenant organizations are covered within the scope of the storm water program operated by the 439 AW.

2.4 STORMWATER MANAGEMENT PROGRAM TEAM

Table 2-1 includes the stormwater management program team members.

Table 2-1. Stormwater Management Program Team

Name	Title	Department	Phone	Email
Champanine Saviengvong (Team Coordinator)	Water Quality Program Manager	Base Environmental Office (439 MS/CEV)	413-557-3951	champanine.saviengvong@us.af.mil
John B. Moriarty	Flight Chief	Base Environmental Office (439 MS/CEV)	413-557-2434	john.moriarty.1@us.af.mil
John Cody	Environmental Engineer	Base Environmental Office (439 MS/CEV)	413-557-3036	john.cody.9@us.af.mil

2.5 ENDANGERED SPECIES DOCUMENTATION

There are no federally-listed threatened or endangered species at Westover ARB. The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation system reveals the following information for species potentially affected by activities: Endangered Northern Long-eared Bat (NLEB); no critical habitat has been designed for this species.

A bat acoustic study, which included the NLEB was conducted by the University of Montana at various Air Force bases nationwide. Specifically, the study was conducted at Westover ARB in June 2017. The study found no presence of NLEB at Westover ARB. Subsequently, Westover processed a NLEB Streamlined Consultation form with the U.S. Fish and Wildlife Service (SWMP Appendix E). Therefore, Westover ARB falls under Criterion A for Endangered Species eligibility. The bat acoustic study is available for public review in the Base Environmental Office.

Westover also consults with the USFWS and the Massachusetts Division of Fisheries and Wildlife on our Integrated Natural Resources Management Plan which covers both wetland protection and the management of threatened and endangered species and habitats.

2.6 HISTORIC PROPERTIES DOCUMENTATION

The 2016 Final Permit requires Westover ARB to certify eligibility under this permit by ensuring that the storm water discharges, allowable non-storm water discharges, and discharge-related activities are not likely to affect a property that is either listed or eligible for listing on the National Register of Historic Places. A written certification statement is required and is included below.

No facilities at Westover ARB are listed on the National Register Information System. According to Environmental Engineering personnel at Westover ARB, no facilities on Westover ARB are listed in the National Register of Historic Places and no prior surveys or disturbances revealed the existing of historic property or artifacts. Therefore, Criterion B of 2016 Final Permit has been satisfied.

3. DISCHARGES AND RECEIVING WATER BODIES

Table 3-1 lists all outfalls, their receiving waters, and indicates any pollutants causing impairments.

Table 3-1. Outfalls and Receiving Waters

Outfall ID	Receiving Water	Impairments
001	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
002	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
003	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
004	Willimansett Brook (MA34-60) Long Island Sound	E. coli and total nitrogen
006	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
007	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
009	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen
011	Stony Brook (MA34-19) Long Island Sound	Non-native aquatic plants, E. coli, turbidity, and total nitrogen

Willimansett Brook (unnamed tributary to the Connecticut River) and Stony Brook are listed in the Massachusetts 2016 Integrated List of Waters, commonly referred to as the 303(d) list. All receiving waters discharge to the Long Island Sound, which has an approved Total Maximum Daily Load (TMDL) for nitrogen and is listed on the 2016 New York State 303(d) List of Impaired Waters.

3.1 WATER QUALITY BASED EFFLUENT LIMITATION

This section outlines the permit conditions which constitute appropriate water quality based effluent limits of the 2016 Final Permit.

3.1.1 Requirement to Meet Water Quality Standards

Part 2.1.1 of the 2016 Final Permit requires that the permittee reduce the discharge of all pollutants such that the discharges from the MS4 do not cause or contribute to an exceedance of water quality standards.

If the MS4 discharges to a waterbody that is subject to an approved TMDL identified in Part 2.2.1 of the 2016 Final Permit, the permittee is subject to the requirements of Part 2.2.1 and Permit Appendix F. Compliance with Permit Appendix F constitutes compliance with Part 2.1.1.a of the 2016 Final Permit. **The Westover MS4 discharges to waters within the watershed of the Long**

Island Sound which has an approved TMDL for Total Nitrogen. Therefore, the additional requirements to achieve compliance with Permit Appendix F are described in Section 5.1.

If the MS4 discharges to a waterbody that is water quality limited due to nutrients, metals, solids, bacteria/pathogens, chloride, or oil/grease, but is not subject to an approved TMDL, or if the MS4 is located within a municipality listed in the 2016 Final Permit Part 2.2.2.a to b, the permittee is subject to the requirements of Part 2.2.2 and Permit Appendix H. Compliance with Permit Appendix H constitutes compliance with Part 2.1.1.a of the 2016 Final Permit. **Outfall 004 discharges to Willimansett Brook (MA34-60; referred to as ‘unnamed tributary to Connecticut River’) which is impaired for bacteria. Outfall 011 discharges to Stony Brook (MA34-19) which is impaired for bacteria and solids. Therefore, the additional requirements to achieve compliance with Permit Appendix H are described in Section 5.2 and 5.3.**

If a discharge from the MS4 causes or contributes to a violation of the applicable water quality criteria for a water body, the permittee is required to reduce or eliminate the pollutant in its discharge such that the discharge meets the applicable water quality criteria as expeditiously as possible but no later than 60 days of becoming aware of the situation (2016 Final Permit Part 2.1.1.d). An exceedance of an applicable water quality criteria would be discovered as a result of routine sampling or notification from EPA or MassDEP.

3.1.2 Increased Discharges

Any increased discharge, including increased pollutant loadings through the MS4 to receiving waters are subject to the Massachusetts antidegradation regulations at 314 Code of Massachusetts Regulations (CMR) 4.04. Increased discharges, where appropriate, must comply with these regulations including information submittal requirement and obtaining authorization from MassDEP. These increased discharges must be documented in the SWMP.

There shall be no increased discharges, including increased pollutant loadings through the MS4 to impaired waters listed as Category 5 or 4b on the most recent Massachusetts Integrated Report of water listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee demonstrates that there is no net increased in loading from the MS4 to the impaired water of the pollutant for which the water is impaired.

4. MINIMUM CONTROL MEASURES

The following sections summarize the BMPs that Westover ARB employs to meet the requirements of each of the MCMs as identified by the 2016 Final Permit Part 2.3.

4.1 MCM 1 – PUBLIC EDUCATION AND OUTREACH (PERMIT PART 2.3.2)

4.1.1 Permit Excerpt and Requirement Description

The permittee shall implement an education program that includes educational goals based on stormwater issues of significance within the MS4 area. The ultimate objective of a public education program is to increase knowledge and change behavior of the public so that the pollutants in stormwater are reduced.

This MCM shall define educational goals, express specific messages, define the targeted audience for each message, and identify the responsible parties for implementation. At a minimum, this MCM shall provide information concerning the impact of stormwater discharges on water bodies within the community, especially waters that are impaired or identified as priority waters. The following topics are considered important to the audiences at Westover ARB:

- Effects of outdoor activities such as lawn care, use of pesticides, herbicides, and fertilizers
- Benefits of on-site infiltration of stormwater
- Effects of automotive work on water quality
- Maintenance of septic systems
- Building maintenance and the use detergents
- Use of salt or other de-icing/anti-icing materials
- Proper storage of materials and pollution prevention
- Proper management of waste materials and dumpsters
- Proper management of parking lot surfaces
- Proper sediment and erosion control management practices
- Information about low impact development (LID) principles and technologies
- Information about EPA's Construction General Permit (CGP).

- Proper storage of industrial materials and pollution prevention.

Documentation of messages and their reach will be included in the Annual Reports. Ineffective messages will be identified by requesting feedback from the targeted audiences. Ineffective messages or their distribution technique will be modified prior to the next message delivery.

BMP 1a has been designed to fulfil MCM 1 and the special conditions outlined in the following section. Public education outreach endeavors may be fulfilled by email, Westover's EMS (Environmental Management System) operational control **posters**, or other means. A separate educational effort is BMP 3 Employee Training described in Section 4.3.4 as required for the IDDE Program.

4.1.2 Special Conditions

Non-Traditional MS4s (Permit Part 5.1.1)

Non-traditional MS4s are required by Part 5.1.1 of the 2016 Final Permit to target the following audiences as part of this MCM: "employees, clients and customers, visitors, tenants, long-term contractors, and other contractors". Westover ARB is a limited access facility and many of these audiences are not applicable as they do not enter the base. Westover ARB has determined that the applicable target audiences for Westover ARB include **employees, tenants, and contractors**. BMP 1a targets these audiences.

New Permittees (Permit Part 1.10.3)

Part 2.3.2 sets the requirement of issuing (2) two messages over the permit term; however, this requirement is superseded by Part 1.10.3 which **modifies the requirement to only (1) message**. This part states:

Timelines for public education requirements in part 2.3.2.c shall be extended by one (1) year and need to include one (1) message to each audience over the permit term.

Accordingly, BMP 1a will be **distributed at least once** over the permit term.

Approved TMDLs (Permit Appendix F)

Two additional public education requirements are incorporated as part of this MCM because the MS4 discharges into waterbodies with an approved TMDL. Receiving waters that are part of the Connecticut River watershed fall under the Total Nitrogen TMDL for the **Long Island Sound**. Accordingly, the requirements of Appendix F Part B.I of the 2016 Final Permit apply. The additional public education requirement includes three components:

1. *The permittee shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the use of slow-release fertilizers.*

- a. **Base Determination:** At Westover ARB, the Base Civil Engineer is the single authority for making decisions on disposal methods and fertilizer selection, and the BOS Contractor is the single workforce. The BOS Contractor is allowed to carry out lawn care and fertilizer application only under specific terms of the contract. Westover does not dispose of grass clippings or leaf litter. Cut grass is left in place and leaf litter is collected, piled, and physically turned by the BOS Contractor. Any changes to lawn care and land management are manifested through contract modifications. The contractor's lawn care performance is monitored through government officials called quality assurance evaluators (QAEs). Instructions for the contractor can only be communicated through the QAEs and Base Contracting Officer.
 - b. **Summary:** Additional education regarding **grass clippings is not needed**.
2. *The permittee shall distribute an annual message in the summer (June/July) timeframe encourage the proper management of pet waste, including noting any existing ordinances where appropriate.*
 - a. **Base Determination:** Westover ARB policy prevents the allowance of pets into the workplace during business hours. Westover does not have on-Base Family Housing, thereby also making the population of pets on base negligible. Westover is a secure Federal facility where the public (and their pets) cannot enter without authorization.
 - b. **Summary:** Additional education regarding **pet waste is not needed**.
 3. *The permittee shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter.*
 - a. **Base Determination:** At Westover ARB, the Base Civil Engineer is the single authority for making decisions on disposal methods, and the BOS Contractor is the single workforce. The BOS Contractor is allowed to dispose of leaf clipping on within the specific terms of the contract. Westover does not dispose of leaf litter. Leaf litter is collected, piled, and physically turned by the BOS Contractor. Any changes to process are manifested through contract modifications. The contractor's performance is monitored through QAEs and instructions for the contractor can only be communicated through the QAEs and Base Contracting Officer.
 - b. **Summary:** Additional education regarding **leaf litter is not needed**.

Discharge to Water Quality Limited Waterbodies (Permit Appendix H)

Westover ARB's MS4 discharges into Willimansett Brook (MA34-60) and Stoney Brook (MA34-19) which are **impaired for E. coli** and is therefore subject to the requirements of Appendix H

Part III of the 2016 Final Permit. The additional public education requirement includes two components:

1. *The permittee shall supplement its residential program with an annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate.*
 - a. **Base Determination:** Westover ARB policy prevents the allowance of pets into the workplace during business hours. Westover does not have on-Base Family Housing, thereby also making the population of pets on base negligible. Westover is a secure Federal facility where the public (and their pets) cannot enter without authorization.
 - b. **Summary:** Additional education regarding **pet waste is not needed.**
2. *The permittee shall also provide information to owners of septic systems about proper maintenance in any catches that discharges to a water body impaired for bacteria or pathogens.*
 - a. **Base Determination:** At Westover ARB, the Federal Government is the sole owner of a known quantity of septic systems. The Base Civil Engineer implements the requirements of State septic system regulations called “Title V” by incorporating the directive in our long-term BOS contract. Any changes to septic tank operation and maintenance is manifested through contract modifications.
 - b. **Summary:** Additional education to owners to **septic systems is not needed.**

4.1.3 Best Management Practices

BMP 1a: Industrial Users (including Employees, Tenants, and Contractors)	MCM: Public Education Message
Permit Citation: 2016 Final Permit Part 2.3.2 as modified by Part 1.10.3 for new permittees and Part 5.1.1 for non-traditional MS4s.	
<p>Description: The Base Environmental Office (439 MS/CEV) will distribute a message via email or other means to any Base organization (including employees, tenants, and contractors) to discuss the following topics based upon ongoing industrial activities at Westover:</p> <ul style="list-style-type: none"> • auto repair, auto washing • salt or other de-icing and anti-icing materials (minimize their use) and the storage thereof (cover/prevent runoff to storm system and contamination to ground water) • storage of potential pollution-generating materials (emphasize pollution prevention) • management of waste materials and dumpsters (cover and pollution prevention) • management of parking lot surfaces (sweeping) <p>The Base continues to and does not plan to halt carrying out the following:</p> <ul style="list-style-type: none"> • Quarterly Cross Functional Team meetings to disseminate information to (shop) supervisors regarding storm water pollution prevention, spills response, and waste management. • Pre-Construction meetings to disseminate information on environmental requirements. • Facility Manager Training and MXG Block Training to disseminate information on environmental compliance. 	
Targeted Audience: Base organizations that engage in the Industrial activities as listed in MS4 Permit Section 2.3.2.d	
Responsible Department: Base Environmental Office (439 MS/CEV)	
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Distribute one message within the 6-yr term of 2017-2023.</p>	
<p>Documentation: Westover ARB delivered the following messages to complete this BMP:</p> <ul style="list-style-type: none"> • Face-to-face training of Marine Vehicle Repair Shop in October and November 2019 on Spill Prevention and Response; • Stormwater training for Aircraft Maintenance Group on 6 and 9 February 2020 (see slideshow in SWMP Appendix F); and • Posted Environmental Management System Posters throughout base on stormwater and pollution prevention topics (see example poster in SWMP Appendix F). 	

4.2 MCM 2 – PUBLIC INVOLVEMENT AND PARTICIPATION (PERMIT PART 2.3.3)

4.2.1 Permit Excerpt and Requirement Description

The permittee shall provide opportunities to engage the public to participate in the review and implementation of the permittee's SWMP.

Part 2.3.3 of the 2016 Final Permit requires that the SWMP and all annual reports be available to the public and to provide the public an opportunity to participate in the implementation of the SWMP.

4.2.2 Best Management Practices

BMP 2a: Public Review of SWMP and Annual Reports
Permit Citation: 2016 Final Permit Part 2.3.3.
Description: The Base Environmental Office (439 MS/CEV) will post the SWMP and Annual Reports to the Westover ARB's Environmental and Noise webpage.
Responsible Department: Base Environmental Office (439 MS/CEV)
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Post 2019 SWMP and Annual Report once finalized <input checked="" type="checkbox"/> Post 2020 SWMP and Annual Report once finalized <input checked="" type="checkbox"/> Post 2021 SWMP and Annual Report once finalized <input checked="" type="checkbox"/> Post 2022 SWMP and Annual Report once finalized <input checked="" type="checkbox"/> Post 2023 SWMP and Annual Report once finalized <input type="checkbox"/> Post 2024 SWMP and Annual Report once finalized <input type="checkbox"/> Post 2025 SWMP and Annual Report once finalized
Documentation/Location: The SWMP and Annual Reports will be posted at https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/

BMP 2b: Public Participation in SWMP Development
Permit Citation: 2016 Final Permit Part 2.3.3.
Description: The Base Environmental Office (439 MS/CEV) will solicit comments from the public on the SWMP for a designated period of time before it is finalized each year.
Responsible Department: Base Environmental Office (439 MS/CEV)
Measurable Goal and Deadline: <input type="checkbox"/> Solicit comments from the public on the SWMP
Documentation/Location: The SWMP will be posted at the following address and will include a contact email or phone number for delivering comments. https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/

4.3 MCM 3 - ILLICIT DISCHARGE DETECTION AND ELMINATION PROGRAM (PERMIT PART 2.3.4)

4.3.1 Permit Excerpt and Requirement Description

The permittee shall implement an IDDE program to systematically find and eliminate illicit sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges.

Part 2.3.4 of the 2016 Final Permit requires that the permittee complete several tasks in accordance with MCM 3 to prevent illicit discharges to Waters of the United States (WOTUS). Examples of these requirements include developing written procedures for the IDDE program, performing rankings of all outfalls considering potential for illicit discharges and public health concerns, and

performing catchment investigations to locate and eliminate illicit discharges. The 2016 Final Permit prohibits illicit discharges and sanitary sewer overflows (SSOs). An SSO is defined as a discharge of untreated sanitary wastewater from a sanitary sewer. An illicit discharge is defined as any discharge to a MS4 that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.

This MCM will be executed via BMPs 3a to 3e, which are described in 4.3.3.

Non-stormwater discharges permitted under the 2016 Final Permit include the following discharges. These non-stormwater discharges are allowed unless the permittee, EPA, or MassDEP determined that the discharge is a significant contributor of pollutants to the MS4. Certain discharges of industrial stormwater to the MS4 is authorized under the EPA NPDES MSGP for Stormwater Discharges Associated with Industrial Activity (Permit No. MAR050000). Refer to Westover ARB's SWPPP and the MSGP for information regarding these authorized discharges and BMPs used to prevent stormwater pollution.

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground water
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharge from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual resident car washing
- Flows from riparian habitats and wetlands
- De-chlorinated swimming pool discharges
- Street wash waters
- Residential building wash waters without detergents.

Under the 2016 Final Permit, Westover ARB is also required to:

1. Eliminate illicit discharges as expeditiously as possible upon discovery (see Part 2.3.4.2.a),
2. Eliminate SSOs as expeditiously as possible upon discovery and undertake interim mitigation measures to minimize the discharge of pollutants (see Part 2.3.4.4.a),
3. Verbally notify the EPA of all SSOs within 24 hours (see Part 2.3.4.4.c), and

4. Provide written notification of all SSOs to the EPA and MassDEP within 5 days (see Part 2.3.4.4.c).

4.3.2 Special Conditions

Non-Traditional MS4s (Permit Part 5.1.2)

Per Permit Part 5.1.2 of the 2016 Final Permit, the required ordinances, by-laws, or other regulatory mechanisms can be **replaced** by **written policies or procedures** for non-traditional permittees. Air Force Instructions (AFIs) and Air Force Manuals (AFMANs) represent the **written policies that fulfill this role** at Air Force installations such as Westover ARB. See BMP 3a.

“Some Non-traditional MS4s may not have authority to enact an ordinance, by-law, or other regulatory mechanisms. MS4s without the authority to enact an ordinance shall ensure that written policies or procedures are in place...”

New Permittees (Permit Part 1.10.3)

In addition, deadlines related to all other requirements within this MCM are extended by three years per **Part 1.10.3.a** of the 2016 Final Permit. The updated timelines are integrated into the BMP descriptions.

4.3.3 Best Management Practices

BMP 3a: Authority	MCM: IDDE
<p>Permit Citation: 2016 Final Permit Part 2.3.4.a as modified by Part 1.10.3.a for new permittees and Part 5.1.2 for non-traditional MS4s.</p>	
<p>Description: The Base Civil Engineer (BCE) has institutional control over all components of the MS4 system and all facilities at Westover ARB. This institutional control allows the BCE to investigate and enforce an IDDE program. An IDDE program is required by Air Force Manual (AFMAN) 32-1067 Water and Fuel Systems Chapter 5.4.1.4., “Installations shall correct cross-connections and illicit discharges identified through inspections by elimination, operational modifications, repairs or construction.” This AFMAN applies to all Air Force Reserve Command (AFRC) installations such as Westover ARB. The AFMAN specifically requires the BCE to operate and maintain the wastewater and stormwater system across the facility in accordance with applicable permits, standards, laws, and regulations. Therefore, BCE has the legal authority to investigate and eliminate illicit discharges under AFMAN32-1067.</p>	
<p>Responsible Department: Base Civil Engineer</p>	
<p>Measurable Goal and Deadline: <input checked="" type="checkbox"/> As a non-traditional MS4, AFMAN32-1067 serves as the written authority and is in effect at Westover ARB. This requirement is fully satisfied.</p>	
<p>Documentation/Location: The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</p>	

BMP 3b: IDDE Program & Written Plan	MCM: IDDE
<p>Permit Citation: 2016 Final Permit Part 2.3.4.6, 2.3.4.7, 2.3.4.8, and 2.3.4.10 as modified by Part 1.10.3.a for new permittees and Permit Appendix H Part III.2.a.ii for discharges to bacteria impaired waters.</p>	
<p>Description: The IDDE Program consists of multiple phases with varying deadlines. The first phase includes developing the IDDE Program written procedures (including dry weather screening and sampling procedures and catchment investigation procedures), completing an outfall inventory, and compiling an initial priority ranking of the outfalls. The second phase includes performing dry weather screening and sampling. The third phase includes performing catchment investigations on all problem, high-priority, and low-priority outfalls.</p> <p>Manhole inspection methodology should include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. Conduct investigations on all catchments even if flow direction is known. Note that this is for KEY junction manholes and that definition is left up to the permit holder as long as the design of the program does not limit the ability to locate illicit connections. If Permittees have a good understanding of their assets, then should be able to identify the required manholes for inspection and will not need to open everything.</p>	
<p>Responsible Department: Base Environmental Office (439 MS/CEV)</p>	
<p>Measurable Goals and Deadlines:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Develop IDDE Program written procedures by 30 June 2022. <i>This has been completed. The written IDDE Program is in Appendix I of the SWMP.</i> <input checked="" type="checkbox"/> Complete Initial Outfall Rankings by 30 June 2022. <i>This has been completed. Rankings will be updated upon completion of dry weather screening and sampling. <u>The current ranking results are: eight high priority outfalls</u></i> <input checked="" type="checkbox"/> Conduct Dry Weather Screening and Sampling by 30 June 2024. <i><u>Continue performing Dry Weather Screening and, if applicable, Sampling every 5 years. This has been completed, dry weather screening was completed in March 2024, and results are described in Appendix I.</u></i> <input checked="" type="checkbox"/> Begin Catchment Investigations of all problem outfalls by 30 June 2023. <i><u>Not currently applicable to Westover ARB because no “problem” outfall has been identified during the initial ranking.</u></i> <input type="checkbox"/> Complete Catchment Investigations of Problem Outfalls by 30 June 2028. <i><u>Not currently applicable to Westover ARB because no “problem” outfall has been identified during the initial ranking. MS4 Permit Part 2.3.4.7.b.iii requires screening records to include receiving water, date of most recent inspection, dimensions, shape, material (concrete, PVC), spatial location, physical condition. We already have those physical characteristics for most of our stormwater conveyance system.</u></i> <input type="checkbox"/> Begin Catchment Investigations on High and Low Priority Outfalls after rankings are updated based on Dry Weather Screening and Sampling. <input type="checkbox"/> Complete Catchment Investigations of High and Low Priority Outfalls by 30 June 2031. <input type="checkbox"/> Perform Wet Weather Sampling on any catchments identified with System Vulnerability Factors (SVFs) during the Catchment Investigations. Continue performing Wet Weather Sampling on catchments with SVFs every 5 years. 	
<p>Documentation/Location: The IDDE Program written procedures, initial rankings, updated rankings, dry weather screening and sampling results, catchment investigation results, and wet weather sampling results (if required) will be attached to this plan as Appendix I and will be attached to the appropriate annual reports.</p>	

BMP 3c: Sanitary Sewer Overflow Inventory	MCM: IDDE
Permit Citation: 2016 Final Permit Part 2.3.4.4.b and Part 2.3.4.4.d as modified by Part 1.10.3.a for new permittees	
Description: Annually track and report the following SSO information: the location; a clear statement of whether the discharge entered a surface water directly or entered the MS4; date(s) and time(s) of each known SSO occurrence; estimated volume(s) of the occurrence; description of the occurrence indicating known or suspected cause(s); mitigation and corrective measures completed with dates implemented; and mitigation and corrective measures planned with implementation schedules. Update inventory as needed. Perform notifications upon discovery of SSOs to EPA and MassDEP (see Part 2.3.4.4.c).	
Responsible Department: Base Environmental Office (439 MS/CEV)	
Measurable Goal and Deadline:	
Measurable Goals and Deadlines:	
<input checked="" type="checkbox"/> Complete a written inventory of SSOs within the past 5 years by 30 June 2022. <i>This has been completed. Westover has had zero incidences of sanitary sewer overflows. Westover does not have any sanitary sewer appurtenances allowing flow into stormwater outfalls or stormwater appurtenances.</i>	
<input type="checkbox"/> Update the inventory annually.	
Documentation/Location: The latest inventory is attached to this plan as Appendix G and will be attached to each annual report.	

BMP 3d: Mapping of MS4 System (Phase I and Phase II)	MCM: IDDE
Permit Citation: 2016 Final Permit Part 2.3.4.5.a for Phase I and Part 2.3.4.5.b for Phase II as modified by Part 1.10.3.a for new permittees.	
Phase I Description: Map 100% of outfalls and receiving waters, open channel conveyances, interconnections with other MS4s and other storm sewer systems, municipally-owned stormwater treatment structures, waterbodies identified by name and indication of all use impairments, and catchment delineations.	
Phase II Description: Map 100% of outfall spatial locations, pipes, manholes, catch basins, refined catchment delineations, municipal sanitary sewer system (if available), and municipal combined sewer system (if applicable). Phase II mapping will include results of any catchment investigations performed as part of BMP 3d.	
Responsible Department: Base Environmental Office (439 MS/CEV)	
Measurable Goals and Deadlines:	
<input checked="" type="checkbox"/> Complete Phase I Mapping by 30 June 2023. <i>This has been completed.</i>	
<input type="checkbox"/> Update Phase II Mapping upon completion of any catchment investigations and complete by 30 June 2031.	
Documentation/Location: The latest map is attached to this plan as Appendix H and will be attached to each annual report.	

BMP 3e: Employee Training	MCM: IDDE
Permit Citation: 2016 Final Permit Part 2.3.4.11 as modified by Part 1.10.3.a for new permittees.	
Description: The Base Environmental Office (439 MS/CEV) will perform IDDE program training, including how to recognize illicit discharges and SSOs.	
Targeted Audience: Employees with IDDE Program responsibilities.	
Responsible Department: Base Environmental Office (439 MS/CEV)	
Measurable Goal and Deadline:	
<input checked="" type="checkbox"/> Perform annual training for all employees involved in the IDDE program, beginning the year following completion of the IDDE Program written procedures (BMP 3b; 30 June 2022). It was indicated by EPA that the Permit Part 1.10.3 deadline extension pertains to IDDE training as well. Initial training is anticipated to occur between 1 July 2022 and 30 June 2023. <i>The training program has been developed and is included in Appendix J. Training will be distributed to employees and completed by 30 June 2023. A record of training will be maintained that indicates when employees complete the training.</i>	
Documentation: The training is attached to this plan (SWMP Appendix J) and to the Annual Reports.	

4.4 MCM 4 - CONSTRUCTION SITE STORMWATER RUNOFF CONTROL (PERMIT PART 2.3.5)

4.4.1 Permit Excerpt and Requirement Description

The objective of an effective construction stormwater runoff control program is to minimize or eliminate erosion and maintain sediment on site so that it is not transported in stormwater and allowed to discharge to a water of the U.S. through the permittee's MS4.

Part 2.3.5 of the 2016 Final Permit requires that the permittee implements and enforces a program to reduce pollutants in any stormwater runoff from construction activities. Permit requirements include an ordinance or regulatory mechanism requiring erosion and sediment control, written **procedures for site inspections and enforcement**, requirements for construction site operators performing land disturbances to implement a sediment and erosion control program and to control wastes, and **written procedures for pre-construction site plan reviews**.

BMPs 4a to 4c have been designed to fulfil the requirements of this MCM and the special conditions outlined below.

4.4.2 Special Conditions

Non-Traditional MS4s (Permit Part 5.1.2)

For non-traditional permittees, the required ordinances, by-laws, or other regulatory mechanisms are replaced by written policies or procedures by Part 5.1.2 of the 2016 Final Permit. AFIs and AFMANs represent the Air Force's written policies that fulfill this role at Air Force installations. These written policies are already in place in Westover ARB.

New Permittees (Permit Part 1.10.3)

Deadlines related to all other requirements within this MCM are extended by two years by Part 1.10.3.a of the 2016 Final Permit. The updated timelines are integrated into the BMP descriptions.

4.4.3 Best Management Practices

BMP 4a: Construction Site Stormwater Authority	MCM: Construction Sites
<p>Permit Citation: 2016 Final Permit Part 2.3.5.a. and 2.3.5.c.i, as modified by Part 1.10.3.a for new permittees and Part 5.1.2 for non-traditional MS4s.</p>	
<p>Description: The BCE has institutional control over all construction projects at Westover ARB. This institutional control allows the BCE to investigate and enforce a sediment/erosion control and pollution prevention program. Compliance with the NPDES CGP and development of a Construction Stormwater Pollution Prevention Plan (CSWPPP) is required by AFMAN32-1067 Water and Fuel Systems Chapter 6.3. 2016 Final Permit also requires the facility to follow the Massachusetts Stormwater Handbook, which notes that all projects disturbing one or more acres of land are required to obtain coverage under the NPDES Construction General Permit issued by EPA, which describes methods and requirements of construction erosion, sedimentation, and pollution control. Based on these two documents, BCE has the legal authority to impose erosion and sediment controls at construction sites.</p>	
<p>AFMAN 32-1067 states “6.1. Stormwater System Design. The Base Civil Engineer shall design surface drainage, underground drainage systems, stormwater management facilities, and erosion and sediment control in accordance with UFC 3-201-01, Civil Engineering, and applicable requirements of the local regulatory agency with jurisdiction over the installation; UFC 3-210-10, Low Impact Development; applicable Leadership in Energy and Environmental Design credits; and the criteria noted in this AFMAN. (T-0). When there is a conflict between the criteria, installations will follow the most stringent criteria. (T-0). Other important construction-related stormwater references include, UFC 1-200-02, High Performance and Sustainable Building Requirements; and USEPA 841-B-09-001, Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence Security Act.”</p>	
<p>Responsible Department: Base Civil Engineer</p>	
<p>Measurable Goal and Deadline: <input checked="" type="checkbox"/> As a non-traditional MS4, <i>AFMAN32-1067 serves as the written authority and is in effect at Westover ARB. This requirement is fully satisfied.</i></p>	
<p>Documentation/Location: The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf The latest version of NPDES General Construction Permit is located at the following web address: https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents</p>	

BMP 4b: Written Procedures for Site Plan Review, Inspections, and Enforcement of Sediment and Erosion Control Measures	MCM: Construction Sites
<p>Permit Citation: 2016 Final Permit Parts 2.3.5.c.ii and 2.3.5.c.iii, as modified by Part 1.10.3.a for new permittees and Part 5.1.2 for non-traditional MS4s.</p>	
<p>Description: AFMAN 32-1067 and AFI 32-1023 provide authority and written guidelines to meet the requirements of Permit Section 2.3.5.c. The permit requires a construction site stormwater runoff control program that is separate and distinct from the EPA’s Construction General Permit, as described in Permit Section 2.3.5.</p> <p>Permit Section 2.3.5.c.ii requires written procedures for site plan review, site inspections, and enforcement of sediment and erosion control measures. Enforcement is granted to Westover as BCE has institutional control over all construction at Westover ARB. Section 2.16 of AFI 32-1023 describes the role of BCE and their responsibilities, including review of plans and coordinating environmental permits and compliance. Section 2.18 of AFI 32-1023 describes the role of the Design Manager and Construction Manager, who are responsible for monitoring design and construction progress of projects. The Construction Manager will notify the environmental planning personnel of any changes in design or other issues that may impact environmental analysis. The DoD Construction Agent is DoD component responsible for performing the contracting function and overseeing the technical execution of military construction projects, as described in Section 2.19 of AFI 32-1023.</p> <p>Permit Section 2.3.5.c.iii requires all construction work disturbing land activity to develop and implement a stormwater pollution prevention plan. Per Section 6.3.1 of AFMAN 32-1067: “A site specific stormwater pollution prevention plan must be prepared and implemented per permit requirements. The civil engineer installation management flight will review proposed construction activities to determine whether exemptions to submitting a Notice of Intent are available. Attention should be given to permitting authority-specific requirements such as: parties submitting a Notice of Intent, signatory authority, preparing and keeping a copy of the stormwater pollution prevention plan on-site; statutory waiting period after submission of the Notice of Intent before construction can begin; and permit fees.” This excerpt is in reference to any construction project that disturbs one or more acres of land.</p>	
<p>Responsible Department: Base Civil Engineer</p>	
<p>Measurable Goals and Deadlines:</p> <p><input checked="" type="checkbox"/> Develop written procedures for site inspections and enforcement of sediment and erosion control measures by 30 June 2021 (within 3 years of permit effective date). <i>NPDES General Construction Permit is currently required at Westover ARB and this requirement is fully satisfied.</i></p>	
<p>Documentation/Location:</p> <p>Additional details on the procedure for inspections can be found after this block.</p> <p>The latest version of NPDES General Construction Permit is located at the following web address: https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents</p>	

Westover's Procedures for "site plan review" includes the following:

- A pre-construction review by the permittee of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development
- Consideration of potential water quality impacts;
- Evaluating the incorporation of Low Impact Development (LID) site planning and design strategies, unless such practices are infeasible.

Appropriate erosion and sediment controls implemented as part of this MCM include:

- Minimize the amount of disturbed area and protection natural resources
- Stabilize sites when projects are complete, or operations have temporarily ceased
- Protect slopes on the construction site
- Protect all storm drains inlets and armor all newly constructed outlets
- Use perimeter controls at the site
- Stabilize construction site entrances and exits to prevent off-site tracking
- Inspection stormwater controls at consistent intervals.

Tracking of the number of site reviews, inspections, and enforcement actions shall be included as part of each annual report as required by the Permit.

4.5 MCM 5 – POST CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT (PERMIT PART 2.3.6)

4.5.1 Permit Excerpt and Requirement Description

The objective of an effective post construction stormwater management program is to reduce the discharge of pollutants found in stormwater to the MS4 through the retention or treatment of stormwater after construction on new or redeveloped sites and to ensure proper maintenance of installed stormwater controls.

The first part of MCM 5 requires the permittee to develop a written policy for post-construction stormwater management (Permit Part 2.3.6.a). The policy must address, at a minimum:

1. Using LID site planning and design strategies to the greatest feasible extent.

2. Using Volume 2 of the Massachusetts Stormwater Handbook (MSH), or other federal or state approved BMP design guidance, for design guidance of stormwater runoff treatment and infiltration measures.
3. Requiring *stormwater management systems* on new development and redevelopment construction projects.
4. All projects shall be required to submit as-built drawings no later than two years after completion of the project.

The second part of MCM 5 requires the permittee to compile a report evaluating current street design and parking lot guidelines to determine if changes to these guidelines can be made to support LID options (Permit Part 2.3.6.b).

The third part of MCM 5 requires the permittee to compile a report assessing the feasibility of making green roofs, infiltration practices, and water harvesting devices and the use of non-potable water allowable (Permit Part 2.3.6.c). This report is not applicable to non-traditional permittees (Permit Part 5.1.3).

The fourth part of MCM 5 requires the permittee to identify a minimum of five permittee-owned properties that could be potentially modified to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from the MS4 (Permit Part 2.3.6.d). Property identification and project priority ranking shall consider BMPs that would reduce nitrogen discharges (Permit Appendix F, Part B.I.1.a.i.2)

4.5.1.1 Stormwater Management Systems for New Developments

A **new development (or new construction)** is defined as any construction activities or land disturbance resulting in total earth disturbances equal or greater than 1 acre, or part of a greater plan of development disturbing greater than 1 acre, on an area that has not previously been developed to include impervious cover. The *stormwater management system* requirements for new construction include:

1. Not allow new stormwater conveyances to discharge untreated stormwater in accordance with MSH Standard 1.
2. Control peak runoff rates in accordance with MSH Standard 2.
3. Recharge groundwater in accordance with MSH Standard 3.
4. Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the MSH in accordance with Standard 5.

5. Protect Zone II and Interim Wellhead Protection Areas of public water supplies in accordance with MSH Standard 6.
6. Implement long term maintenance practices in accordance with MSH Standard 9.
7. Require that all stormwater management systems be designed to:
 - a. Retain the volume of runoff equivalent to, or greater than, one inch multiplied by the total post-construction impervious surface area on the site and/or;
 - b. Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site and 60% of the average annual load of Total Phosphorus generated from the total post-construction impervious area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or another approved tool.
8. Require that all BMPs be optimized for nitrogen removal. (Permit Appendix F, Part B.I.1.a.i.2)

4.5.1.2 Stormwater Management Systems for Redevelopments

A **redevelopment** project is defined as any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbance equal or greater than 1 acre, or part of a greater plan of development disturbing greater than one acre, that does not meet the definition of new development above. A redevelopment project is also defined in the MSH. The *stormwater management system* requirements for redevelopment projects include:

1. Not allow new stormwater conveyances to discharge untreated stormwater in accordance with MSH Standard 1 to the maximum extent feasible.
2. Control peak runoff rates in accordance with MSH Standard 2 to the maximum extent feasible.
3. Recharge groundwater in accordance with MSH Standard 3 to the maximum extent feasible.
4. Meet the pretreatment and structural best management practices requirements of Standard 5 to eliminate or reduce discharge of pollutants from land uses with higher pollutant loads to the maximum extent feasible.
5. Meet the pretreatment and structural best management practices of MSH Standard 6 to protect Zone II and Interim Wellhead Protection Areas of public water supplies to the maximum extent feasible.
6. Require that all stormwater management systems be designed to:

- a. Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site, and/or;
 - b. Remove 80% of the average annual load of TSS generated from the total post-construction impervious area on the site and 50% of the average annual load of Total Phosphorus generated from the total post-construction impervious area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or another approved tool.
 - c. These requirements may be met using offsite mitigation within the same United State Geologic Service Hydrologic Unit Code 10 hydrologic unit.
7. Require that all BMPs be optimized for nitrogen removal. (Permit Appendix F, Part B.I.1.a.i.2)

4.5.1.3 Stormwater Management for Maintenance and Improvements of Existing Roadways

For projects that are restricted to **maintenance and improvements of existing roadways** (such as widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving), the projects are required only to improve conditions where feasible (i.e. lower peak discharge rates and runoff volume). Projects that widen roadways or other improvements that add impervious area greater than or equal to a single lane width shall meet the requirements for redevelopments fully.

4.5.2 Special Conditions

Non-Traditional MS4s (Permit Part 5.1.2)

For non-traditional permittees, the required ordinances, by-laws, or other regulatory mechanisms are replaced by written policies or procedures, per Part 5.1.2 of the 2016 Final Permit.

New Permittees (Permit Part 1.10.3)

Deadlines related to all requirements within this MCM are extended by two years by Part 1.10.3.a of the 2016 Final Permit. The updated timelines are integrated into the BMP descriptions.

Approved TMDLs (Permit Appendix F)

Because all of the receiving waters are within the watershed of the Long Island Sound, which is impaired for total nitrogen, an additional permit condition is required by the 2016 Final Permit Appendix F Part B.I.1.a.i.2. The requirement is that the written policy shall include a requirement that stormwater management BMPs be optimized for nitrogen removal. The retrofit opportunities required by Part 2.3.6.d also must include consideration of BMPs which reduce nitrogen discharges.

Discharge to Water Quality Limited Waterbodies (Permit Appendix H)

Because Stoney Brook is impaired for solids, additional permit conditions are required by the 2016 Final Permit Appendix H Part V. The requirement includes the incorporation of isolation valves into new or redevelopment stormwater management systems. Because the site is already covered by a Spill Prevention, Control, and Countermeasure (SPCC) Plan, and subject to the requirements of the Oil Pollution Act, this requirement is fulfilled.

4.5.3 Best Management Practices

BMP 5a: Post Construction Stormwater Management Authority	MCM: POST Construction Stormwater Management
Permit Citation: 2016 Final Permit Part 2.3.6.a as modified by Part 1.10.3.a for new permittees, Part 5.1.2 for non-traditional MS4s, and Permit Appendix F Part B.I.1.a.i.2 for Nitrogen TMDL Requirements.	
<p>Description: The Base Civil Engineer has institutional control over the Base Environmental department and Base inspection and maintenance personnel who will carry out post construction stormwater management. BCE is required to adhere to the following Government documents: AFMAN 32-1067 Water and Fuel Systems, and Massachusetts Stormwater Handbook</p> <p>AFMAN 32-1067 Water and Fuel Systems requires that the BCE shall operate and maintain stormwater facilities within applicable permit limits and according to relevant guidance in the applicable CE Playbook.</p> <p>Massachusetts Stormwater Handbook states that post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas can significantly affect receiving water bodies. This Permit provides a Permanent Storm Water Controls O&M Guidance document including checklists for inspecting permanent stormwater treatment structures.</p> <p>EISA 438 is the written authority for federal development and redevelopment projects that include “buildings” to meet storm water runoff requirements. See the next BMP for further details.</p>	
Responsible Department: Base Civil Engineer	
Measurable Goal and Deadline:	

BMP 5a: Post Construction Stormwater Management Authority	MCM: POST Construction Stormwater Management
<input checked="" type="checkbox"/> Air Force Instructions and Engineering Technical Letters are already in place.	
<p>Documentation/Location:</p> <p>The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</p> <p>The latest version of NPDES General Construction Permit is located at the following web address: https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents</p> <p>EISA 438 can be found at the following web address: https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act</p>	

BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more	MCM: POST Construction Stormwater Management
<p>Permit Citation:</p> <p>2016 Final Permit Part 2.3.6.a as modified by Part 1.10.3.a for new permittees, Part 5.1.2 for non-traditional MS4s, and Permit Appendix F Part B.I.1.a.i.2 for Nitrogen TMDL Requirements.</p>	
<p>Description: The Base’s design requirements must be at least as stringent as the MA Handbook Standards that are specifically called out in Permit Part 2.3.6.a.ii.</p> <p>For applicable projects that are one acre or more, the Base will implement a program to:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Address nitrogen removal BMP requirements of Permit Appendix F Part B.I.1.a.i.2 <input checked="" type="checkbox"/> Use LID site planning and design strategies to the greatest feasible extent. Reference existing guidance – Unified Facility Criteria 3-210-10 Low Impact Development. <input checked="" type="checkbox"/> Address post construction runoff that meets the retention and treatment requirements of Part 2.3.6.a.ii.3 and Part 2.3.6.a.ii.4. SWMP will include comparison of MA Handbook Standards with EISA/UFC.) EISA 438 is the written authority for federal development and redevelopment projects that include both aspects of being a “building” development and also has a footprint that exceeds 5,000 square feet. EISA 438 requires the design 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. However EISA differs from the MS4, in that MS4 runoff management requirement applies to a broader category of any land disturbance greater than one acre resulting from development/redevelopments, whereas EISA applies to only “buildings”. <p>AFMAN 32-1067 states “6.1. Stormwater System Design. The Base Civil Engineer shall design surface drainage, underground drainage systems, stormwater management facilities, and erosion and sediment control in accordance with UFC 3-201-01, Civil Engineering, and applicable requirements of the local regulatory agency with jurisdiction over the installation; UFC 3-210-10, Low Impact Development; applicable Leadership in Energy and Environmental Design credits; and the criteria noted in this AFMAN. (T-0). When there is a conflict between the criteria, installations will follow the most stringent criteria. (T-0). Other important construction-related stormwater references include, UFC 1-200-02, High Performance and Sustainable Building Requirements; and USEPA</p>	

BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more	MCM: POST Construction Stormwater Management
841-B-09-001, Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence Security Act.”	
Responsible Department: Base Civil Engineer	
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop a written policy by 30 June 2021.	
Documentation/Location: Development Policy to Enact Design Requirements for Runoff Management is included in SWMP Appendix Q Comparison of MA Handbook Standards to EISA/UFC requirements included at the end of this section. EISA 438 can be found at the following web address: https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act EPA’s EISA guidance document can be found at the following website: https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf	
BMP 5c: Written Procedures for As-built Drawing Submittals & Long Term O&M (For sites that disturb 1 acre or more)	MCM: POST Construction Stormwater Management
Permit Citation: 2016 Final Permit Part 2.3.6.a as modified by Part 1.10.3.a for new permittees, Part 5.1.2 for non-traditional MS4s, and Permit Appendix F Part B.I.1.a.i.2 for Nitrogen TMDL Requirements.	
Description: The Base will implement a program for: <input checked="" type="checkbox"/> Submission of as-built drawings no later than two (2) years after completion of construction projects <ul style="list-style-type: none">• AFI 32-1023 Designing and Constructing Military Construction Projects Chapter 2.3.2 requires a comprehensive design and review process for all construction projects at Westover ARB, which includes as-built drawing submissions and development of operation and maintenance procedures. This process includes reviews by the designated Design Agent, Design Manager, Base Civil Engineer, and Major Command. <input checked="" type="checkbox"/> Long-term operation and maintenance of stormwater management structures <ul style="list-style-type: none">• Written procedures for long-term O&M of stormwater management structures already exist and take the form of the existing scope of work of the BOS contract. Refer to Tab F of the Base Operating Service (BOS) contract.	
Responsible Department: Base Civil Engineer	
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop a written procedure by 30 June 2021. BOS contract execution of stormwater treatment structure O&M and AFI 32-1023 are both already in effect.	
Documentation/Location: The latest version of AFI32-1023 is located at the following web address:	

BMP 5c: Written Procedures for As-built Drawing Submittals & Long Term O&M (For sites that disturb 1 acre or more)	MCM: POST Construction Stormwater Management
https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf	
Due to “For Official Use Only” concerns, a copy of the BOS contract will not be posted on the internet, rather, a copy will be provided to EPA via email and/or mail.	

BMP 5d: Report Assessing Street Design and Parking Lot Guidelines	MCM: Post Construction Stormwater Management
Permit Citation: 2016 Final Permit Part 2.3.6.b as modified by Part 1.10.3.a for new permittees.	
Description: A brief evaluation of current street and parking lot design guidelines is presented below to evaluate the potential of changing these guidelines to support the use of LID technologies.	
Responsible Department: Base Environmental Office (439 MS/CEV)	
Measurable Goals and Deadlines:	
<input checked="" type="checkbox"/> Write report assessing current street and parking lot design guidelines by 30 June 2024. <i>This has been completed, see documentation section below.</i>	
Documentation/Location:	
Street and parking lot designs on Air Force facilities are required to follow Unified Facilities Criteria (UFC) 3-250-01 Pavement Design for Roads and Parking Areas and UFC 3-210-10 Low Impact Development. These UFCs aim to maintain pre-development hydrology through the use of LID techniques where feasible. For instance, UFC 3-210-10 specifically requires consideration of bioretention areas, permeable pavements, cisterns, and green roofs. LID technologies are evaluated based on their cost effectiveness and ability to keep post-construction discharges and volumes lower than pre-construction discharges and volumes. Therefore, Westover ARB determines that no changes to these regulations are required. The latest versions of UFC 3-250-01 and UFC 3-210-10 are available at the following web addresses:	
https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-250-01	
https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10	

BMP 5e: List of Retrofit Opportunities	MCM: Post Construction Stormwater Management
Permit Citation: 2016 Final Permit Part 2.3.6.d as modified by Part 1.10.3.a for new permittees and Permit Appendix F Part B.I.1.a.i.2 and Part B.I.1.c.i for Nitrogen TMDL Requirements.	
Description: A list of five permittee-owned properties that could potentially be modified with BMPs designed to reduce the frequency, volume, or pollutant loads of stormwater discharges to the MS4. Properties and infrastructure for consideration shall include those with the potential for impervious area reduction and nitrogen runoff reduction.	
Part 1.10.3.a allows for a delay of the deadline for this requirement for new permittees, however Permit Appendix F Part B.I.1.c.i requires a BMP evaluations dependent on identification of the retrofit opportunities at Westover ARB with a deadline of 30 June 2023. Therefore, the deadline for this BMP is set to match.	
<i>This is complete, a list of potential stormwater improvement opportunities is included in SWMP Appendix K, with a description of each opportunity and the potential impacts they would provide.</i>	
Responsible Department: Base Environmental Office (439 MS/CEV)	

Measurable Goal and Deadline:

Compile a list of five potential retrofit opportunities by 30 June 2023.

Documentation/Location:

The list will be attached to this plan (SWMP Appendix K) and to the appropriate Annual Reports.

Stormwater Handbook and UFC Requirement Comparison – As required in BMB 5b

The requirements of the UFC relate to designing post-development hydrology that does not exceed pre-development hydrology, using stormwater management techniques. This is a similar requirement to Massachusetts Stormwater Handbook Standard 2. Compliance with one set of requirements does not ensure compliance with the other. The MS4 SWMP requires compliance with all standards of the Massachusetts Stormwater Handbook.

Massachusetts Stormwater Handbook Standards	Unified Facilities Criteria (UFC) for Low Impact Development
<i>MS4 Applicability: Any new development greater than one acre or redevelopment that increases impervious surfaces by at least one acre.</i>	<i>Applicability: Any permanent building construction or redevelopment with an impervious footprint increase greater than 5,000 square feet.</i>
1. No new stormwater conveyances may discharge untreated stormwater directly or cause erosion in wetlands or waters of the commonwealth.	No applicable comparison.
2. Stormwater management systems must be designed so post-development discharge does not exceed pre-development discharge. Methodology is discussed more in the Stormwater Handbook.	The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall 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. Total volume of the 95 th percentile storm must be managed or Pre-development hydrology must be modelled using site specific conditions and water volume to manage will be determined.
3. Loss of annual recharge to groundwater shall be eliminated or minimized. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.	No applicable comparison.
4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).	No applicable comparison.
5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook. If	No applicable comparison.

Massachusetts Stormwater Handbook Standards	Unified Facilities Criteria (UFC) for Low Impact Development
through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.	
6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “storm water discharge” as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.	No applicable comparison.
7. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.	No applicable comparison.
8. A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.	No applicable comparison.
9. A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.	No applicable comparison.
10. All illicit discharges to the stormwater management system are prohibited.	No applicable comparison.

4.6 MCM 6 - GOOD HOUSEKEEPING AND POLLUTION PREVENTION (PERMIT PART 2.3.7)

4.6.1 Permit Excerpt and Requirement Description

The permittee shall implement an operations and maintenance program for permittee-owned operations that has a goal of preventing or reducing pollutant runoff and protecting water quality from all permittee-owned operations.

The intent of this MCM is to require operation and maintenance of permittee-owned properties in a manner that reduces pollutant discharges to and from the MS4. Because Westover ARB is a wholly controlled institution, all properties throughout the facility are operated and maintained by the Air Force or other tenants in strict compliance with Department of Defense and Air Force requirements which require compliance with federal, state, and local permits. Accordingly, this MCM is fulfilled by existing plans and guidelines generated for Westover ARB in compliance with Air Force requirements or other permits.

4.6.2 Special Conditions

New Permittees (Permit Part 1.10.3)

Deadlines related to requirements within this MCM are extended by two years by Part 1.10.3.a of the 2016 Final Permit. The updated timelines are integrated into the BMP descriptions.

Approved TMDLs (Permit Appendix F)

Because all of the receiving waters are within the watershed of the Long Island Sound, which is impaired for total nitrogen, additional requirements are imposed by Permit Appendix F Part B.I.1.a.3. These requirements include:

- 1. Establish requirement for use of **slow release fertilizers**.*
- 2. Establish procedures to properly manage grass cuttings and leaf litter.*
- 3. Increased street sweeping frequency to a minimum of two times per year, once in the spring (following winter sanding) and once in the fall (following leaf fall).*

Discharge to Water Quality Limited Waterbodies (Permit Appendix H)

Because Stoney Brook is impaired for solids additional permit conditions are required by the 2016 Final Permit Appendix H Part V. The Good Housekeeping BMPs must have higher frequency inspections of catch basins and street sweepings. Because Westover ARB already employs increased frequencies for these activities, this requirement is fulfilled.

4.6.3 Best Management Practices

BMP 6a: Parks and Open Spaces	MCM: Good housekeeping and Pollution Prevention
<p>Permit Citation: 2016 Final Permit Part 2.3.7.a.ii as modified by Part 1.10.3.a for new permittees and Permit Appendix F Part B.I.1.a.3 for Nitrogen TMDL Requirements.</p>	
<p>Description: Operation and maintenance procedures for parks and open spaces, including an inventory of these areas, are already established at Westover ARB. These procedures are outlined by the Integrated Natural Resources Management Plan (Air Force Reserve Command 2016) and the Vegetation Management Plan (US Forest Service 2015). These plans require the protection of natural resources, including stormwater discharge, through the implementation of several good housekeeping BMPs. For instance, the Integrated Natural Resources Management Plan indicates that fertilizer use on Westover ARB is minimized to the maximum extent possible to protect water resources.</p>	
<p>Responsible Department: Monitored by the Base Civil Engineer and implemented by the Base Operations Support (BOS) contractor.</p>	
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Develop written operation and maintenance procedures for parks and open spaces and an inventory of these areas by 30 June 2022. <i>These procedures are contained in the reports referenced above and are enforced at Westover ARB. These plans include a written inventory of parks and open spaces. This requirement is satisfied.</i></p>	
<p>Documentation/Location:</p> <p>The latest version of the Integrated Natural Resources Management Plan and the Vegetation Management Plan are maintained by the Base Environmental Office and are available for public review upon request.</p>	

BMP 6b: Buildings and Facilities	MCM: Good housekeeping and Pollution Prevention
Permit Citation: 2016 Final Permit Part 2.3.7.a.ii as modified by Part 1.10.3.a for new permittees.	
Description: Operation and maintenance procedures for buildings and facilities where pollutants are exposed to stormwater, including an inventory of these areas, are already established at Westover ARB. Because Westover ARB is subject to the EPA MSGP, a site-wide SWPPP has been developed, is constantly updated, and includes good housekeeping and operation and maintenance requirements for areas where pollutants are exposed to stormwater. The SWPPP involves frequent inspections of these areas and requires compliance by facility operators. Westover ARB is also subject to the Oil Pollution Prevention Act which includes specific operation and maintenance requirements, the development of a Spill Prevention, Control, and Countermeasures (SPCC) Plan, and the development of a Facility Response Plan (FRP). These documents are enforced across Westover ARB.	
Responsible Department: Base Civil Engineer	
Measurable Goal and Deadline:	
<input checked="" type="checkbox"/> Develop a written operation and maintenance procedures and an inventory of buildings and facilities where pollutants are exposed to stormwater by 30 June 2022. <i>These procedures are contained in the reports referenced above and are enforced at Westover ARB. These plans also include a written inventory of buildings and facilities where pollutants are exposed to stormwater runoff. This requirement is satisfied.</i>	
Documentation/Location:	
The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.	

BMP 6c: Vehicle and Equipment Storage	MCM: Good housekeeping and Pollution Prevention
Permit Citation: 2016 Final Permit Part 2.3.7.a.ii as modified by Part 1.10.3.a for new permittees.	
Description: Procedures for storage of vehicles and equipment, including an inventory of these areas, are already established at Westover ARB. Because Westover ARB is subject to the EPA MSGP, a site-wide SWPPP has been developed, is constantly updated, and includes good housekeeping and operation and maintenance requirements for areas where equipment is stored. The SWPPP involves frequent inspections of these areas and requires compliance by facility operators. Westover ARB is also subject to the Oil Pollution Prevention Act which includes specific operation and maintenance requirements, the development of a Spill Prevention, Control, and Countermeasures (SPCC) Plan, and the development of a Facility Response Plan (FRP). These documents are enforced across Westover ARB and fulfill all the SWPPP requirements in the MS4 Permit.	
Responsible Department: Base Civil Engineer	
Measurable Goal and Deadline:	
<input checked="" type="checkbox"/> Develop a written operation and maintenance procedures and an inventory of buildings and facilities where pollutants are exposed to stormwater by 30 June 2022. <i>These procedures are contained in the reports referenced above and are enforced at Westover ARB. These plans also include a written inventory of vehicle and equipment storage areas. This requirement is satisfied.</i>	
Documentation/Location:	
The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.	

BMP 6d: Catch Basin Cleaning Program	MCM: Good housekeeping and Pollution Prevention
<p>Permit Citation: 2016 Final Permit Part 2.3.7.a.iii.2 and 4 as modified by Permit Appendix H Part V.2.ii for solids impaired receiving waters.</p> <p>Part 2.3.7.a.iii.2 states: The permittee shall keep a log of catch basins cleaned or inspected. The permittee shall report in each annual report the total number of catch basins, number inspected, number cleaned, and the total volume or mass of material removed from all catch basins.</p>	
<p>Description: Procedures for operation and maintenance of stormwater infrastructure are already established at Westover ARB. This program is documented by NPDES General Permit and enforced by AFMAN32-1067. Westover ARB has a catch basin cleaning program authorized by AFMAN32-1067 and implemented under the BOS contract, Tab F, Real Property Maintenance (F5.25.3). All manholes and catch basins are inspected and evaluated for structural integrity and the presence of debris. All debris, including dirt, leaves, and sediment, are removed at the time of inspection, which occurs on each catch basin and manhole annually. The BOS contractor’s reporting of catch basin cleaning and inspection results will serve as the permit-required “log” stipulated in 2.3.7.a.iii.2.</p> <p>A requirement of the MS4 Permit is the optimization of inspections and cleanings to:</p> <ol style="list-style-type: none"> 1. Prioritize attention on Catch Basin structures in construction zones. At Westover, the construction contractor as overseen by the construction management agency (e.g. Army Corps of Engineers, etc.) is responsible for protecting storm drains from potential pollutants stemming from construction activities. Storm drain protection and any needed corrective action is part of the construction contract specs or scope of work. The MS4-required optimization effort within construction zones is achieved through our project design and construction procedures, which are discussed in further detail earlier in this SWMP in the construction BMP chapter and post-construction BMP chapter. 2. Ensure no catch basin is 50% full of sediments. At Westover, the BOS contractor is tasked with cleaning the catch basins. BOS Contract, Tab F5.25 Storm Drainage states “Annually the KTR shall inspect and document all storm drain catch basins for structural integrity (e.g. loose brick), concrete or catch basin inlets, presence of debris. The KTR shall remove all debris such as leaves, dirt or other sediment at time of inspection. The KTR shall prepare and submit a report of the inspection findings to the BCE.” <p>Disposal of catch basin cleanings is governed by Massachusetts state law and executed by the BOS Contractor in adherence to specific contract terms.</p>	
<p>Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Develop a catch basin cleaning program. <i>This program is in effect at Westover ARB and this requirement is fully satisfied.</i></p>	
<p>Documentation/Location:</p> <p>The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.</p>	

BMP 6e: Stormwater Infrastructure Operation and Maintenance Procedures	MCM: Good housekeeping and Pollution Prevention
<p>Permit Citation: 2016 Final Permit Part 2.3.7.a.iii.1 and 6 as modified by Part 1.10.3.a for new permittees.</p>	
<p>Description: Westover ARB maintains stormwater infrastructure in accordance with AFMAN32-1067. Section 6.2 of AFMAN32-1067 Stormwater Systems Operation and Maintenance Compliance directs BCE to follow relevant guidance in the applicable CE Playbook and to follow the NPDES Permit. Under this permit, Westover ARB has developed a SWPPP that outlines site specific operation and maintenance procedures. These procedures are implemented under the BOS contract Tab F, Real Property Maintenance (F5.25) which requires that the BOS contractor shall inspect and maintain all storm water detention ponds and spill containment ponds monthly to include the following: clean trash from debris catchers and weirs, ensure inlet and outlet weirs are in good repair with water not leaking under concrete, exercise both inlet and outlet valves and leave fully open, clean openings and outlets free of debris, clean trash from all surface weirs and outlet structure overflows, and inspect ponds for silt buildup, erosion, woody vegetation and adequate drive access. Inspections for each pond shall be documented. A written report of findings and description of the O&M service performed shall be provided to Contractor's Officer Representative and Westover Environmental Office within 5 days after the service is completed.</p>	
<p>Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p>Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop a stormwater infrastructure inspection and maintenance program. <i>This program is in effect at Westover ARB and this requirement is fully satisfied.</i></p>	
<p>Documentation/Location: The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.</p>	

BMP 6f: Street and Parking Lot Sweeping Program	MCM: Good housekeeping and Pollution Prevention
<p>Permit Citation: 2016 Final Permit Part 2.3.7.a.iii.3 and 4 as modified by Permit Appendix H Part V.2.a.ii for solids impaired receiving waters.</p> <p>Part 2.3.7.a.iii.3 states: The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential.</p> <p>Permit Appendix H Part V.2.a.ii states: For sweeping, target areas with potential for high pollutant loads. This may include, but is not limited to, increased street sweeping frequency in commercial areas and high density residential areas, or drainage areas with a large amount of impervious area. Prioritize inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full. Clean catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings. Each annual report shall include the street sweeping schedule determined by the permittee to target high pollutant loads.</p>	
<p>Description: Westover ARB has a street and parking lot cleaning program as required by AFMAN32-1067 and implemented through the BOS contract, Tab F, Real Property Maintenance (F6.3.7). Under the BOS contract, the BOS contractor is required to sweep all roads and parking lots once per month. The contractor is required to document areas swept daily throughout the month. Sweeping is required to clean pavement of all dirt, debris, and foreign matter. The BOS contractor prepares a report summarizing these activities and includes inspection results to Westover ARB staff. The BOS contract includes the maintenance or repairs of all pavements (airfield, roads, parking lots, sidewalks and dikes), and airfield pavement sweeping. The contractor (KTR) shall check all Air Force-owned airfield pavements (runway, taxiways, ramps and aprons) daily for FOD and shall sweep 20% of the airfield pavement each day. The KTR shall arrange his daily sweeping so that all airfield pavements are swept no less than once a month. All aircraft parking mooring points and static ground points shall be clean and free of FOD. The KTR shall document each area swept daily throughout the month. The KTR shall sweep all roads and parking lots a minimum of one time per month. The KTR shall document each area swept daily throughout the month. After sweeping, pavements and curbs shall be free of dirt, debris, and foreign matter.</p> <p>As Stoney Brook is impaired for solids, additional permit conditions are required, namely Good Housekeeping BMPs must have higher frequency of street sweepings at high pollutant load areas. Because Westover ARB already employs higher frequencies than what is required by Part 2.3.7, this requirement to increase sweeping at higher pollutant load areas is fulfilled.</p> <p>Disposal of catch basin cleanings is governed by Massachusetts state law and executed by the BOS Contractor in adherence to specific contract terms.</p>	
<p>Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Develop a street and parking lot sweeping program. <i>This program is in effect at Westover ARB and this requirement is fully satisfied.</i></p>	
<p>Documentation/Location:</p> <p>The latest version of AFMAN32-1067 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.7.</p>	

BMP 6g: Snow Plan / Winter Road Maintenance	MCM: Good housekeeping and Pollution Prevention
Permit Citation: 2016 Final Permit Part 2.3.7.a.iii.5.	
Description: Westover ARB has a winter road maintenance program as required by AFI32-1001 Civil Engineer Operations, documented by the Westover ARB Snow Plan, and implemented under BOS contract, Tab F, Real Property Maintenance (F6.3.5). The specific policies, procedures, and responsibilities for the Winter Road Maintenance Program are contained in the Snow Plan.	
Responsible Department: Monitored by the Base Civil Engineer and implemented by the BOS contractor.	
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop a winter road maintenance program. <i>This program is in effect at Westover ARB and this requirement is fully satisfied.</i>	
Documentation/Location: The latest version of AFI32-1001 is located at the following web address: https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1001/afi32-1001.pdf The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.5. The Westover ARB Snow Plan is maintained by the Base Civil Engineer and is available for public review upon request.	

BMP 6h: Stormwater Pollution Prevention Plan	MCM: Good housekeeping and Pollution Prevention
Permit Citation: 2016 Final Permit Part 2.3.7.b stipulates the following: “The SWPPP is a separate and different document from the SWMP required in part 1.10. A SWPPP does not need to be developed for a facility if the permittee has either developed a SWPPP or received a no exposure certification for the discharge under the Multi-Sector General Permit or the discharge is authorized under another NPDES permit.”	
Description: Westover ARB as a whole is subject to the EPA MSGP and therefore maintains and annually updates a SWPPP.	
Responsible Department: Base Environmental Office (439 MS/CEV)	
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop a SWPPP by 30 June 2022. <i>A SWPPP has been completed as required by the MSGP and is in full effect site-wide.</i>	
Documentation/Location: The latest version of the SWPPP is maintained by the Base Environmental Office and is available for public review upon request.	

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5. ADDITIONAL REQUIREMENTS

5.1 NITROGEN TMDL REQUIREMENTS (PERMIT APPENDIX F)

All eight Westover ARB outfalls discharge into tributaries of the Connecticut River which discharges to the Long Island Sound. Therefore, the MS4 discharges are subject to the **Long Island Sound TMDL for Total Nitrogen**. Requirements imposed on Westover ARB by the TMDL are listed in the 2016 Final Permit Appendix F Part B.I. This section describes these requirements and how they are addressed at Westover ARB.

Enhanced Public Education and Outreach BMP (Permit Appendix F Part B.I.1.a.i.1) – The permit stipulates a requirement to craft specific annual messages regarding grass clippings, slow release fertilizer, pet waste, and leaf litter to certain audiences, however additional messages are not warranted for Westover. This determination is discussed in Section 4.1.2 of this SWMP.

Enhanced Stormwater Management in New Development BMP (Permit Appendix F Part B.I.1.a.i.2) – The permittee is required to implement BMPs optimized for nitrogen removal and the retrofit opportunities and priority ranking under Part 2.3.6.1.b shall include consider of BMPs to reduce nitrogen discharges. These requirements are discussed in more detail in Section 4.5.2 and 4.5.3. BMP 5b Post Construction Stormwater Management and BMP 5c List of Retrofit Opportunities are used to fulfill these requirements.

Enhanced Good House Keeping and Pollution Prevention BMP (Permit Appendix F Part B.I.1.a.i.3) – The permittee is required to establish requirements regarding the use of slow release fertilizer, management of grass cuttings and leaf litter, and increased street sweeping frequencies. These requirements are discussed in more detail in Section 4.6.2 and 4.6.3.

BMP 6a Parks and Open Spaces and BMP 6f Street and Parking Lot Sweeping Program are used to fulfill these requirements.

Nitrogen Source Identification Report (Permit Appendix F Part B.I.1.b) – Within four years of the permit effective date, the permittee shall complete a Nitrogen Source Identification Report – BMP 7a. The report shall include a calculation of total urbanized area; screening and monitoring results; identification, delineation, and prioritization of potential catchments with high nitrogen loading; and identification of potential retrofit opportunities for the installation of structural BMPs during re-development. The main sources of nitrogen include atmospheric precipitation, geological sources, fertilizer application, agricultural land, livestock, poultry, and urban waste (Ghaley and Ramakrishnan 2015). No agricultural, livestock, or poultry operations are conducted at Westover ARB. **Fertilizer use** is generally discouraged by the Integrated Natural Resources Management Plan. Typically, fertilizers are only used in the following areas: Ellipse and Monuemnt, Facility 1850, and two Ballfields. It is not believed that Westover ARB is a large contributor of nitrogen to its receiving waters. However, in accordance with the 2016 Final Permit, BMP 7a is the development of the Nitrogen Source Identification Report. The information gathered as part of this report will be used to locate and design BMP 7d Demonstration Structural BMP Installation.

(Permit Appendix F) BMP 7a: Nitrogen Source Identification Report
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.b for Nitrogen TMDL Requirements.
Description: The report will include a calculation of total urbanized area; screening and monitoring results; identification, delineation, and prioritization of potential catchments with high nitrogen loading; and identification of potential retrofit opportunities for the installation of structural BMPs during re-development.
Responsible Department: Base Environmental Office (439 MS/CEV)
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop the Nitrogen Source Identification Report by 30 June 2022 and submit with the 4 th Annual Report. <i>This is complete, the Nitrogen Source Identification Report is in Appendix L of the SWMP. Outfalls 1 and 3 were identified as catchments with higher potential for nitrogen loading to be considered in the planned BMP evaluation.</i>
Documentation/Location: The list will be attached to this plan (SWMP Appendix L) and to the 4 th Annual Report.

Structural BMP Evaluation (Permit Appendix F Part B.I.1.c.i) – The permittee shall evaluate all properties identified by the retrofit opportunities (See Section 4.5.3; BMP 5c) for structural BMP installation. The evaluation shall include planned redevelopment activity and date planned for the property if applicable; the estimate cost for redevelopment or retrofit BMPs; and the engineering and regulatory feasibility of redevelopment or retrofit BMPs. BMP 7b is the development of the Structural BMP Evaluation.

(Permit Appendix F) BMP 7b: Planned Structural BMPs Evaluation
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.c.i for Nitrogen TMDL Requirements.
Description: The properties identified by BMP 5e (retrofit opportunities) will be evaluated for the feasibility of the installation of structural BMPs. The evaluation will include planned redevelopment activity and date planned for the property; the estimate cost for redevelopment or retrofit structural BMPs; and the engineering and regulatory feasibility of redevelopment or retrofit structural BMPs.
Responsible Department: Base Environmental Office (439 MS/CEV)
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Develop the Structural BMPs Evaluation by 30 June 2023 and submit with the 5 th Annual Report. <i>This is complete and included in Appendix M.</i>
Documentation/Location: The list will be attached to this plan (SWMP Appendix M) and to the 5 th Annual Report.

Planned Structural BMPs (Permit Appendix F Part B.I.1.c.ii) – The permittee shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the 5th Annual Report. One of these structural BMPs shall be installed as a demonstration project within six years of the effective permit, targeting a catchment with high nitrogen load potential. The demonstration project will be located and designed using the nitrogen sampling and other information collected as part of the Nitrogen Source Identification Report (BMP 7a). If the Nitrogen Source Identification Report fails to find a significant source of Nitrogen at Westover ARB, it is proposed that the required demonstration project be eliminated. The remaining structural BMPs shall be

installed in accordance with the plan and schedule. BMPs 7c and 7d are used to fulfil these requirements.

(Permit Appendix F) BMP 7c: Planned Structural BMPs
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.c.ii for Nitrogen TMDL Requirements.
Description: Develop a listing of planned structural BMPs and a plan and schedule for implementation in the 5 th Annual Report.
Responsible Department: Base Environmental Office (439 MS/CEV)
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Develop the listing of Planned Structural BMPs by 30 June 2023 and submit with the 5th Annual Report. <i>This is complete and included in Appendix N. The permittee shall plan and install a minimum of one structural BMP as a demonstration project within six years of the permit effective date. The demonstration project shall be installed targeting a catchment with high nitrogen load potential. The permittee shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the year 5 annual report.</i></p> <p><i>Committing government funds to carry out any projects outlined in the plan is not authorized without proper PPBE (planning, programming, budgeting, and execution) procedure, at a minimum:</i></p> <ul style="list-style-type: none"> - <i>Air Force Form 9 Planning Document</i> - <i>Coordination with CE leadership and Finance Department.</i>
<p>Documentation/Location:</p> <p>The list will be attached to this plan (SWMP Appendix N) and to the 5th Annual Report.</p>

(Permit Appendix F) BMP 7d: Demonstration Structural BMP Installation
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.c.ii for Nitrogen TMDL Requirements.
Description: Installation of a structural BMP as a demonstration project targeting a high nitrogen load potential watershed. The BMP will be located and designed using the information collected as part of the Nitrogen Source Identification Report (BMP 7a). If the Nitrogen Source Identification Report fails to find a significant source of Nitrogen at Westover ARB, it is proposed that the required demonstration project be eliminated.
Responsible Department: Base Environmental Office (439 MS/CEV)
<p>Measurable Goal and Deadline:</p> <p><input checked="" type="checkbox"/> Install the demonstration project by 30 June 2024. <i>This project has been completed and is described in Appendix N, and other opportunities are on tentative schedules.</i></p>
<p>Documentation/Location:</p> <p>The project will be summarized in this report and the 6th Annual Report.</p>

Structural BMP Tracking (Permit Appendix F Part B.I.1.c.iii) – The permittee shall track any structural BMPs listed in Appendix H Attachment 1 of the 2016 Final Permit. These BMPs include infiltration trenches, infiltration basins or other surface infiltration practices, bioretention practices, gravel wetland systems, porous pavement, wet ponds or wet detention basins, dry ponds or

detention basins, and water quality swales. The nitrogen removal of each BMP shall be estimated consistent with Permit Appendix H Attachment 1. The permittee shall also document the BMP type, total area treated by the BMP, the design storage volume of the BMP, and the estimate nitrogen removal in mass per year in each annual report. BMPs 7e is used to fulfil these requirements.

(Permit Appendix H) BMP 7e: Structural BMP Tracking
Permit Citation: 2016 Final Permit Appendix F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Permit Appendix H Attachment 1.
Description: Westover ARB will track infiltration trenches, infiltration basins or other surface infiltration practices, bioretention practices, gravel wetland systems, porous pavement, wet ponds or wet detention basins, dry ponds or detention basins, and water quality swales installed within the MS4 watershed. Documentation will include the following information at a minimum: BMP type, total area treated by the BMP, the design storage volume of the BMP, and the estimated nitrogen removal in mass per year .
Responsible Department: Base Environmental Office (439 MS/CEV)
Measurable Goal and Deadline: <input checked="" type="checkbox"/> Track the listed BMPs in each Annual Report. Per Permit Part 1.10.3, deadlines in Permit Appendix H are extended by two (2) years. The tracking must be completed in 2020 and then updated annually thereafter. <i>Tracking is complete and is included in SWMP Appendix O.</i>
Documentation/Location: The BMP Tracking and Nitrogen Calculations is attached to this plan (SWMP Appendix O) and to the appropriate Annual Reports.

5.2 BACTERIA IMPAIRMENT REQUIREMENTS (PERMIT APPENDIX H)

Westover ARB's Outfalls 004 and 011 discharges into Willimansett Brook (MA34-60) and Stoney Brook (MA34-19), respectively which are both impaired for bacteria. Therefore, Outfall 004 and 011 is subject to the requirements listed in Appendix H Part III of the 2016 Final Permit. This section describes these requirements and how they are addressed at Westover ARB.

Enhanced Public Education and Outreach BMP (Permit Appendix H Part III.2.a.i) – The permittee is required to craft specific annual messages regarding pet wastes and septic system maintenance and operations. **It has been determined that these messages are not applicable** to Westover ARB. Discussion on this determination is contained in Section 4.1.2.

Enhanced IDDE Program (Permit Appendix H Part III.2.a.ii) – The permittee shall designate any outfall discharging to bacteria impaired waters as problem or high-priority outfalls under the IDDE Program. This is discussed in more detail in Section 4.3.4 of this SWMP. This requirement is fulfilled by BMP 3b (IDDE Program).

5.3 SOLIDS IMPAIRMENT REQUIREMENTS – PER PERMIT APPENDIX H

Westover ARB's Outfall 011 discharges into Stoney Brook (MA34-19) which is impaired for solids. Therefore, Outfall 011 is subject to the requirements listed in Appendix H Part V of the 2016 Final Permit. This section describes these requirements and how they are addressed at Westover ARB.

Enhanced Stormwater Management in New Development BMP (Permit Appendix H Part V.2.a.i) – The permittee must require new or redeveloped stormwater management systems to incorporate designs that allow for shutdown and containment to isolate the system in the event of an emergency or unexpected event. This requirement is met at Westover ARB under the Oil Pollution Control

Act compliance and SPCC Plan. Additionally, infiltration is also encouraged by the 2016 Final Permit.

Enhanced Good House Keeping and Pollution Prevention BMP (Permit Appendix H Part V.2.a.ii)

– The permittee is required to increase the street sweeping frequency and enhanced catch basin inspections in areas with potential for high pollutant loads. Because Westover ARB already employs increased frequencies for these activities, this requirement is fulfilled. This is discussed in more detail in Section 4.6.2 and 4.6.3 of this SWMP. These requirements are fulfilled by BMP 6d and 6f which includes the Catch Basin Cleaning Program and the Street and Parking Lot Sweeping Program.

5.4 DISCHARGES TO SURFACE DRINKING WATER SUPPLIES AND THEIR TRIBUTARIES

All Westover ARB outfalls discharge to tributaries of the Connecticut River which is a Class B surface water under 314 CMR 4.06. Accordingly, the permittee is required to provide pretreatment and spill control measures to stormwater discharges to the extent feasible. Pretreatment requirements for new development and redevelopments are built into the stormwater management standards required by BMP 5a. Existing treatment structures are managed in accordance with AFIs and the site's SWPPP. Additionally, spill control is provided across the site in accordance with the Oil Pollution Act and Westover ARB's SPCC Plan.

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6. EVALUATION AND ASSESSMENT

This section describes the procedures for evaluation and assessment of the SWMP implementation and effectiveness against measurable goals.

6.1 PROGRAM EVALUATION AND ANNUAL REPORT

Westover ARB will self-evaluate its compliance with the terms and conditions of the 2016 Final Permit. These self-evaluations will be submitted with the Annual Reports. The Annual Reports will also be attached to the SWMP.

If, upon self-evaluation, BMPs discussed in the SWMP are found to be ineffective in achieving the objectives of each control measure and the defined measurable goals, the BMPs will be updated as necessary. All BMP modifications will be explained in the Annual Reports.

Westover ARB will submit an Annual Report for each permit year summarizing the reporting year commencing on the permit effective date. The first Annual Report will commence 1 May of the year prior to end of the first year of permit coverage. The Annual Reports will be submitted within 90 days of the close of each reporting period.

Each annual report will include the following, at a minimum:

- Self-assessment review of compliance with permit terms and conditions.
- Assessment of appropriateness of selected BMPs.
- Status of any plans or activities required due to discharges to receiving waters with an approved TMDL or water quality limited waters.
- Assessment of progress towards measurable goals and objectives of each MCM.
- Outfall screening and monitoring data.
- Activities for next reporting cycle.
- Changes to BMPs or measurable goals.
- Activities undertaking to achieve any measure goal or implementing any MCM.

Annual Reports will be submitted to the following addresses:

United States Environmental Protection Agency
Stormwater and Construction Permits Section (OEP06-1)
Five Post Office Square, Suite 100
Boston, Massachusetts 02109

and

Massachusetts Department of Environmental Protection
One Winter Street – 5th Floor
Boston, Massachusetts 02108
Attn: Frederick Civian

Or may be submitted electronically to: stormwater.reports@epa.gov

After 21 December 2020, all Annual Reports must be submitted electronically.

6.2 RECORD KEEPING

All records required by this permit will be retained for at least 5 years. Examples of required records include information used in the development of any written program required by the permit, monitoring results, copies of reports, records of screenings, follow-up and elimination of illicit discharges, maintenance records, inspection records, SWMP, SWPPP, and annual reports. This list is not all inclusive. All records will be made available to the public by the Base Environmental Office upon request.

7. REFERENCES

- Air Force Civil Engineer Center. 2014. *Engineering Technical Letter 14-1: Construction and Operation and Maintenance Guidance for Storm Water Systems*. 7 August.
- Air Force Reserve Command. 2016. Integrated Natural Resources Plan, Westover Air Reserve Base, Massachusetts. 15 August.
- Department of the Air Force. 2015. *Air Force Instruction 32-1002 Snow and Ice Control*. 22 January.
- Department of the Air Force. 2015. *Air Force Instruction 32-1023 Designing and Constructing Military Construction Projects*. 19 November.
- Department of the Air Force. 2015. *Air Force Instruction 32-1067 Water and Fuel Systems*. 4 February.
- Ghaley, A.E. and V.V Ramakrishnan. 2015. *Nitrogen Sources and Cycling in the Ecosystem and its Role in Air, Water and Soil Pollution: A Critical Review*. Dalhousie University, Halifax, Nova Scotia, Canada. 27 February.
- Naval Facility Engineering Command. 2015. *UFC 3-210-10 Low Impact Development*. 1 June.
- Naval Facility Engineering Command. 2016. *UFC 3-250-01 Pavement Design for Roads and Parking Areas*. 14 November.
- U.S. Department of Commerce. 2000. *Urbanized Area Outline Map (Census 2000) Springfield, MA--CT*.
- U.S. Environmental Protection Agency. 2012. *NPDES Phase II Stormwater Program Automatically Designated MS4 Areas*. 19 November.
- U.S. Forest Service. 2015. Vegetation Management Plan, Westover Air Reserve Base, Massachusetts. February.

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Appendix A

Authorized Representative

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Appendix B

2016 Final MS4 Permit

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Appendix C

Notice of Intent and Authorization to Discharge Letter

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Appendix D
SWMP Checklist

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Appendix E

Endangered Species Documentation

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Appendix F

Public Education Messages

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Appendix G

Sanitary Sewer Overflow Inventory

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Appendix H

Mapping of MS4 System

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Appendix I
IDDE Program

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Appendix J

IDDE Program Training

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Appendix K

List of Retrofit Opportunities

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Appendix L

Nitrogen Source Identification Report

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Appendix M

Structural BMP Evaluation

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Appendix N

Planned Structural BMPs

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Appendix O

BMP Tracking for Nitrogen Removal

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Appendix P
Annual Reports

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Appendix Q

Stormwater Design Policy

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