



**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 <sup>3</sup>
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.

9/28/2022

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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"> <li>• Section 3 - Added E.coli impairment of Willimansett Brook;</li> <li>• Section 3.1.1 – Added text to indicate that Outfall 004 discharges to an impaired waterway;</li> <li>• Section 4 - Updated formatting throughout;</li> <li>• Section 4.1.2 - Clarified target audiences justification based on base determinations;</li> <li>• Section 4.1.3 - Edited BMP 1a per base determination on target audiences and revised deadline and BMP details;</li> <li>• Section 4.1.3 - Added documentation of public education message to BMP 1a;</li> <li>• Section 4.1.3 – Deleted refences and text from former BMPs no longer included;</li> <li>• Section 4.2.2 - Revised BMP 2a to indicate 2019 SWMP and Annual Report were completed;</li> <li>• Section 4.2.2 - Revised BMP 2b per base procedures;</li> <li>• 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;</li> <li>• 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;</li> <li>• Section 4.3.3 – Revised BMP 3e for clarification and updated clarification from EPA;</li> <li>• Section 4.4.3 – Revised description for BMP 4a;</li> <li>• Section 4.4.3 – Revised title and permit citation of BMP 4b;</li> <li>• Section 4.4.3 – Revised title, permit citation, and description for BMP 4c;</li> <li>• Section 4.5 – Revised title;</li> <li>• Section 4.5.3 – Revised title and description of BMP 5a;</li> <li>• Section 4.5.3 – Revised permit citation and deadline for BMP 5c;</li> <li>• Section 4.6.3 – Revised title, permit citation, and/or measurable goals for BMP 6a to 6h;</li> <li>• Section 5 – Revised formatting and text for clarification;</li> <li>• Section 5.1 – Revised title of BMP 7b;</li> <li>• Section 5.1 – Added documentation to BMP 7e Structural BMP Tracking;</li> <li>• Appendix F – Populated with public education messages</li> <li>• Appendix O – Populated with Structural BMP Tracking sheets</li> <li>• Appendix P – Populated with 1<sup>st</sup> annual report</li> </ul>	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"> <li>• Section 2.2 – Added revision to Final Permit Description</li> <li>• Section 4.3.2 – Added Air Force Manuals</li> <li>• Section 4.3.3 – Revised BMP 3a description and documentation</li> <li>• Section 4.4.3 – Revised BMP 4a description and documentation</li> <li>• Section 4.4.3 – Revised BMP 4b description and documentation</li> <li>• Section 4.4.3 – Revised BMP 4c description references</li> <li>• Section 4.5.3 – Revised BMP 5a description and documentation</li> <li>• Section 4.5.3 – Updated BMP 5b to reflect completion of goals, added comparison table for stormwater requirements</li> <li>• Section 4.5.3 – Revised BMP 5c references</li> <li>• Section 4.6.3 – Revised BMP 6d description to update document references</li> <li>• Section 4.6.3 – Revised BMP 6e description to update document references</li> <li>• Section 4.6.3 – Revised BMP 6f description to update document references</li> <li>• Section 4.6.3 – Revised BMP 6g description to update document references</li> <li>• Added Appendix Q with Stormwater Policy</li> </ul>	<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"> <li>• Added Appendix I with Written IDDE Plan</li> <li>• Added Appendix L with Nitrogen Source Report</li> <li>• Edited text in Section 4.1.3 to better describe base activities</li> <li>• 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</li> </ul>	<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		
Revision 5		
Revision 6		
Revision 7		
Revision 8		
Revision 9		
Revision 10		

## 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	<a href="mailto:champanine.saviengvong@us.af.mil">champanine.saviengvong@us.af.mil</a>
John B. Moriarty	Flight Chief	Base Environmental Office (439 MS/CEV)	413-557-2434	<a href="mailto:john.moriarty.1@us.af.mil">john.moriarty.1@us.af.mil</a>
John Cody	Environmental Engineer	Base Environmental Office (439 MS/CEV)	413-557-3036	<a href="mailto:john.cody.9@us.af.mil">john.cody.9@us.af.mil</a>

## 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**

<b>Outfall ID</b>	<b>Receiving Water</b>	<b>Impairments</b>
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 is 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

<b>BMP 1a: Industrial Users (including Employees, Tenants, and Contractors)</b>	<b>MCM: Public Education Message</b>
<b>Permit Citation:</b> 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><b>Description:</b> 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"> <li>• auto repair, auto washing</li> <li>• 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)</li> <li>• storage of potential pollution-generating materials (emphasize pollution prevention)</li> <li>• management of waste materials and dumpsters (cover and pollution prevention)</li> <li>• management of parking lot surfaces (sweeping)</li> </ul> <p>The Base continues to and does not plan to halt carrying out the following:</p> <ul style="list-style-type: none"> <li>• Quarterly Cross Functional Team meetings to disseminate information to (shop) supervisors regarding storm water pollution prevention, spills response, and waste management.</li> <li>• Pre-Construction meetings to disseminate information on environmental requirements.</li> <li>• Facility Manager Training and MXG Block Training to disseminate information on environmental compliance.</li> </ul>	
<b>Targeted Audience:</b> Base organizations that engage in the Industrial activities as listed in MS4 Permit Section 2.3.2.d	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<p><b>Measurable Goal and Deadline:</b></p> <p><input checked="" type="checkbox"/> Distribute one message within the 6-yr term of 2017-2023.</p>	
<p><b>Documentation:</b> Westover ARB delivered the following messages to complete this BMP:</p> <ul style="list-style-type: none"> <li>• Face-to-face training of Marine Vehicle Repair Shop in October and November 2019 on Spill Prevention and Response;</li> <li>• Stormwater training for Aircraft Maintenance Group on 6 and 9 February 2020 (see slideshow in SWMP Appendix F); and</li> <li>• Posted Environmental Management System Posters throughout base on stormwater and pollution prevention topics (see example poster in SWMP Appendix F).</li> </ul>	

## 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

<b>BMP 2a: Public Review of SWMP and Annual Reports</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.3.
<b>Description:</b> The Base Environmental Office (439 MS/CEV) will post the SWMP and Annual Reports to the Westover ARB's Environmental and Noise webpage.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <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 type="checkbox"/> Post 2021 SWMP and Annual Report once finalized <input type="checkbox"/> Post 2022 SWMP and Annual Report once finalized <input type="checkbox"/> Post 2023 SWMP and Annual Report once finalized
<b>Documentation/Location:</b> The SWMP and Annual Reports will be posted at <a href="https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/">https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/</a>
<b>BMP 2b: Public Participation in SWMP Development</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.3.
<b>Description:</b> 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.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Solicit comments from the public on the SWMP
<b>Documentation/Location:</b> The SWMP will be posted at the following address and will include a contact email or phone number for delivering comments. <a href="https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/">https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/</a>

## 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

<b>BMP 3a: Authority</b>	<b>MCM: IDDE</b>
<b>Permit Citation:</b> 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.	
<b>Description:</b> 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.	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goal and Deadline:</b> <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>	
<b>Documentation/Location:</b> The latest version of AFMAN32-1067 is located at the following web address: <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</a>	

<b>BMP 3b: IDDE Program &amp; Written Plan</b>	<b>MCM: IDDE</b>
<p><b>Permit Citation:</b> 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><b>Description:</b> 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><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>	
<p><b>Measurable Goals and Deadlines:</b></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Develop IDDE Program written procedures by <b>30 June 2022</b>. <i>This has been completed. The written IDDE Program is in Appendix I of the SWMP.</i></li> <li><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></li> <li><input type="checkbox"/> Conduct Dry Weather Screening and Sampling by <b>30 June 2024</b>. <i>Continue performing Dry Weather Screening and, if applicable, Sampling every 5 years.</i></li> <li><input checked="" type="checkbox"/> Begin Catchment Investigations of all problem outfalls by 30 June 2023. <i>Not currently applicable to Westover ARB because no “problem” outfall has been identified during the initial ranking.</i></li> <li><input type="checkbox"/> Complete Catchment Investigations of Problem Outfalls by 30 June 2028. <i>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.</i></li> <li><input type="checkbox"/> Begin Catchment Investigations on High and Low Priority Outfalls after rankings are updated based on Dry Weather Screening and Sampling.</li> <li><input type="checkbox"/> Complete Catchment Investigations of High and Low Priority Outfalls by <b>30 June 2031</b>.</li> <li><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.</li> </ul>	
<p><b>Documentation/Location:</b> 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>	

<b>BMP 3c: Sanitary Sewer Overflow Inventory</b>	<b>MCM: IDDE</b>
<b>Permit Citation:</b> 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	
<b>Description:</b> 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).	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<b>Measurable Goal and Deadline:</b>	
<b>Measurable Goals and Deadlines:</b>	
<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.	
<b>Documentation/Location:</b> The latest inventory is attached to this plan as Appendix G and will be attached to each annual report.	

<b>BMP 3d: Mapping of MS4 System (Phase I and Phase II)</b>	<b>MCM: IDDE</b>
<b>Permit Citation:</b> 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.	
<b>Phase I Description:</b> 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.	
<b>Phase II Description:</b> 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.	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<b>Measurable Goals and Deadlines:</b>	
<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.	
<b>Documentation/Location:</b> The latest map is attached to this plan as Appendix H and will be attached to each annual report.	

<b>BMP 3e: Employee Training</b>	<b>MCM: IDDE</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.4.11 as modified by Part 1.10.3.a for new permittees.	
<b>Description:</b> The Base Environmental Office (439 MS/CEV) will perform IDDE program training, including how to recognize illicit discharges and SSOs.	
<b>Targeted Audience:</b> Employees with IDDE Program responsibilities.	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Perform annual training to all applicable employees annually the year following completion of the IDDE Program written procedures are complete (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 during permit year 1 July 2022 to 30 June 2023.	
<b>Documentation:</b> The training will be 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

<b>BMP 4a: Construction Site Stormwater Authority</b>	<b>MCM: Construction Sites</b>
<p><b>Permit Citation:</b> 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><b>Description:</b> 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><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b></p> <p><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><b>Documentation/Location:</b></p> <p>The latest version of AFMAN32-1067 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</a></p> <p>The latest version of NPDES General Construction Permit is located at the following web address:  <a href="https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents">https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents</a></p>	

<b>BMP 4b: Written Procedures for Site Plan Review, Inspections, and Enforcement of Sediment and Erosion Control Measures</b>	<b>MCM: Construction Sites</b>
<p><b>Permit Citation:</b> 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><b>Description:</b> 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><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goals and Deadlines:</b></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><b>Documentation/Location:</b></p> <p><b>Additional details on the procedure for inspections can be found after this block.</b></p> <p>The latest version of NPDES General Construction Permit is located at the following web address:  <a href="https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents">https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents</a></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**

<b>BMP 5a: Post Construction Stormwater Management Authority</b>	<b>MCM: POST Construction Stormwater Management</b>
<b>Permit Citation:</b> 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><b>Description:</b> 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&amp;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>	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goal and Deadline:</b>	

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

<b>BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more</b>	<b>MCM: POST Construction Stormwater Management</b>
<p><b>Permit Citation:</b></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><b>Description:</b> The Base’s design requirements must be <b>at least as stringent</b> 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"> <li><input checked="" type="checkbox"/> Address nitrogen removal BMP requirements of Permit Appendix F Part B.I.1.a.i.2</li> <li><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.</li> <li><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”.</li> </ul> <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>	

<b>BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more</b>	<b>MCM: POST Construction Stormwater Management</b>
<p>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><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b>  <input checked="" type="checkbox"/> Develop a written policy by 30 June 2021.</p>	
<p><b>Documentation/Location:</b>  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:  <a href="https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act">https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act</a>  EPA’s EISA guidance document can be found at the following website:  <a href="https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf</a></p>	
<b>BMP 5c: Written Procedures for As-built Drawing Submittals &amp; Long Term O&amp;M (For sites that disturb 1 acre or more)</b>	<b>MCM: POST Construction Stormwater Management</b>
<p><b>Permit Citation:</b>  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><b>Description:</b>  The Base will implement a program for:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Submission of as-built drawings no later than two (2) years after completion of construction projects</li> <li>• 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.</li> <li><input checked="" type="checkbox"/> Long-term operation and maintenance of stormwater management structures</li> <li>• Written procedures for long-term O&amp;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.</li> </ul>	
<p><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b>  <input checked="" type="checkbox"/> Develop a written procedure by 30 June 2021. BOS contract execution of stormwater treatment structure O&amp;M and AFI 32-1023 are both already in effect.</p>	
<p><b>Documentation/Location:</b></p>	

<b>BMP 5c: Written Procedures for As-built Drawing Submittals &amp; Long Term O&amp;M (For sites that disturb 1 acre or more)</b>	<b>MCM: POST Construction Stormwater Management</b>
<p>The latest version of AFI32-1023 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf</a></p> <p>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.</p>	

<b>BMP 5d: Report Assessing Street Design and Parking Lot Guidelines</b>	<b>MCM: Post Construction Stormwater Management</b>
<p><b>Permit Citation:</b> 2016 Final Permit Part 2.3.6.b as modified by Part 1.10.3.a for new permittees.</p>	
<p><b>Description:</b> 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.</p>	
<p><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>	
<p><b>Measurable Goals and Deadlines:</b></p> <p><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></p>	
<p><b>Documentation/Location:</b></p> <p>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:</p> <p><a href="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-3-250-01</a>  <a href="https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10">https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10</a></p>	

<b>BMP 5e: List of Retrofit Opportunities</b>	<b>MCM: Post Construction Stormwater Management</b>
<p><b>Permit Citation:</b> 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.</p>	
<p><b>Description:</b> 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.</p> <p>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.</p>	
<p><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>	
<p><b>Measurable Goal and Deadline:</b></p>	

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 <sup>th</sup> 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.

<b>Massachusetts Stormwater Handbook Standards</b>	<b>Unified Facilities Criteria (UFC) for Low Impact Development</b>
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><b>Permit Citation:</b> 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><b>Description:</b> 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><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the Base Operations Support (BOS) contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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><b>Documentation/Location:</b></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>	

<b>BMP 6b: Buildings and Facilities</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.ii as modified by Part 1.10.3.a for new permittees.	
<b>Description:</b> 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.	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goal and Deadline:</b>	
<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>	
<b>Documentation/Location:</b>	
The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.	

<b>BMP 6c: Vehicle and Equipment Storage</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.ii as modified by Part 1.10.3.a for new permittees.	
<b>Description:</b> 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.	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goal and Deadline:</b>	
<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>	
<b>Documentation/Location:</b>	
The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.	

<b>BMP 6d: Catch Basin Cleaning Program</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<p><b>Permit Citation:</b> 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><b>Description:</b> 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"> <li>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.</li> <li>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.”</li> </ol> <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><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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><b>Documentation/Location:</b></p> <p>The latest version of AFMAN32-1067 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</a></p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.</p>	

<b>BMP 6e: Stormwater Infrastructure Operation and Maintenance Procedures</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.iii.1 and 6 as modified by Part 1.10.3.a for new permittees.	
<b>Description:</b> 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.	
<b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.	
<b>Measurable Goal and Deadline:</b> <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>	
<b>Documentation/Location:</b> The latest version of AFMAN32-1067 is located at the following web address: <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</a> The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.	

<b>BMP 6f: Street and Parking Lot Sweeping Program</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<p><b>Permit Citation:</b> 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 <b>pollutant load</b> reduction potential.</p> <p>Permit Appendix H Part V.2.a.ii states: For sweeping, target areas with potential for <b>high pollutant loads</b>. 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><b>Description:</b> 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><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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><b>Documentation/Location:</b></p> <p>The latest version of AFMAN32-1067 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afman32-1067/afman32-1067.pdf</a></p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.7.</p>	

<b>BMP 6g: Snow Plan / Winter Road Maintenance</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.iii.5.	
<b>Description:</b> 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.	
<b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.	
<b>Measurable Goal and Deadline:</b> <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>	
<b>Documentation/Location:</b> The latest version of AFI32-1001 is located at the following web address: <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1001/afi32-1001.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1001/afi32-1001.pdf</a> 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.	

<b>BMP 6h: Stormwater Pollution Prevention Plan</b>	<b>MCM: Good housekeeping and Pollution Prevention</b>
<b>Permit Citation:</b> 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.”	
<b>Description:</b> Westover ARB as a whole is subject to the EPA MSGP and therefore maintains and annually updates a SWPPP.	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<b>Measurable Goal and Deadline:</b> <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>	
<b>Documentation/Location:</b> The latest version of the SWPPP is maintained by the Base Environmental Office and is available for public review upon request.	

## 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, therefore **should not be a major source** at Westover ARB. Generally, it is unlikely 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.

<b>(Permit Appendix F) BMP 7a: Nitrogen Source Identification Report</b>
<b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.b for Nitrogen TMDL Requirements.
<b>Description:</b> 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.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input checked="" type="checkbox"/> Develop the Nitrogen Source Identification Report by 30 June 2022 and submit with the 4 <sup>th</sup> 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>
<b>Documentation/Location:</b> The list will be attached to this plan (SWMP Appendix L) and to the 4 <sup>th</sup> 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; 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.

<b>(Permit Appendix F) BMP 7b: Planned Structural BMPs Evaluation</b>
<b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.c.i for Nitrogen TMDL Requirements.
<b>Description:</b> The properties identified by BMP 5c (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.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Develop the Structural BMPs Evaluation by 30 June 2023 and submit with the 5 <sup>th</sup> Annual Report.
<b>Documentation/Location:</b> The list will be attached to this plan (SWMP Appendix M) and to the 5 <sup>th</sup> 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 5<sup>th</sup> 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.

<b>(Permit Appendix F) BMP 7c: Planned Structural BMPs</b>
<b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.c.ii for Nitrogen TMDL Requirements.
<b>Description:</b> Develop a listing of planned structural BMPs and a plan and schedule for implementation in the 5 <sup>th</sup> Annual Report.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Develop the listing of Planned Structural BMPs by 30 June 2023 and submit with the 5 <sup>th</sup> Annual Report.
<b>Documentation/Location:</b> The list will be attached to this plan (SWMP Appendix N) and to the 5 <sup>th</sup> Annual Report.

<b>(Permit Appendix F) BMP 7d: Demonstration Structural BMP Installation</b>
<b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.c.ii for Nitrogen TMDL Requirements.
<b>Description:</b> 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.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Install the demonstration project by 30 June 2024.
<b>Documentation/Location:</b> The project will be summarized in this report and the 6 <sup>th</sup> Annual Report.

*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.

<b>(Permit Appendix H) BMP 7e: Structural BMP Tracking</b>
<b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Permit Appendix H Attachment 1.
<b>Description:</b> 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 <b>mass per year</b> .
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <input 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.
<b>Documentation/Location:</b> 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 T
- MDL 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 – 5<sup>th</sup> Floor  
Boston, Massachusetts 02108  
Attn: Frederick Civian

Or may be submitted electronically to: [stormwater.reports@epa.gov](mailto: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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**Authorized Representative**

In accordance with the EPA NPDES 2016 General Permit for Stormwater Discharges from Small Municipal Separate Storm Water Sewer Systems in Massachusetts (2016 Final Permit), Appendix B.11 Part B, all reports, including 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 Appendix B, Subsection 11.A 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 SWMP. A copy must be submitted to EPA, if requested.

As the Base Commander of Westover ARB, I meet the requirements of Appendix B, Subsection 11.A as the senior executive officer having responsibility for the overall operations of a principal geographic unit of the Air Force Reserve Command. This form serves as written authorization for the Westover Air Reserve Base Environmental Engineering Chief and/or Water Quality Program Manager to serve as my authorized representative for any documents related to compliance with the 2016 Final Permit.

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Craig C. Peters, Colonel, USAF  
Commander

Date



DEPARTMENT OF THE AIR FORCE  
AIR FORCE RESERVE COMMAND

19 June 2019

MEMORANDUM FOR 439 MSG/CE

FROM: 439 AW/CC

SUBJECT: Appointment of Duly Authorized Representative for the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts for the Westover Air Reserve Base

1. AFI 32-1067, *Water and Fuel Systems*, dated February 4, 2015, provides applicable agency guidance for storm water discharge permits. Paragraph 5.2.1 includes storm water permits under the definition of national pollutant discharge elimination system (NPDES) permits. IAW para. 5.2.1, installations that have a storm water permit “should strive to operate under a General Storm Water permit.” Westover is required to seek coverage under the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts because Westover ARB is in an Urbanized Area designated by the Bureau of the Census. IAW para. 4.3.8.1, “reports required by permits and other information must be signed and/or certified by the installation commander except to the extent delegations are authorized under applicable Federal or state regulations.”
2. The United States Environmental Protection Agency (EPA) NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MA MS4 General Permit), Appendix B, effective through June 30, 2022, identifies authorized signers of this permit. IAW subsection 11.A.3, signers on behalf of federal agencies must be “a principal executive officer. . . . For purposes of this subsection, a principal executive officer of a federal agency includes . . . (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.”
3. IAW subsection 11.B of the permit, the senior executive officer of a federal agency may designate a Duly Authorized Representative to sign Permit-related reports if: 1) the authorization is made in writing by a person described above; 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 manager, owner or operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (A duly authorized representative may be either a named individual or any individual occupying a named position); and 3) the signed and dated written authorization is included in the storm water pollution prevention plan, a copy of which must be submitted to the EPA, if requested.
4. IAW subsection 11.D, any person signing documents required under the terms of this permit must include the following 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,

## Appointment of Duly Authorized Representative, MS4 Permit

Page 2

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.”

5. The Base Civil Engineer (439 MSG/CE) has overall responsibility for facility maintenance and environmental permit compliance. 439 MSG/CE is hereby appointed as a Duly Authorized Representative for the Westover Air Reserve Base for the MA MS4 General Permit. This appointment supercedes all previous appointments previously made.

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Date: 2019.06.25 15:50:25 -04'00'

**CRAIG C. PETERS, Colonel, USAF**  
Commander



DEPARTMENT OF THE AIR FORCE  
AIR FORCE RESERVE COMMAND

19 June 2019

MEMORANDUM FOR 439 MSG/CEV

FROM: 439 AW/CC

SUBJECT: Appointment of Duly Authorized Representative for the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts for the Westover Air Reserve Base

1. AFI 32-1067, *Water and Fuel Systems*, dated February 4, 2015, provides applicable agency guidance for storm water discharge permits. Paragraph 5.2.1 includes storm water permits under the definition of national pollutant discharge elimination system (NPDES) permits. IAW para. 5.2.1, installations that have a storm water permit “should strive to operate under a General Storm Water permit.” Westover is required to seek coverage under the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts because Westover ARB is in an Urbanized Area designated by the Bureau of the Census. IAW para. 4.3.8.1, “reports required by permits and other information must be signed and/or certified by the installation commander except to the extent delegations are authorized under applicable Federal or state regulations.”
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## Appointment of Duly Authorized Representative, MS4 Permit

Page 2

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5. The Environmental Engineering Flight (439 MSG/CEV) has overall responsibility for environmental permit compliance. 439 MSG/CEV is hereby appointed as a Duly Authorized Representative for the Westover Air Reserve Base for the MA MS4 General Permit. This appointment supercedes all previous appointments previously made.

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Date: 2019.06.25 15:50:40 -0400

CRAIG C. PETERS, Colonel, USAF  
Commander



DEPARTMENT OF THE AIR FORCE  
AIR FORCE RESERVE COMMAND

19 June 2019

MEMORANDUM FOR 439 MSG/CC

FROM: 439 AW/CC

SUBJECT: Appointment of Duly Authorized Representative for the General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts for the Westover Air Reserve Base

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4. IAW subsection 11.D, any person signing documents required under the terms of this permit must include the following 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.”

5. The Mission Support Group Commander (439 MSG/CC) has overall responsibility for facility maintenance and environmental permit compliance. 439 MSG/CC is hereby appointed as a Duly Authorized Representative for the Westover Air Reserve Base for the MA MS4 General Permit. This appointment supercedes all previous appointments previously made.

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CRAIG C. PETERS, Colonel, USAF  
Commander

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## **Appendix B**

### **2016 Final MS4 Permit**

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**United States Environmental Protection Agency (EPA)  
National Pollutant Discharge Elimination System (NPDES)**

**GENERAL PERMITS FOR STORMWATER DISCHARGES FROM  
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS  
IN MASSACHUSETTS  
(as modified)**

**AUTHORIZATION TO DISCHARGE UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Clean Water Act (CWA), as amended (33 U.S.C. §1251 *et seq.*), and the Massachusetts Clean Waters Act, as amended (M.G.L. Chap.21 §§ 26-53), any operator of a small municipal separate storm sewer system whose system:

- Is located in the areas described in part 1.1;
- Is eligible for coverage under part 1.2 and part 1.9; and
- Submits a complete and accurate Notice of Intent in accordance with part 1.7 of this permit and EPA issues a written authorization

is authorized to discharge in accordance with the conditions and the requirements set forth herein.

The following appendices are also included as part of these permits:

- Appendix A – Definitions, Abbreviations, and Acronyms;
- Appendix B – Standard permit conditions applicable to all authorized discharges;
- Appendix C – Endangered Species Act Eligibility Guidance;
- Appendix D – National Historic Preservation Act Eligibility Guidance;
- Appendix E – Information required for the Notice of Intent (NOI);
- Appendix F – Requirements for MA Small MS4s Subject to Approved TMDLs;
- Appendix G – Impaired Waters Monitoring Parameter Requirements;
- Appendix H – Requirements related to discharges to certain water quality limited waterbodies;

This modifies parts: 2.0; 2.1; 2.1.1; 2.1.2.a; 2.2.; 2.2.2 (paragraphs 2 and 3); 2.3.3; 2.3.5; 2.3.6; 2.3.7.b; 4.1; 4.4; 5.1.5; 6.5; Appendix F part A.I; Appendix F part A.II; and Appendix H of the permits that became effective on July 1, 2018

These permit modifications become effective on **January 6, 2021**.

These permits and the authorization to discharge expire at midnight, **June 30, 2022**.

Signed this **7th** day of **December 2020**

Signed this **7th** day of **December 2020**

/S/Signature On File

\_\_\_\_\_  
Ken Moraff, Director  
Water Division  
United States Environmental Protection Agency  
5 Post Office Square – Suite 100  
Boston, Massachusetts 02109-3912

  
\_\_\_\_\_  
Lealdon Langley, Director  
Division of Watershed Management  
Department of Environmental Protection  
One Winter Street  
Boston, Massachusetts 02108

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## 1.0. Introduction

This document consists of three (3) general permits listed in part 1.1. Each general permit is applicable to a particular type of municipal system within Massachusetts. Many of the permit terms and conditions are applicable across all regulated entities, and therefore are presented just once in parts 1-2, part 4, and Appendices A through E. Other conditions are applicable to a particular set of authorized entities; these terms and conditions are included in parts 3, and 5 and Appendices F through H. Throughout the permit, the terms “this permit” or “the permit” will refer to the three general permits.

### 1.1. Areas of Coverage

This permit covers small municipal separate storm sewer systems (MS4s) located in the Commonwealth of Massachusetts:

- Traditional Cities and Towns (NPDES Permit No. MAR041000)
- State, federal, county and other publicly owned properties (Non-traditional) (MAR042000)
- State transportation agencies (except for MassDOT- Highway Division) (MAR043000)

### 1.2. Eligibility

The MS4 shall meet the eligibility provisions described in part 1.2.1 and part 1.9 to be eligible for authorization under this permit.

#### 1.2.1. Small MS4s Covered

This permit authorizes the discharge of stormwater from small MS4s as defined at 40 CFR § 122.26(b) (16). This includes MS4s described in 40 CFR §122.32(a) (1) and (a) (2). An MS4 is eligible for coverage under this permit if it is:

- A small MS4 within the Commonwealth of Massachusetts;
- Not a large or medium MS4 as defined in 40 CFR §§122.26(b)(4) or (7);
- Located either fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census as of the effective date of this permit (the 2010 Census); or
- Located in a geographic area designated by EPA as requiring a permit.

If the small MS4 is not located entirely within an urbanized area, only the portion of the MS4 that is located within the urbanized area is regulated under 40 CFR §122.32(a) (1).

A small municipal separate storm sewer system means all separate storm sewers that are:

- Owned or operated by the United States, a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.
- Not defined as large or medium municipal separate storm sewer systems pursuant to 40 CFR § 122.26(b) (4) and (b) (7) or designated under 40 CFR § 122.26(a) (1) (v).
- This term includes systems similar to separate storm sewer systems in municipalities such as systems at military bases, large hospitals or prison complexes, and highways

and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

### 1.3. Limitations on Coverage

This permit does not authorize the following:

- a. Stormwater discharges mixed with sources of non-stormwater unless such non-stormwater discharges are:
  - Authorized under a separate NPDES permit; or
  - A non-stormwater discharge as listed in part 1.4.
- b. Stormwater discharges associated with industrial activity as defined in 40 CFR §122.26 (b) (14) (i)-(ix) and (xi).
- c. Stormwater discharges associated with construction activity as defined in 40 CFR §122.26(b) (14) (x) or (b) (15).
- d. Stormwater discharges currently authorized under another NPDES permit, including discharges covered under other regionally issued general permits.
- e. Stormwater discharges or discharge related activities that are likely to adversely affect any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. The permittee shall follow the procedures detailed in Appendix C to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.
- f. Stormwater discharges whose direct or indirect impacts do not prevent or minimize adverse effects on any Essential Fish Habitat.
- g. Stormwater discharges, or implementation of a stormwater management program, which adversely affects properties listed or eligible to be listed on the National Register of Historic Places. The permittee shall follow the procedures detailed in Appendix D to make a determination regarding eligibility. The permittee shall certify compliance with this provision on the submitted NOI.
- h. Stormwater discharges prohibited under 40 CFR § 122.4.
- i. Stormwater discharges to the subsurface subject to state Underground Injection Control (UIC) regulations. Although the permit includes provisions related to infiltration and groundwater recharge, structural controls that dispose of stormwater into the ground may be subject to UIC regulation requirements. Authorization for such discharges shall be obtained from Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, Underground Injection Control, One Winter Street, Boston, MA 02108 – phone 617-292-5859.
- j. Any non-traditional MS4 facility that is a “new discharger” as defined in part 5.1.4. and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease

(Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants.

#### **1.4. Non-Stormwater Discharges**

The following categories of non-stormwater discharges are allowed under this permit *unless* the permittee, EPA, or the MassDEP identifies any category or individual discharge of non-stormwater discharge in part 1.4.a-r as a significant contributor of pollutants to the MS4, then that category or individual discharge is not allowed under part 1.4, but rather shall be deemed an “illicit discharge” under part 2.3.4.1, and the permittee shall address that category or individual discharge as part of the Illicit Discharge Detection and Elimination (IDDE) Program described in part 2.3.4 of this permit.

- a. Water line flushing
- b. Landscape irrigation
- c. Diverted stream flows
- d. Rising ground water
- e. Uncontaminated ground water infiltration (as defined at 40 CFR § 35.2005(20))
- f. Uncontaminated pumped ground water
- g. Discharge from potable water sources
- h. Foundation drains
- i. Air conditioning condensation
- j. Irrigation water, springs
- k. Water from crawl space pumps
- l. Footing drains
- m. Lawn watering
- n. Individual resident car washing
- o. Flows from riparian habitats and wetlands
- p. De-chlorinated swimming pool discharges
- q. Street wash waters
- r. Residential building wash waters without detergents

Discharges or flows from firefighting activities are allowed under this permit need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

#### **1.5. Permit Compliance**

Non-compliance with any of the requirements of this permit constitutes a violation of the permit and the CWA and may be grounds for an enforcement action and may result in the imposition of injunctive relief and/or penalties.

#### **1.6. Continuation of this Permit**

If this permit is not reissued prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and remain in force and effect for discharges that were authorized prior to expiration. If a small MS4 was granted permit authorization prior to the expiration date of this permit, it will automatically remain authorized by this permit until the earliest of:

- Authorization under a reissued general permit following timely and appropriate submittal of a complete and accurate NOI requesting authorization to discharge under the reissued permit; or
- Issuance or denial of an individual permit for the MS4’s discharges; or

- Authorization or denial under an alternative general permit.

If the MS4 operator does not submit a timely, appropriate, complete, and accurate NOI requesting authorization to discharge under the reissued permit or a timely request for authorization under an individual or alternative general permit, authorization under this permit will terminate on the due date for the NOI under the reissued permit unless otherwise specified in the reissued permit.

## **1.7. Obtaining Authorization to Discharge**

### **1.7.1. How to Obtain Authorization to Discharge**

To obtain authorization under this permit, a small MS4 shall:

- Be located in the areas listed in part 1.1 of this permit;
- Meet the eligibility requirements in part 1.2 and part 1.9;
- Submit a complete and accurate Notice of Intent (NOI) in accordance with the requirements of part 1.7.2; and
- EPA issues a written authorization.

### **1.7.2. Notice of Intent**

- a. Operators of Small MS4s seeking authorization to discharge under the terms and conditions of this permit shall submit a Notice of Intent that contains the information identified in Appendix E. This includes operators of small MS4s that were previously authorized under the May 1, 2003 small MS4 general permit (MS4-2003 permit).
- b. The NOI shall be signed by an appropriate official (see Appendix B, Subparagraph B.11, Standard Conditions).
- c. The NOI shall contain the following certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to 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.

Print the name and title of the official, followed by signature and date.

- d. The NOI shall be submitted within 90 days of the effective date of the permit. If EPA notifies an MS4 that it is designated under 40 CFR § 122.32(a) (2) or (b), the NOI shall be submitted within 180 days of receipt of notice unless granted a longer period of time by EPA.

### **1.7.3. Submission of Notice of Intent**

- a. All small MS4s shall submit a complete and accurate Notice of Intent (suggested form in Appendix E) to EPA-Region 1 at the following address:

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

Boston, MA 02109

Or submitted electronically to EPA at the following email address: [stormwater.reports@epa.gov](mailto:stormwater.reports@epa.gov)

b. All small MS4s shall also submit a copy of the NOI to the MassDEP at the following address:

Massachusetts Department of Environmental Protection  
One Winter Street -5th Floor  
Boston, Massachusetts 02108  
ATTN: Frederick Civian, Stormwater Coordinator

c. Late notification: A small MS4 is not prohibited from submitting a NOI after the dates provided in part 1.7.2.d. However, if a late NOI is submitted, authorization is only for discharges that occur after permit authorization is granted. EPA and MassDEP reserve the right to take enforcement actions for any unpermitted discharges. All NOIs submitted after December 21, 2020 must be submitted electronically.

#### **1.7.4. Public Notice of NOI and Effective Date of Coverage**

a. EPA will provide a public notice and opportunity for comment on the contents of the submitted NOIs. The public comment period will be a minimum of 30 calendar days.

b. Based on a review of a small MS4's NOI or other information, EPA may grant authorization, extend the public comment period, or deny authorization under this permit and require submission of an application for an individual or alternative NPDES permit. (See part 1.8) A small MS4 will be authorized to discharge under the terms and conditions of this permit upon receipt of notice of authorization from EPA.

c. Permittees whose authorization to discharge under the MS4-2003 permit, which expired on May 1, 2008, has been administratively continued in accordance with the Administrative Procedure Act 5 U.S.C. § 558(c) and 40 CFR § 122.6, who wish to obtain coverage under this permit, must submit a new NOI requesting permit coverage in accordance with the requirements of part 1.7 of this permit to EPA within 90 days after the effective date of this permit. Permittees whose authorization to discharge under the expired MS4-2003 permit was administratively continued, who fail to submit a timely, complete and accurate NOI or an application for an individual NPDES permit within 90 days after the effective date of this permit will be considered to be discharging without a permit (see 40 CFR § 122.28(b)(3)(iii)).

#### **1.8. Individual Permits and Alternative General Permits**

a. EPA may require a small MS4 to apply for and obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition EPA in accordance with the provisions of 40 CFR § 122.26(f) to require a small MS4 to apply for and/or obtain authorization under either an individual NPDES permit or an alternative NPDES general permit. If EPA requires a small MS4 to apply for an individual or alternative NPDES permit, EPA will notify the small MS4 in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and will provide application information and an application deadline. If a small MS4 is authorized under the MS4-2003 permit or this permit and fails to submit an individual NPDES or an alternative general permit NPDES permit application as required by EPA, then the authorization under the MS4-2003 permit or this permit to the small MS4 is automatically terminated at the end of the date specified by EPA as the deadline

for application submittal. EPA reserves the right to take enforcement action for any unpermitted discharge.

- b. A small MS4 may request to be excluded from this general permit by applying for an individual permit or authorization under an alternative general permit. In such a case, a small MS4 shall submit an individual permit application in accordance with the requirements of 40 CFR § 122.33(b) (2) (i) or § 122.33(b) (2) (ii), with reasons supporting the request, to EPA at the address listed in part 1.7.3 of this permit. The request may be granted by issuance of an individual permit or authorization under an alternative general permit if EPA determines that the reasons stated by the small MS4 are adequate to support the request. (See 40 CFR § 122.28(b) (3)).
- c. When an individual NPDES permit is issued, or a small MS4 is authorized to discharge under an alternative NPDES general permit, authorization under this permit automatically terminates on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

## **1.9. Special Eligibility Determinations**

### **1.9.1. Documentation Regarding Endangered Species**

The small MS4 shall certify eligibility regarding endangered species in the NOI required by part 1.7.2. The Stormwater Management Program (SWMP) shall include documentation supporting the permittee's eligibility determination with regard to federal Endangered and Threatened Species and Critical Habitat Protection, including:

- Results of the Appendix C U.S. Fish and Wildlife Service endangered species screening determination; and
- If applicable, a description of the measures the small MS4 shall implement to protect federally listed endangered or threatened species, or critical habitat, including any conditions imposed by the U.S. Fish and Wildlife Service. If a permittee fails to document and implement such measures, the permittee's discharges are ineligible for coverage under this permit.

### **1.9.2. Documentation Regarding Historic Properties**

The small MS4 shall certify eligibility regarding historic properties on the NOI required by part 1.7.2. The SWMP shall include documentation supporting the small MS4's eligibility determination with regard to Historic Properties Preservation, including:

- Information on whether the permittee's stormwater discharges, allowable non-stormwater discharges, or stormwater discharge-related activities would have an effect on a property that is listed or eligible for listing on the National Register of Historic Properties (NRHP);
- Where such effects may occur, any documents received by the permittee or any written agreements the permittee has made with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), or other Tribal representative to mitigate those effects;
- Results of the Appendix D historic property screening investigations; and
- If applicable, a description of the measures the permittee shall implement to avoid or minimize adverse impacts on places listed, or eligible for listing, on the NRHP, including any conditions imposed by the SHPO or THPO. If the permittee fails to

document and implement such measures, those discharges are ineligible for coverage under this permit.

### **1.10. Stormwater Management Program (SWMP)**

- a. The permittee shall develop and implement a written (hardcopy or electronic) SWMP. The SWMP shall be signed in accordance with Appendix B, Subsection 11, including the date of signature. A signature and date is required for initial program preparation and for any significant revision to the program, which shall be in writing. The written SWMP shall be completed within one (1) year of the effective date of the permit.

The SWMP is the document used by the permittee to describe and detail the activities and measures that will be implemented to meet the terms and conditions of the permit. The SWMP shall accurately describe the permittees plans and activities. The document should be updated and/or modified during the permit term as the permittee's activities are modified, changed or updated to meet permit conditions during the permit term.

- b. Permittees authorized by the MS4-2003 permit shall modify or update their existing Best Management Practices (BMPs) and measurable goals to meet the terms and conditions of part 2.3 of this permit within one (1) year of the effective date of the permit. These modifications and updates shall be reflected in the written (hardcopy or electronic) SWMP. Permittees authorized by the MS4-2003 permit shall continue to implement their existing SWMP until the program has been updated.

#### **1.10.1. Stormwater Management Program Availability**

- a. The permittee shall retain a copy of the current SWMP required by this permit at the office or facility of the person listed as the program contact on the submitted Notice of Intent (NOI). The SWMP shall be immediately available to representatives from EPA, MassDEP, U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) at the time of an onsite inspection or upon request.
- b. The permittee shall make the SWMP available to the public during normal business hours. The permittee shall also post the SWMP online<sup>1</sup> if the permittee has a website on which to post the SWMP.

#### **1.10.2. Contents and Timelines of the Stormwater Management Program for 2003 permittees**

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;
- Documentation of compliance with part 1.9.2;

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<sup>1</sup> Should a permittee not wish to post mapping information included in the SWMP (see part 1.10.2) on their website for public safety reasons, they must state the reason either with or within the online SWMP and provide how the MS4 mapping information can be obtained. The permittee must retain the entire SWMP, including all completed mapping, at a location where it can be made available to the public during normal business hours.

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- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2;
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements) identified in the permittee's NOI and any updates to those BMPs within the first year;  
For each permit condition in part 2.3 identify:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6;
- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;
- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770.
- Description of activities to achieve compliance with part 3.0;
- Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within two (2) years of the permit effective date and updated annually thereafter, as necessary:

- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and the number of interconnections;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;
- The map of the separate storm sewer system required by part 2.3.4.5.

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable

deadlines in Appendix F and H and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (TMDL requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;
- Description of any other practices to achieve compliance with part 2.1 (water quality based requirements)

### **1.10.3. Contents and Timelines of the Stormwater Management Program for New Permittees**

a. Permittees seeking authorization for the first time shall meet all deadlines contained in this permit except the following:

- 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;
- The ordinances, by-laws, or other regulatory mechanisms required by parts 2.3.4, 2.3.5 and 2.3.6 shall be completed as soon as possible, but no later than three (3) years from the permit effective date; and
- All other deadlines in part 2.3.4 shall be extended by three (3) years.
- All other deadlines in part 2.3.5, 2.3.6 and 2.3.7 shall be extended by two (2) years.
- All deadlines for discharges to water quality limited waters without a TMDL under part 2.2.2 shall be extended by two (2) years.

b. Contents of the Stormwater Management Program for New Permittees

The following information must be included in the SWMP within one (1) year of the permit effective date and updated annually thereafter, as necessary:

- Identification of names and titles of people responsible for program implementation. If a position is currently unfilled, list the title of the position and modify the SWMP with the name once the position is filled;
- Documentation of compliance with part 1.9.1;
- Documentation of compliance with part 1.9.2;
- Documentation of authorization of all new or increased discharges granted by MassDEP in compliance with part 2.1.2;
- Listing of all discharges identified pursuant to part 2.1.1 and description of response;
- Description of practices to achieve compliance with part 2.3 (MEP requirements)

identified in the permittee's NOI and any updates to those BMPs within the first year;

For each permit condition in part 2.3 identify:

- The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal shall have a measure of assessment associated with it;
- Description of measures to avoid or minimize impacts to surface public drinking water supply sources. The permittee is also encouraged to include provisions to notify public water supplies in the event of an emergency. Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program, One Winter Street, Boston, MA 02108 – phone 617.292.5770. Description of activities to achieve compliance with part 3.0;
  - Annual program evaluation (part 4.1). Update annually and maintain copies.

The following information must be included in the SWMP within three (3) years of the permit effective date and updated annually thereafter, as necessary:

- Written procedures for site inspections and enforcement of sediment and erosion control procedures in accordance with part 2.3.5;

The following information must be included in the SWMP within four (4) years of the permit effective date and updated annually thereafter, as necessary:

- Outfall and interconnection inventory;
- Sanitary Sewer Overflow (SSO) inventory including all of the information required in part 2.3.4.4.b;
- Written IDDE Program pursuant to part 2.3.4.6.
- Written operation and maintenance procedures for municipal activities in part 2.3.7.a.ii;
- Written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4 in accordance with part 2.3.7.a.iii.1;
- Written procedures to require submission of as-built drawings and ensure long term operation and maintenance in accordance with part 2.3.6.a.iii;

The following information must be included in the SWMP within five (5) years of the permit effective date and updated annually thereafter, as necessary:

- Phase 1 of the map of the separate storm sewer system required by part 2.3.4.5;
- Listing of all receiving waterbody segments, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs and WLAs, and number of outfalls from the MS4 that discharge to each waterbody. In addition to the receiving water, the permittee shall document in the SWMP all surface public drinking water sources that may be impacted by MS4 discharges;
- Listing of all interconnected MS4s and other separate storm sewer systems receiving a discharge from the permitted MS4, the receiving waterbody segment(s) ultimately receiving the discharge, their classification under the applicable state water quality standards, any impairment(s) and associated pollutant(s) of concern, applicable TMDLs

and WLAs, and the number of interconnections;

The following information must be included in the SWMP within six (6) years of the permit effective date and updated annually thereafter, as necessary:

- Report(s) assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover.

The following information must be included in the SWMP concurrent with the applicable deadlines in Appendix F and H (extended by two (2) years) and updated annually thereafter, as necessary:

- Description of practices to achieve compliance with part 2.2.1 (discharges subject to requirements related to approved TMDLs) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment.
- Description of practices to achieve compliance with part 2.2.2 (discharges to certain water quality limited waters subject to additional requirements) including:
  - The person(s) or department responsible for the measure;
  - The BMPs for the control measure or permit requirement;
  - The measurable goal(s) for each BMP. Each measurable goal shall include milestones and timeframes for its implementation and have a quantity or quality associated with its endpoint. Each goal must have an associated measure of assessment;
- Description of any other practices to achieve compliance with part 2.1 (water quality based requirements).

## **2.0. Non-Numeric Effluent Limitations**

This section includes terms and conditions necessary to reduce the discharge of pollutants from the MS4 to the maximum extent practicable; to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act and the Massachusetts Water Quality Standards.

### **2.1. Water Quality Based Effluent Limitations**

Pursuant to Clean Water Act 402(p)(3)(B)(iii), this permit includes provisions to ensure that discharges from the permittee's small MS4 meet applicable water quality standards as set forth in part 2.1.1. below.

#### **2.1.1. Requirement to Meet Water Quality Standards**

- a. The permittee's discharges shall meet applicable water quality standards by complying with parts 2.1.1.b and/or 2.1.1.c in accordance with the schedules set forth therein.<sup>2</sup> Any other

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<sup>2</sup> Applicable water quality standards are the state standards that have been federally approved or promulgated as of the issuance date of this permit and are compiled by EPA at <http://www.epa.gov/waterscience/standards/wqslibrary/>.

discharge of a pollutant that: (i) is not addressed by part 2.1.1.b, part 2.1.1.c, part 2.2.1, and/or part 2.2.2, (ii) is not the result of an illicit discharge subject to part 2.3.4, and (iii) does not meet applicable water quality standards, either independently or in conjunction with other discharges, shall comply with part 2.1.1.d.

- b. If there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is subject to an EPA approved or established TMDL identified in part 2.2.1, the permittee is subject to the requirements of part 2.2.1 and Appendix F of this permit and the permittee shall comply with all applicable schedules, alternative schedules and requirements in Appendix F. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix F or any alternative schedules applicable to it will constitute compliance with part 2.1.1.a. of the Permit for discharges of pollutants addressed in Appendix F.
- c. If (i) there is a discharge from the MS4 to a waterbody (or its tributaries in some cases) that is water quality limited (see definition in Appendix A) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease) and is not subject to an approved TMDL, or (ii) the MS4 is located within a municipality listed in part 2.2.2.a.-b., then the permittee is subject to the requirements of part 2.2.2 and Appendix H of this permit and the permittee shall comply with all applicable schedules and requirements in Appendix H. A permittee's compliance with all applicable requirements and BMP implementation schedules in Appendix H applicable to it will constitute compliance with part 2.1.1.a. of the Permit for discharges of pollutants addressed in Appendix H.
- d. Pursuant to Part 2.1.1.a, upon notice from EPA or MassDEP to the permittee that a discharge of a pollutant from the MS4 that is exceeding applicable water quality standards, the permittee must, within 60 days, remedy the exceedance or eliminate the discharge. However, where such remedy or elimination within 60 days is impracticable, the permittee shall submit to EPA, by the same deadline, a schedule of actions to achieve a remedy or elimination in the shortest time not impracticable. The permittee shall implement such actions on the schedule submitted to EPA and report on progress in its annual reports unless or until EPA takes any other action that effectively replaces the schedule..

### **2.1.2. Increased Discharges**

- a. Any increased discharge, including increased pollutant loading(s) through the MS4 to waters of the United States is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for increased discharges where appropriate<sup>3</sup>. Any authorization of an increased discharge by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies conditions or requirements related to the increased discharge, such requirements may be independently enforceable under State law and may be adopted into a future permit.
- b. There shall be no increased discharges, including increased pollutant loading(s) from the MS4 to impaired waters listed in categories 5 or 4b on the most recent Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) unless the permittee

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<sup>3</sup> Contact MassDEP for guidance on compliance with 314 CMR 4.04

demonstrates that there is no net increase in loading from the MS4 to the impaired water of the pollutant(s) for which the waterbody is impaired. The permittee may demonstrate compliance with this provision by *either*:

- i. Documenting that the pollutant(s) for which the waterbody is impaired is not present in the MS4's discharge and retaining documentation of this finding with the SWMP; or
  - ii. Documenting that the total load of the pollutant(s) of concern from the MS4 to any impaired portion of the receiving water will not increase as a result of the activity and retaining documentation of this finding in the SWMP. Unless otherwise determined by the Permittee, USEPA or by MassDEP that additional demonstration is necessary, compliance with the requirements of part 2.2.2 and part 2.3.6 of this Permit, including all reporting and documentation requirements, shall be considered as demonstrating no net increase as required by this part.
- c. The requirements of this part are independent of permit conditions requiring reduction in discharges of pollutants as set forth in parts 2.1.1 and 2.2 (water quality based requirements) and 2.3 (requirements to reduce discharge of pollutants to the maximum extent practicable). Permittees remain subject to requirements to reduce the discharge of pollutants from the MS4 as set forth in those parts.

## **2.2. Discharges to Certain Impaired Waters**

The permittee shall identify in the SWMP and Annual Reports all MS4 discharges, including both outfalls and interconnections to other MS4s or other separate storm sewer systems, that:

- Are subject to Total Maximum Daily Load (TMDL) related requirements as identified in part 2.2.1.
- Are subject to additional requirements to protect water quality as identified in part 2.2.2.

The discharge location from an interconnection shall be determined based on the receiving water of the outfall from the interconnected system.

Permittees are subject to the applicable requirements in part 2.2.1, Appendix F, or an approved alternative structural control implementation schedule, and/or the applicable requirements in part 2.2.2, and Appendix H.

### **2.2.1. Discharges Subject to Requirements Related to an Approved TMDL**

- a. "Approved TMDLs" are those that have been approved by EPA as of the date of issuance of this permit.
- b. The MS4s specified below discharge to waters within Massachusetts that are subject to TMDLs, or in some cases, to tributaries of such waters, and shall comply with the requirements of Appendix F, part A. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the terms of the approved TMDL. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

- i. The following is a list of municipalities in the Charles River Watershed:

1.

Arlington	Mendon
Ashland	Milford
Bellingham	Millis
Belmont	Natick
Brookline	Needham
Cambridge	Newton
Dedham	Norfolk
Dover	Sherborn
Foxborough	Walpole
Franklin	Waltham
Holliston	Watertown
Hopedale	Wayland
Hopkinton	Wellesley
Lexington	Weston
Lincoln	Westwood
Medfield	Wrentham
Medway	

Permittees that operate regulated MS4s located in municipalities listed above that discharge to the Charles River or its Tributaries shall meet the requirements of Appendix F, part A.I with respect to the reduction of phosphorus discharges from their MS4.

ii. The following is a list of municipalities that contain a lake or pond subject to an approved lake or pond phosphorus TMDL in the Northern Blackstone Basin, Chicopee Basin, Connecticut Basin, French Basin, Millers Basin or in the watershed of Bare Hill Pond, Flint Pond, Indian Lake, Lake Boon, Lake Quinsigamond, Leesville Pond, Salisbury Pond, Quaboag Pond or Quacumquasit Pond.

1.

Auburn	Millbury
Charlton	Oxford
Dudley	Shrewsbury
Gardner	Spencer
Grafton	Springfield
Granby	Stow
Hadley	Templeton
Harvard	Westminster
Hudson	Winchendon
Leicester	Wilbraham

Ludlow	
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Permittees that operate regulated MS4s in the above municipalities that discharge to waterbodies listed on Table F-6 in Appendix F or their tributaries, and any other MS4 that discharges to waterbodies listed on Table F-6 in Appendix F or their tributaries, shall meet the requirements of Appendix F, part A.II with respect to reduction of phosphorus discharges from their MS4.

iii. The following is a list of municipalities that contain waters subject to an approved TMDL for bacteria or pathogens.

1.

Abington	Marshfield
Acushnet	Mashpee
Andover	Mattapoisett
Avon	Medfield
Barnstable	Medway
Bedford	Melrose
Bellingham	Mendon
Belmont	Milford
Berkley	Millis
Beverly	Milton
Billerica	Nahant
Bourne	Natick
Brewster	Needham
Bridgewater	New Bedford
Brockton	Newton
Brookline	Norfolk
Burlington	North Andover
Cambridge	Norton
Canton	Norwell
Chatham	Norwood
Cohasset	Orleans
Concord	Peabody
Danvers	Pembroke
Dartmouth	Plymouth
Dedham	Raynham
Dennis	Rehoboth
Dighton	Revere
Dover	Rockland
Duxbury	Rockport
East Bridgewater	Salem

Eastham	Sandwich
Essex	Saugus
Everett	Scituate
Fairhaven	Seekonk
Fall River	Sharon
Falmouth	Sherborn
Foxborough	Somerset
Franklin	Stoughton
Freetown	Swampscott
Gloucester	Swansea
Hanover	Taunton
Hanson	Tewksbury
Harwich	Wakefield
Holliston	Walpole
Hopedale	Waltham
Hopkinton	Wareham
Ipswich	Watertown
Kingston	Wellesley
Lawrence	Wellfleet
Lexington	West Bridgewater
Lincoln	Weston
Lynn	Westport
Lynnfield	Westwood
Malden	Whitman
Manchester	Wilmington
Mansfield	Winthrop
Marblehead	Yarmouth
Marion	

The operators of MS4s located in municipalities listed above that discharge to a waterbody segment listed on Table F-8 in Appendix F and any other MS4 that discharges directly to a waterbody segment listed on Table F-8 in Appendix F shall meet the requirements of Appendix F, part A.III with respect to reduction of bacteria/pathogens discharges from their MS4.

- iv. The following is a list of municipalities located on Cape Cod that contain waters subject to an approved TMDL for nitrogen (Total Nitrogen).

1.

Bourne
Barnstable
Chatham
Falmouth

Harwich
Mashpee
Orleans
Yarmouth

Permittees that operate regulated MS4s located in the municipalities above that discharge to waterbodies found on Table F-9 in Appendix F or their tributaries and any other MS4 that discharges to waterbodies found on Table F-9 in Appendix F or their tributaries shall meet the requirements of Appendix F, part A.IV with respect to reduction of nitrogen discharges from their MS4.

- v. The following is a list of municipalities located in the Assabet River Watershed:

- 1.

Acton	Hudson
Berlin	Littleton
Bolton	Marlborough
Boxborough	Maynard
Boylston	Northborough
Carlisle	Shrewsbury
Clinton	Stow
Concord	Westborough
Grafton	Westford
Harvard	

Permittees that operate regulated MS4s located in the municipalities above that discharge to the Assabet River or its tributaries shall meet the requirements of Appendix F part A.V with respect to reduction of phosphorus discharges from their MS4.

- c. The MS4s specified below discharge to waters, or tributaries of waters, that have been identified in an adjacent state’s approved TMDL as being impaired due, in part, to MS4 stormwater discharges in Massachusetts, and shall comply with the requirements of Appendix F, part B. Appendix F identifies, by section, the provisions the permittee shall implement to be consistent with the reasonable assumptions related to Massachusetts MS4 discharges. Alternatively, EPA may notify the permittee that an individual permit application is necessary in accordance with part 1.8.a.

- i. The following is a list of municipalities in Massachusetts located in the watershed of Long Island Sound, which has an approved TMDL for nitrogen (Total Nitrogen).

- 1.

Adams	North Adams
Agawam	Northampton
Amherst	Oxford
Ashburnham	Palmer

Ashby	Paxton
Auburn	Pelham
Belchertown	Pittsfield
Charlton	Richmond
Cheshire	Russell
Chicopee	Rutland
Dalton	South Hadley
Douglas	Southampton
Dudley	Southbridge
East Longmeadow	Southwick
Easthampton	Spencer
Gardner	Springfield
Granby	Sturbridge
Hadley	Sutton
Hampden	Templeton
Hatfield	Ware
Hinsdale	Webster
Holyoke	West Springfield
Lanesborough	Westfield
Leicester	Westhampton
Lenox	Westminster
Longmeadow	Wilbraham
Ludlow	Williamsburg
Millbury	Winchendon
Monson	

Permittees that operate regulated MS4s located in the municipalities above that discharge to a water within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed shall meet the requirements of Appendix F part B. I with respect to nitrogen discharges from their MS4.

- ii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing phosphorus to waterbody segments that have out of state approved TMDLs for phosphorus:

- 1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk
Swansea

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-12 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. II with respect to phosphorus discharges from their MS4.

- iii. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing bacteria/pathogens to waterbody segments that have out of state approved TMDLs for bacteria/pathogens:

- 1.

Attleboro
North Attleborough
Plainville
Rehoboth
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-13 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. III with respect to bacteria/pathogens discharges from their MS4.

- iv. The following is a list of municipalities in Massachusetts identified in a TMDL as containing MS4s contributing metals (cadmium, lead, aluminum iron) to waterbody segments that have out of state approved TMDLs for metals (cadmium, lead, aluminum, iron):

- 1.

Attleboro
North Attleborough
Plainville
Seekonk

Permittees that operate regulated MS4s located in the municipalities above that discharge to a waterbody found on Table F-14 in Appendix F or its tributaries shall meet the requirements of Appendix F part B. IV with respect to metals discharges from their MS4.

**2.2.2. Discharges to Certain Water Quality Limited Waters Subject to Additional Requirements**

For purposes of this permit, a ‘water quality limited water body’ is any water body that does not meet applicable water quality standards, including but not limited to waters listed in categories 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b).

If there is a discharge from the MS4 to a water quality limited waterbody where pollutants typically found in stormwater (specifically nutrients (Total Nitrogen or Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) and oil and grease (Petroleum Hydrocarbons or Oil and Grease)) are the cause of the impairment and is not subject to part 2.1.1.b for those pollutants, or the MS4 is located in a town listed in part 2.2.2.a.-b, the permittee shall comply with the provisions

in Appendix H applicable to it. Permittees notified by EPA or MassDEP during the permit term that they are discharging to a water quality limited water shall update their SWMP to include measures they must take in accordance with Appendix H.

In the absence of a defined pollutant reduction target and where no approved TMDL has been established as of the issuance date of this permit, this permit part and Appendix H define an iterative approach addressing pollutant reductions to waterbodies where the permittee’s discharge is not meeting applicable water quality standards due to nutrients (Total Nitrogen Total Phosphorus), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride), metals (Cadmium, Copper, Iron, Lead or Zinc) or oil and grease (Petroleum Hydrocarbons or Oil and Grease).

a. Discharges to water quality limited waterbodies where nitrogen (Total Nitrogen) is the cause of the impairment, or their tributaries

i. The requirements of this part are applicable to:

1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to nitrogen (Total Nitrogen), or their tributaries.

Abington	Mattapoisett
Acushnet	Middleborough
Attleboro	New Bedford
Avon	Norton
Barnstable	Peabody
Berkley	Pembroke
Bourne	Plainville
Bridgewater	Plymouth
Brockton	Plympton
Carver	Raynham
Dartmouth	Rehoboth
Dighton	Rochester
East Bridgewater	Salem
Easton	Seekonk
Fairhaven	Sharon
Fall River	Somerset
Foxborough	Stoughton
Freetown	Swansea
Halifax	Taunton
Hanson	Wakefield
Holbrook	Wareham
Kingston	West Bridgewater
Lakeville	Westport

Lynnfield	Whitman
Mansfield	Wrentham
Marion	Yarmouth

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to nitrogen (Total Nitrogen), or a tributary of such water.
    - ii. Permittees subject to part 2.2.2.a.i above shall meet the requirements of Appendix H part I with respect to the control of nitrogen discharges from their MS4;
    - iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a nitrogen (Total Nitrogen) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.a.i and Appendix H part I.
- b. Discharges to water quality limited waterbodies where phosphorus (“Total Phosphorus”) is the cause of the impairment, or their tributaries
- i. The requirements of this part are applicable to:
    1. Permittees (including traditional and non-traditional MS4s) that own or operate an MS4 in the following municipalities. Discharges from MS4s within these municipalities are to waterbodies that are impaired due to phosphorus (Total Phosphorus), or their tributaries.

Abington	Lynn
Acushnet	Lynnfield
Andover	Malden
Arlington	Mansfield
Ashburnham	Marlborough
Ashland	Mashpee
Auburn	Medfield
Avon	Medford
Ayer	Melrose
Barnstable	Mendon
Bedford	Methuen
Belchertown	Millbury
Belmont	Millville
Billerica	Milton
Blackstone	North Andover
Bolton	Northbridge
Brewster	Norton

Bridgewater	Norwood
Brockton	Oxford
Burlington	Peabody
Cambridge	Pembroke
Canton	Pepperell
Carlisle	Pittsfield
Carver	Quincy
Chelmsford	Randolph
Chelsea	Reading
Clinton	Revere
Concord	Rockland
Dalton	Salem
Dedham	Scituate
Douglas	Seekonk
Dover	Sharon
Dracut	Shirley
Dunstable	Shrewsbury
East Bridgewater	Somerville
Eastham	Southampton
Easthampton	Spencer
Everett	Springfield
Falmouth	Stoneham
Fitchburg	Stoughton
Foxborough	Sudbury
Framingham	Sutton
Gloucester	Taunton
Grafton	Tewksbury
Granby	Townsend
Groton	Tyngsborough
Halifax	Upton
Hanover	Uxbridge
Hanson	Wakefield
Harvard	Walpole
Haverhill	Wareham
Hinsdale	Watertown
Hopkinton	Wayland
Hudson	West Bridgewater
Lancaster	Westfield

Lawrence	Westminster
Leicester	Westwood
Lenox	Whitman
Leominster	Wilmington
Lexington	Winchendon
Littleton	Winchester
Lowell	Winthrop
Lunenburg	Woburn
Lynn	

2. Any other permittee that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to phosphorus (“Total Phosphorus”), or to a tributary of such water.
    - ii. The permittees subject to part 2.2.2.b.i. above shall meet all requirements of Appendix H part II with respect to the control of phosphorus discharges from the MS4.
    - iii. During development of their Notice of Intent, the permittee may determine that all discharges from the regulated area through their MS4 are outside of a watershed that contains a phosphorus (“Total Phosphorus”) impairment in a downstream segment. The permittee shall retain all documentation used in this determination as part of their NOI and are relieved from the requirements of part 2.2.2.b.i and Appendix H part II.
- c. Discharges to water quality limited waterbodies where bacteria or pathogens is the cause of the impairment
- i. The requirements of this part are applicable to:
    1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where bacteria or pathogens (E. Coli, Enterococcus or Fecal Coliform) is the cause of the impairment.
    2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to bacteria or pathogens.
  - ii. The permittees subject to part 2.2.2.c.i. shall meet all requirements of Appendix H part III with respect to reduction of bacteria or pathogens discharges from the MS4.
- d. Discharges to water quality limited waterbodies where chloride (Chloride) is the cause of the impairment
- i. The requirements of this part are applicable to:
    1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where chloride (Chloride) is the cause of the impairment.

2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to chloride (Chloride).
- ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part IV with respect to reduction of chloride discharges from the MS4.
- e. Discharges to water quality limited waterbodies where oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment
- i. The requirements of this part are applicable to:
    1. Any MS4 discharge identified by the permittee on their Notice of Intent as discharging directly to an impaired waterbody on the most recent EPA approved Massachusetts 303(d) list where oil and grease, solids or metals (Oil and Grease, Petroleum Hydrocarbons TSS, Turbidity, Cadmium, Copper, Iron, Lead or Zinc) is the cause of the impairment.
    2. Any other MS4 that, during the permit term, becomes aware that its discharge is to a waterbody that is water quality limited due to oil and grease (Petroleum Hydrocarbons or Oil and Grease), solids (TSS or Turbidity) or metals (Cadmium, Copper, Iron, Lead or Zinc).
  - ii. The permittees subject to part 2.2.2.d.i. shall meet all requirements of Appendix H part V with respect to reduction of solids, oil and grease or metals discharges from the MS4.

### **2.3. Requirements to Reduce Pollutants to the Maximum Extent Practicable (MEP)**

The permittee shall reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) as detailed in parts 2.3.2 through 2.3.7.

#### **2.3.1. Control Measures**

- a. Permittees authorized under the MS4-2003 permit shall continue to implement their existing SWMPs while updating their SWMPs pursuant to this permit. This permit does not extend the compliance deadlines set forth in the MS4-2003 permit.
- b. Implementation of one or more of the minimum control measures described in parts 2.3.2- 2.3.7 or other permit requirements may be shared with another entity (including another interconnected MS4) or the other entity may fully implement the measure or requirement, if the following requirements are satisfied:
  - The other entity, in fact, implements the control measure.
  - The particular control measure or component thereof undertaken by the other entity is at least as stringent as the corresponding permit requirement.
  - The other entity agrees to implement the control measure on the permittee's behalf. The annual reports must specify that the permittee is relying on another entity to satisfy some of its permit obligations and specify what those obligations are.
  - If the permittee is relying on another governmental entity regulated under 40 CFR §122 to satisfy all of its permit obligations, including the obligation to file annual reports, the permittee shall note that fact in its NOI, but is not required to file annual reports.

- The permittee remains responsible for compliance with all permit obligations if the other entity fails to implement the control measures (or component thereof). The permittee may enter into a legally binding agreement with the other entity regarding the other entity's performance of control measures, but the permittee remains ultimately responsible for permit compliance.

### 2.3.2. Public Education and Outreach

Objective: 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 pollutants in stormwater are reduced.

- a. The permittee shall continue to implement the public education program required by the MS4-2003 permit by distributing educational material to the MS4 community. The educational program shall define educational goals, express specific messages, define the targeted audience for each message, and identify responsible parties for program implementation. If appropriate for the target audience, materials may be developed in a language other than English. At a minimum, the program shall provide information concerning the impact of stormwater discharges on water bodies within the community, especially those waters that are impaired or identified as priority waters. The program shall identify steps and/or activities that the public can take to reduce the pollutants in stormwater runoff and their impacts to the environment.
- b. The educational program shall include education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions (churches, hospitals), and commercial facilities, (3) developers (construction), and (4) industrial facilities, unless one of these audiences is not present in the MS4 community. In such a situation, the MS4 must document in both the NOI and SWMP which audience is absent from the community and no educational messages are required to that audience.
- c. The permittee shall distribute a minimum of two (2) educational messages over the permit term to each audience identified in part 2.3.2.b. The distribution of materials to each audience shall be spaced at least a year apart. Educational messages may be printed materials such as brochures or newsletters; electronic materials such as websites; mass media such as newspaper articles or public service announcement (radio or cable); targeted workshops on stormwater management, or displays in a public area such as town/city hall. The permittee may use existing materials if they are appropriate for the message the permittee chooses to deliver or the permittee may develop its own educational materials. The permittee may partner with other MS4s, community groups or watershed associations to implement the education program to meet this permit requirement.

Some EPA educational materials are available at: <http://cfpub.epa.gov/npstbx/index.html>.

- d. The permittee shall, at a minimum, consider the topics listed in part 2.3.2.d.i. – iv when developing the outreach/education program. The topics are not exclusive and the permittee shall focus on those topics most relevant to the community.
  - i. Residential program: effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses) on water

quality; benefits of appropriate on-site infiltration of stormwater; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; proper management of pet waste; maintenance of septic systems. If the small MS4 area has areas serviced by septic systems, the permittee shall consider information pertaining to maintenance of septic systems as part of its education program.

- ii. Business/Commercial/Institution program: proper lawn maintenance (use of pesticides, herbicides and fertilizer, and information on Massachusetts Regulation 331 CMR 31 pertaining to proper use of phosphorus containing fertilizers on turf grasses); benefits of appropriate on-site infiltration of stormwater; building maintenance (use of detergents); use of salt or other de-icing and anti-icing materials (minimize their use); proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution prevention); proper management of parking lot surfaces (sweeping); proper car care activities (washing of vehicles and maintenance); and proper disposal of swimming pool water by entities such as motels, hotels, and health and country clubs (discharges must be dechlorinated and otherwise free from pollutants).
  - iii. Developers and Construction: proper sediment and erosion control management practices; information about Low Impact Development (LID) principles and technologies; and information about EPA's construction general permit (CGP). This education can also be a part of the Construction Site Stormwater Runoff Control measure detailed in part 2.3.5.
  - iv. Industrial program: equipment inspection and maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt or other de-icing/anti-icing materials; proper storage of salt or other de-icing/anti-icing materials (cover/prevent runoff to storm system and ground water contamination); benefits of appropriate on-site infiltration of stormwater runoff from areas with low exposure to industrial materials such as roofs or employee parking; proper maintenance of parking lot surfaces (sweeping); and requirements for coverage under EPA's Multi-Sector General Permit.
- e. The program shall show evidence of focused messages for specific audiences as well as evidence that progress toward the defined educational goals of the program has been achieved. The permittee shall identify methods that it will use to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge.
  - f. The permittee shall modify any ineffective messages or distribution techniques for an audience prior to the next scheduled message delivery.
  - g. The permittee shall document in each annual report the messages for each audience; the method of distribution; the measures/methods used to assess the effectiveness of the messages, and the method/measures used to assess the overall effectiveness of the education program.

### 2.3.3. Public Involvement and Participation

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

- a. All public involvement activities shall comply with state public notice requirements (MGL Chapter 30A, Sections 18 – 25 – effective 7/10/2010). The SWMP, all documents submitted to EPA in accordance with Appendix F, and all annual reports shall be available to the public online if the permittee has a website on which to post these documents.
- b. The permittee shall annually provide the public an opportunity to participate in the review and implementation of the SWMP.
- c. The permittee shall report on the activities undertaken to provide public participation opportunities including compliance with part 2.3.3.a. Public participation opportunities pursuant to part 2.3.3.b may include, but are not limited to, websites; hotlines; clean-up teams; monitoring teams; or an advisory committee.

### 2.3.4 Illicit Discharge Detection and Elimination (IDDE) Program

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

- a. Legal Authority - The IDDE program shall include adequate legal authority to: prohibit illicit discharges; investigate suspected illicit discharges; eliminate illicit discharges, including discharges from properties not owned by or controlled by the MS4 that discharge into the MS4 system; and implement appropriate enforcement procedures and actions. Adequate legal authority consists of a currently effective ordinance, by-law, or other regulatory mechanism. For permittees authorized by the MS4-2003 permit, the ordinance, by-law, or other regulatory mechanism was a requirement of the MS4-2003 permit and was required to be effective by May 1, 2008. For new permittees the ordinance, by-law, or other regulatory mechanism shall be in place within 3 years of the permit effective date.
- b. During the development of the new components of the IDDE program required by this permit, permittees authorized by the MS4-2003 permit must continue to implement their existing IDDE program required by the MS4-2003 permit to detect and eliminate illicit discharges to their MS4.

#### 2.3.4.1. Definitions and Prohibitions

The permittee shall prohibit illicit discharges and sanitary sewer overflows (SSOs) to its MS4 and require removal of such discharges consistent with parts 2.3.4.2 and 2.3.4.4 of this permit.

An SSO is a discharge of untreated sanitary wastewater from a municipal sanitary sewer.

An illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of stormwater, except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

#### 2.3.4.2. Elimination of Illicit Discharges

- a. Upon detection of an illicit discharge, the permittee shall locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source the MS4 notify all responsible parties for any such discharge and require immediate cessation of improper disposal

practices in accordance with its legal authorities. Where elimination of an illicit discharge within 60 days of its identification as an illicit discharge is not possible, the permittee shall establish an expeditious schedule for its elimination and report the dates of identification and schedules for removal in the permittee's annual reports. The permittee shall immediately commence actions necessary for elimination. The permittee shall diligently pursue elimination of all illicit discharges. In the interim, the permittee shall take all reasonable and prudent measures to minimize the discharge of pollutants to and from its MS4.

- b. The period between identification and elimination of an illicit discharge is not a grace period. Discharges from an MS4 that are mixed with an illicit discharge are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

#### 2.3.4.3. Non-Stormwater Discharges

The permittee may presume that the sources of non-stormwater listed in part 1.4 of this permit need not be addressed. However, if the permittee identifies any of these sources as significant contributors of pollutants to the MS4, then the permittee shall implement measures to control these sources so they are no longer significant contributors of pollutants, and/or eliminate them entirely, consistent with part 2.3.4.

#### 2.3.4.4. Sanitary Sewer Overflows

- a. Upon detection of an SSO the permittee shall eliminate it as expeditiously as possible and take interim mitigation measures to minimize the discharge of pollutants to and from its MS4 until elimination is completed.
- b. The permittee shall identify all known locations where SSOs have discharged to the MS4 within the previous five (5) years. This shall include SSOs resulting, during dry or wet weather, from inadequate conveyance capacities, or where interconnectivity of the storm and sanitary sewer infrastructure allows for communication of flow between the systems. Within one (1) year of the effective date of the permit, the permittee shall develop an inventory of all identified SSOs indicating the following information, if available:
  - 1. Location (approximate street crossing/address and receiving water, if any);
  - 2. A clear statement of whether the discharge entered a surface water directly or entered the MS4;
  - 3. Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge);
  - 4. Estimated volume(s) of the occurrence;
  - 5. Description of the occurrence indicating known or suspected cause(s);
  - 6. Mitigation and corrective measures completed with dates implemented; and
  - 7. Mitigation and corrective measures planned with implementation schedules.

The permittee shall maintain the inventory as a part of the SWMP and update the inventory annually, all updates shall include the information in part 2.3.4.4.b.1-7.

- c. In accordance with Paragraph B.12 of Appendix B of this permit, upon becoming aware of an SSO to the MS4, the permittee shall provide oral notice to EPA within 24 hours. Additionally, the permittee shall provide written notice to EPA and MassDEP within five (5) days of becoming aware of the SSO occurrence and shall include the information in the updated inventory. The notice shall contain all of the information listed in part 2.3.4.4.b. Where common notification requirements for SSOs are

included in multiple NPDES permits issued to a permittee, a single notification may be made to EPA as directed in the permittee's wastewater or CSO NPDES permit and constitutes compliance with this part.

- d. The permittee shall include and update the SSO inventory in its annual report, including the status of mitigation and corrective measures implemented by the permittee to address each SSO identified pursuant to this part.
- e. The period between detection and elimination of a discharge from the SSO to the MS4 is not a grace period. Discharges from an MS4 that are mixed with an SSO are not authorized by this Permit (part 1.3.a) and remain unlawful until eliminated.

#### 2.3.4.5. System mapping

The permittee shall develop a revised and more detailed map than was required by the MS4-2003 permit. This revised map of the MS4 shall be completed in two phases as outlined below. The mapping shall include a depiction of the permittee's separate storm sewer system in the permit area. The mapping is intended to facilitate the identification of key infrastructure and factors influencing proper system operation, and the potential for illicit sanitary sewer discharges.

- a. Phase I: The system map shall be updated within two (2) years of the permit effective date to include the following information:
  - Outfalls and receiving waters (required by MS4-2003 permit)
  - Open channel conveyances (swales, ditches, etc.)
  - Interconnections with other MS4s and other storm sewer systems
  - Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
  - Waterbodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of waters report pursuant to Clean Water Act section 303(d) and 305(b)
  - Initial catchment delineations. Any available system data and topographic information may be used to produce initial catchment delineations. For the purpose of this permit, a catchment is the area that drains to an individual outfall or interconnection.
- b. Phase II: The system map shall be updated annually as the following information becomes available during implementation of catchment investigation procedures in part 2.3.4.8. This information must be included in the map for all outfalls within ten (10) years of the permit effective date:
  - Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
  - Pipes
  - Manholes
  - Catch basins
  - Refined catchment delineations. Catchment delineations shall be updated to reflect information collected during catchment investigations
  - Municipal sanitary sewer system (if available)
  - Municipal combined sewer system (if applicable).

- c. Recommended elements to be included in the system map as information becomes available:
- Storm sewer material, size (pipe diameter) and age
  - Sanitary sewer system material, size (pipe diameter) and age
  - Privately-owned stormwater treatment structures
  - Where a municipal sanitary sewer system exists, properties known or suspected to be served by a septic system, especially in high-density urban areas
  - Area where the permittee's MS4 has received or could receive flow from septic system discharges (e.g., areas with poor soils, or high ground water elevations unsuitable for conventional subsurface disposal systems)
  - Seasonal high water table elevations impacting sanitary alignments
  - Topography
  - Orthophotography
  - Alignments, dates and representation of work completed (with legend) of past illicit discharge investigations (e.g., flow isolation, dye testing, CCTV)
  - Locations of suspected, confirmed and corrected illicit discharges (with dates and flow estimates).
- d. The mapping may be produced by hand or through computer-aided methods (e.g. GIS). The required scale and detail of the map shall be appropriate to facilitate a rapid understanding of the system by the permittee, EPA and the state. In addition, the mapping shall serve as a planning tool for the implementation and phasing of the IDDE program and demonstration of the extent of complete and planned investigations and corrections. The permittee shall update the mapping as necessary to reflect newly discovered information and required corrections or modifications.
- e. The permittee shall report on the progress towards the completion of the system map in each annual report.

#### 2.3.4.6. Written Illicit Discharge Detection and Elimination Program

The IDDE program shall be recorded in a written (hardcopy or electronic) document. The IDDE program shall include each of the elements described in parts 2.3.4.7 and part 2.3.4.8, unless the permittee provides a written explanation within the IDDE program as to why a particular element is not applicable to the permittee.

Notwithstanding the permittee's explanation, EPA may at any time determine that a particular element is in fact applicable to the permittee and require the permittee to add it to the IDDE program. The written (hardcopy or electronic) IDDE program shall be completed within one (1) year of the effective date of the permit and updated in accordance with the milestones of this part. The permittee shall implement the IDDE program in accordance with the goals and milestones contained in this part.

- a. The written (hardcopy or electronic) IDDE program shall include a reference or citation of the authority the permittee will use to implement all aspects of the IDDE program.
- b. Statement of IDDE Program Responsibilities - The permittee shall establish a written (hardcopy or electronic) statement that clearly identifies responsibilities with regard to eliminating illicit discharges. The statement shall identify the lead municipal agency(ies) or department(s) responsible for implementing the IDDE Program as well as any other agencies or departments that may have responsibilities for aspects of the program (e.g., board of health responsibilities for overseeing septic system construction; sanitary sewer system staff; inspectional services for enforcing plumbing codes;

town counsel responsibilities in enforcement actions, etc.). Where multiple departments and agencies have responsibilities with respect to the IDDE program specific areas of responsibility shall be defined and processes for coordination and data sharing shall be established and documented.

- c. Program Procedures – The permittee shall include in the written IDDE program all written procedures developed in accordance with the requirements and timelines in parts 2.3.4.7 and 2.3.4.8 below. At a minimum this shall include the written procedures for dry weather outfall screening and sampling and for catchment investigations.

#### 2.3.4.7. Assessment and Priority Ranking of Outfalls/Interconnections

The permittee shall assess and priority rank the outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. This ranking will determine the priority order for screening of outfalls and interconnections pursuant to part 2.3.4.7.b, catchment investigations for evidence of illicit discharges and SSOs pursuant to part 2.3.4.8, and provides the basis for determining permit milestones of this part.

- a) Outfall/Interconnection Inventory and Initial Ranking:

An initial outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information shall be completed within one (1) year from the effective date of the permit; an updated inventory and ranking will be provided in each annual report thereafter. The inventory shall be updated annually to include data collected in connection with the dry weather screening and other relevant inspections conducted by the permittee.
- i. The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other activities under the permittee’s IDDE program.
  - An outfall means a point source as defined by 40 CFR § 122.2 as the point where the municipal separate storm sewer discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the United States and that are used to convey waters of the United States. (40 CFR § 122.26(b)(9)). However, it is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included in the inventory unless the permittee can confirm that they are free of any connections and simply convey waters of the United States.
  - An interconnection means the point (excluding sheet flow over impervious surfaces) where the permittee’s MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the United States or to another storm sewer system and eventually to a water of the United States.
- ii. The permittee shall classify each of the permittee’s outfalls and interconnections into one of the following categories:
  - Problem Outfalls: Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall

include any outfalls/interconnections where previous screening indicates likely sewer input.<sup>4</sup> Problem Outfalls need not be screened pursuant to part 2.3.4.7.b.

- High Priority Outfalls: Outfalls/interconnections that have not been classified as Problem Outfalls and that are:
    - discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds;
    - determined by the permittee as high priority based on the characteristics listed below or other available information;
  - Low Priority Outfalls: Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
  - Excluded outfalls: Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.
- iii. The permittee shall priority rank outfalls into the categories above (except for excluded outfalls), based on the following characteristics of the defined initial catchment area where information is available:
- Past discharge complaints and reports.
  - Poor receiving water quality- the following guidelines are recommended to identify waters as having a high illicit discharge potential: exceeding water quality standards for bacteria; ammonia levels above 0.5 mg/l; surfactants levels greater than or equal to 0.25 mg/l.
  - Density of generating sites- Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
  - Age of development and infrastructure – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
  - Sewer conversion – contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
  - Historic combined sewer systems – contributing areas that were once serviced by a combined sewer system, but have been separated may have a high illicit discharge potential.
  - Surrounding density of aging septic systems – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
  - Culverted streams – any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
  - Water quality limited waterbodies that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to

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<sup>4</sup> Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia  $\geq$  0.5 mg/L, surfactants  $\geq$  0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia  $\geq$  0.5 mg/L, surfactants  $\geq$  0.25 mg/L, and detectable levels of chlorine.

contain the pollutant identified as the cause of the water quality impairment.

- The permittee may also consider additional relevant characteristics, including location-specific characteristics; if so, the permittee shall include the additional characteristics in its written (hardcopy or electronic) IDDE program.

b) Dry Weather Outfall and Interconnection Screening and Sampling

All outfalls/interconnections (excluding Problem and excluded Outfalls) shall be inspected for the presence of dry weather flow within three (3) years of the permit effective date. The permittee shall screen all High and Low Priority Outfalls in accordance with their initial ranking developed at part 2.3.4.7.a.

- i. Written procedure: The permittee shall develop an outfall and interconnection screening and sampling procedure to be included in the IDDE program within one (1) year of the permit effective date. This procedure shall include the following procedures for:

- sample collection,
- use of field kits,
- storage and conveyance of samples (including relevant hold times), and
- field data collection and storage.

An example screening and sampling protocol (*EPA New England Bacterial Source Tracking Protocol*) can be found on EPA's website.

- ii. Weather conditions: Dry weather screening and sampling shall proceed only when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring.

iii. Screening requirements: For each outfall/interconnection:

1. The permittee shall record all of the following information and include it in the outfall/interconnection inventory and priority ranking:

- unique identifier,
- receiving water,
- date of most recent inspection,
- dimensions,
- shape,
- material (concrete, PVC),
- spatial location (latitude and longitude with a minimum accuracy of +/-30 feet,
- physical condition,
- indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen).

2. If an outfall/interconnection is inaccessible or submerged, the permittee shall proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results.

3. If no flow is observed, but evidence of illicit flow exists, the permittee shall revisit the

outfall during dry weather within one week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow (proceed as in iv. below).

4. Where dry weather flow is found at an outfall/interconnection, at least one (1) sample shall be collected, and:
  - a) Samples shall be analyzed at a minimum for:
    - ammonia,
    - chlorine,
    - conductivity,
    - salinity,
    - *E. coli* (freshwater receiving water) or enterococcus (saline or brackish receiving water),
    - surfactants (such as MBAS),
    - temperature, and
    - pollutants of concern<sup>5</sup>
  - b) All analyses with the exception of indicator bacteria and pollutants of concern can be performed with field test kits or field instrumentation and are not subject to 40 CFR part 136 requirements. Sampling for bacteria and pollutants of concern shall be conducted using the analytical methods found in 40 CFR §136, or alternative methods approved by EPA in accordance with the procedures in 40 CFR §136. Sampling for ammonia and surfactants must use sufficiently sensitive methods to detect those parameters at or below the threshold indicator concentrations of 0.5 mg/L for ammonia and 0.25 mg/L for surfactants. Sampling for residual chlorine must use a method with a detection limit of 0.02 mg/L or 20 ug/L.
- iv. The permittee may rely on screening conducted under the MS4-2003 permit, pursuant to an EPA enforcement action, or by the state or EPA to the extent that it meets the requirements of part 2.3.4.7.b.iii.4. All data shall be reported in each annual report. Permittees that have conducted substantially equivalent monitoring to that required by part 2.3.4.7.b as part of an EPA enforcement action can request an exemption from the requirements of part 2.3.4.7.b by submitting a written request to EPA and retaining exemption approval from EPA as part of the SWMP. Until the permittee receives formal written approval of the exemption from part 2.3.4.7.b from EPA the permittee remains subject to all requirements of part 2.3.4.7.b.
- v. The permittee shall submit all screening data used in compliance with this part in its Annual Report.
- c) Follow-up ranking of outfalls and interconnections:
  - i. The permittee's outfall and interconnection ranking (2.3.4.7.a) shall be updated to reprioritize outfalls and interconnections based on information gathered during dry weather screening (part 2.3.4.7.b).

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<sup>5</sup> Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL as indicated in Appendix F; the sample shall be analyzed for the pollutant(s) of concern identified as the cause of the impairment as specified in Appendix G

- ii. Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input<sup>6</sup> shall be considered highly likely to contain illicit discharges from sanitary sources, and such outfalls/interconnections shall be ranked at the top of the High Priority Outfalls category for investigation. At this time, permittees may choose to rank other outfalls and interconnections based on any new information from the dry weather screening.
- iii. The ranking can be updated continuously as dry weather screening information becomes available, but shall be completed within three (3) years of the effective date of the permit.

#### 2.3.4.8. Catchment Investigations

The permittee shall develop a systematic procedure to investigate each catchment associated with an outfall or interconnection within their MS4 system.

a. Timelines:

- A written catchment investigation procedure shall be developed within 18 months of the permit effective date in accordance with the requirements of part 2.3.4.8.b below.
- Investigations of catchments associated with Problem Outfalls shall begin no later than two (2) years from the permit effective date.
- Investigations of catchments associated with High and Low Priority Outfalls shall follow the ranking of outfalls updated in part 2.3.4.7.c.
- Investigations of catchments associated with Problem Outfalls shall be completed within seven (7) years of the permit effective date
- Investigations of catchments where any information gathered on the outfall/interconnection identifies sewer input<sup>7</sup> shall be completed within seven (7) years of the permit effective date.
- Investigations of catchments associated with all High- and Low-Priority Outfalls shall be completed within ten (10) years of the permit effective date.

\*For the purposes of these milestones, an individual catchment investigation will be considered complete if all relevant procedures in part 2.3.4.8.c. and 2.3.4.8.d. below have been completed.

b. A written catchment investigation procedure shall be developed that:

- i. **Identifies maps, historic plans and records, and other sources of data**, including but not limited to plans related to the construction of the storm drain and of sanitary sewers, prior work performed on the storm drains or sanitary sewers, board of health or other municipal data on septic system failures or required upgrades, and complaint records related to SSOs, sanitary sewer surcharges, and septic system breakouts. These data sources will be used in identifying system

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<sup>6</sup> Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and detectable levels of chlorine.

<sup>7</sup> Likely sewer input indicators are any of the following:

- Olfactory or visual evidence of sewage,
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and detectable levels of chlorine.

vulnerability factors within each catchment.

- ii. **Includes a manhole inspection methodology** that shall describe a storm drain network investigation that involves systematically and progressively observing, sampling (as required below) and evaluating key junction manholes (see definition in Appendix A) in the MS4 to determine the approximate location of suspected illicit discharges or SSOs. The manhole inspection methodology may either start from the outfall and work up the system or start from the upper parts of the catchment and work down the system or be a combination of both practices. Either method must, at a minimum, include an investigation of each key junction manhole within the MS4, even where no evidence of an illicit discharge is observed at the outfall. The manhole inspection methodology must describe the method the permittee will use. The manhole inspection methodology shall include procedures for dry and wet weather investigations.
  - iii. **Establishes procedures to isolate and confirm sources of illicit discharges** where manhole investigations or other physical evidence or screening has identified that MS4 alignments are influenced by illicit discharges or SSOs. These shall include isolation of the drainage area for implementation of more detailed investigations, inspection of additional manholes along the alignment to refine the location of potential contaminant sources, and methods such as sandbagging key junction manhole inlets, targeted internal plumbing inspections, dye testing, video inspections, or smoke testing to isolate and confirm the sources.
- c. Requirements for each catchment investigation associated with an outfall/interconnection:
- i. For each catchment being investigated, the permittee shall review relevant mapping and historic plans and records gathered in accordance with Part 2.3.4.8.b.i. This review shall be used to identify areas within the catchment with higher potential for illicit connections. The permittee shall identify and record the presence of any of the following specific **System Vulnerability Factors (SVFs)**:
    - History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages;
    - Common or twin-invert manholes serving storm and sanitary sewer alignments;
    - Common trench construction serving both storm and sanitary sewer alignments;
    - Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system;
    - Sanitary sewer alignments known or suspected to have been constructed with an underdrain system;
    - Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints;
    - Areas formerly served by combined sewer systems;
    - Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

EPA recommends the permittee include the following in their consideration of System Vulnerability Factors:

- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs;
- Any sanitary sewer and storm drain infrastructure greater than 40 years old;

- Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);
- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance);

The permittee shall document the presence or absence of System Vulnerability Factors for each catchment, retain this documentation as part of its IDDE program, and report this information in Annual Reports. Catchments with a minimum of one (1) System Vulnerability Factor are subject to wet weather sampling requirements of part 2.3.4.8.c.ii.2.

- ii. For each catchment, the permittee must inspect key junction manholes and gather catchment information on the locations of MS4 pipes, manholes, and the extent of the contributing catchment.

1. For all catchments

- a) Infrastructure information shall be incorporated into the permittee's mapping required at part 2.3.4.5; the permittee will refine their catchment delineation based on the field investigation where appropriate.
- b) The SVF inventory for the catchment will be updated based on information obtained during the inspection, including common (twin invert) manholes, directly piped connections between storm drains and sanitary sewer infrastructure, common weir walls, sanitary sewer underdrain connections and other structural vulnerabilities where sanitary discharges could enter the storm drain system during wet weather.
  - 1) **Where a minimum of one (1) SVF is identified based on previous information or the investigation, a wet weather investigation must be conducted at the associated outfall (see below).**
- c) During dry weather, key junction manholes<sup>8</sup> shall be opened and inspected systematically for visual and olfactory evidence of illicit connections (e.g., excrement, toilet paper, gray filamentous bacterial growth, or sanitary products present).
  - 1) If flow is observed, the permittee shall sample the flow at a minimum for ammonia, chlorine and surfactants and can use field kits for these analyses.
  - 2) Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole shall be flagged for further upstream investigation.
- d) Key junction and subsequent manhole investigations will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

2. For all catchments with a minimum of one (1) SVF identified

- a) The permittee shall meet the requirements above for dry weather screening
- b) The permittee shall inspect and sample under wet weather conditions to the extent necessary to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the

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<sup>8</sup> Where catchments do not contain junction manholes, the dry weather screening and sampling shall be considered as meeting the manhole inspection requirement. In these catchments, dry weather screenings that indicate potential presence of illicit discharges shall be further investigated pursuant to part 2.3.4.8.d. Investigations in these catchments may be considered complete where dry weather screening reveals no flow; no evidence of illicit discharges or SSOs is indicated through sampling results or visual or olfactory means; and no wet weather System Vulnerability Factors are identified.

MS4.

- 1) The permittee shall conduct at least one wet weather screening and sampling at the outfall that includes the same parameters required during dry weather screening, part 2.3.4.7.b.iii.4.
  - 2) Wet weather sampling and screening shall proceed during or after a storm event of sufficient depth or intensity to produce a stormwater discharge. EPA strongly recommends sampling during the spring (March through June) when groundwater levels are relatively high.
  - 3) The permit does not require a minimum rainfall event prior to wet weather screening. However, permittees may incorporate provisions that assist in targeting such discharges, including avoiding sampling during the initial period of discharge (“first flush”) and/or identifying minimum storm event intensities likely to trigger sanitary sewer interconnections.
- c) This sampling can be done upon completion of any dry weather investigation but must be completed before the catchment investigation is marked as complete.
- iii. All data collected as part of the dry and wet weather catchment investigations shall be recorded and reported in each annual report.
- d. Identification/Confirmation of illicit source  
Where the source of an illicit discharge has been approximated between two manholes in the permittee’s MS4, the permittee shall isolate and identify/confirm the source of the illicit discharge using more detailed methods identified in their written procedure (2.3.4.8.b.iii). For outfalls that contained evidence of an illicit discharge, catchment investigations will be considered complete upon confirmation of all illicit sources.
- e. Illicit discharge removal  
When the specific source of an illicit discharge is identified, the permittee shall exercise its authority as necessary to require its removal pursuant to part 2.3.4.2 or 2.3.4.3.
- i. For each confirmed source the permittee shall include in the annual report the following information:
    - the location of the discharge and its source(s);
    - a description of the discharge;
    - the method of discovery;
    - date of discovery;
    - date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal; and
    - estimate of the volume of flow removed.
  - ii. Within one year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening shall be conducted. The confirmatory screening shall be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening shall be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment shall be scheduled for additional investigation.

#### 2.3.4.9. Indicators of IDDE Program Progress

The permittee shall define or describe indicators for tracking program success and evaluate and report on the overall effectiveness of the IDDE program in each annual report. At a minimum the permittee shall document in each annual report:

- the number of SSOs and illicit discharges identified and removed,
- the number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure,
- all dry weather and wet weather screening and sampling results and
- the volume of sewage removed

#### 2.3.4.10 Ongoing Screening

Upon completion of all catchment investigations pursuant to part 2.3.4.8.c and illicit discharge removal and confirmation (if necessary) pursuant to paragraph 2.3.4.8.e, each outfall or interconnection shall be reprioritized for screening in accordance with part 2.3.4.7.a and scheduled for ongoing screening once every five years. Ongoing screening shall consist of dry weather screening and sampling consistent with part 2.3.4.7.b; wet weather screening and sampling shall also be required at outfalls where wet weather screening was required due to SVFs and shall be conducted in accordance with part 2.3.4.8.c.ii. All sampling results shall be reported in the permittee's annual report.

#### 2.3.4.11 Training

The permittee shall, at a minimum, annually provide training to employees involved in IDDE program about the program, including how to recognize illicit discharges and SSOs. The permittee shall report on the frequency and type of employee training in the annual report.

### 2.3.5. Construction Site Stormwater Runoff Control

**Objective:** 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. The construction site stormwater runoff control program required by this permit is a separate and distinct program from EPA's Construction General Permit in that the former is implemented by the MS4 operator to ensure that runoff from construction sites discharging to the MS4 are controlled consistent with the MS4's applicable requirements, whereas the latter is implemented by construction site operators to comply with the terms and conditions of EPA's permit (<https://www.epa.gov/npdes/2017-construction-general-permit-cgp>).

- a. Permittees shall implement and enforce a program to reduce pollutants in any stormwater runoff discharged to the MS4 from all construction activities that result in a land disturbance of greater than or equal to one acre within the regulated area. The permittee's program shall include disturbances less than one acre if that disturbance is part of a larger common plan of development or sale that would disturb one or more acres. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their existing program and modify as necessary to meet the requirements of this part.
- b. The permittee does not need to apply its construction program requirements to projects that receive a waiver from EPA under the provisions of 40 CFR § 122.26(b) (15) (i).

- c. The permittee shall develop and implement a construction site runoff control program that includes the elements in Paragraphs i. through iii. of this part:
- i. An ordinance or regulatory mechanism that requires the use of sediment and erosion control practices at construction sites. In addition to addressing sediment and erosion control, the ordinance must include controls for other wastes on construction sites such as demolition debris, litter and sanitary wastes. The ordinance or regulatory mechanisms shall provide that the permittee may, to the extent authorized by law, impose sanctions to ensure compliance with the local program. Development of an ordinance or other regulatory mechanism was a requirement of the MS4-2003 permit (See part II.B.4 and part IV.B.4). The ordinance or other regulatory mechanism required by the MS4-2003 permit shall have been effective by May 1, 2008.
  - ii. Written (hardcopy or electronic) procedures for site plan review, site inspections and enforcement of sediment and erosion control measures by the permittee. If not already existing, these procedures shall be completed within one (1) year from the effective date of the permit.
    1. The site plan review procedure shall include:
      - 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;
      - procedures for the receipt and consideration of information submitted by the public; and
      - evaluating the incorporation of Low Impact Development (LID) site planning and design strategies, unless such practices are infeasible.
    2. The site inspection and enforcement procedures shall include:
      - who is responsible for site inspections and the necessary qualifications for performing inspections, as well as who has authority to implement enforcement procedures;
      - the requirement that inspections of BMPs occur during construction of BMPs as well as after construction of BMPs to ensure they are working as described in the approved plans
      - the use of mandated inspection forms, if appropriate; and
      - procedure for tracking the number of site reviews, inspections, and enforcement actions. This tracking information shall be included as part of each annual report required by part 4.4.
  - iii. Requirements for construction site operators performing land disturbance activities within the MS4 jurisdiction that result in stormwater discharges to the MS4 to implement a sediment and erosion control program that includes BMPs appropriate for the conditions at the construction site. The program may include references to the requirements of EPA's Construction General Permit (including the development of a SWPPP) to the extent they are consistent with the program requirements of this part. The program may include references to BMP design standards in state manuals, such as the 2008 Massachusetts Stormwater Handbook<sup>9</sup>, or design standards developed by the

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<sup>9</sup> The handbook is available at: <https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards>

MS4. EPA supports and encourages the use of design standards in local programs. Examples of appropriate sediment and erosion control measures for construction sites include local requirements to:

1. Minimize the amount of disturbed area and protect natural resources;
2. Stabilize sites when projects are complete or operations have temporarily ceased;
3. Protect slopes on the construction site;
4. Protect all storm drain inlets and armor all newly constructed outlets;
5. Use perimeter controls at the site;
6. Stabilize construction site entrances and exits to prevent off-site tracking;
7. Control wastes that may be discharged, including but not limited to, discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes (these wastes may not be discharged to the MS4); and
8. Inspect stormwater controls at consistent intervals.

### 2.3.6. Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management)

Objective: The objective of this control measure is to reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites. For the purposes of this part (2.3.6.), the following definitions apply:

**site** is defined as the area extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover (e.g. repaving not covered by 2.3.6.a.ii.4.b.)

**new development** is defined as any construction activities or land alteration resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.

**redevelopment** is defined as any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development (see above).

- a. Permittees shall develop, implement, and enforce a program to address post-construction stormwater runoff from all new development and redevelopment sites that disturb one or more acres and discharge into the permittees MS4 at a minimum. Permittees authorized under the MS4-2003 permit shall continue to implement and enforce their program and modify as necessary to meet the requirements of this part.
  - i. The permittee's new development/ redevelopment program shall include sites less than one acre if the site is part of a larger common plan of development or redevelopment which disturbs one or more acre.

- ii. The permittee shall develop or modify, as appropriate, an ordinance or other regulatory mechanism within three (3) years of the effective date of the permit to contain provisions that are at least as stringent as the following:
  1. Low Impact Development (LID) site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from development sites..
  2. Stormwater management systems design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook.  
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  3. Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site<sup>10</sup>.
    - a) Average annual pollutant removal requirements in 2.3.6.a.ii.3 are achieved through one of the following methods:
      1. installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
      2. retaining the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the new development site; or
      3. meeting a combination of retention and treatment that achieves the above standards; or
      4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the new development site.
  4. Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of Total Suspended Solids (TSS) related to the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area on the site<sup>11</sup>.
    - a) Average annual pollutant removal requirements in 2.3.6.a.ii.4 above are

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<sup>10</sup> Pollutant removal is calculated based on average annual loading and not on the basis of any individual storm event

<sup>11</sup> Pollutant removal is calculated based on average annual loading and not on the basis of any individual storm event

achieved through one of the following methods:

1. installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1's BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or State-approved BMP design guidance or performance standards (e.g., State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance; or
2. retaining the volume of runoff equivalent to, or greater than, 0.8 inch multiplied by the total post-construction impervious surface area on the redeveloped site; or
3. meeting a combination of retention and treatment that achieves the above standards; or
4. utilizing offsite mitigation that meets the above standards within the same USGS HUC12 as the redevelopment site.

- b) Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions unless infeasible and are exempt from part 2.3.6.a.ii.4. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the requirements of part 2.3.6.a.ii.4..

iii. The permittee shall require, at a minimum, the submission of as-built drawings no later than two (2) years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management). The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenance shall be a part of the SWMP. The permittee shall report in the annual report on the measures that the permittee has utilized to meet this requirement.

- b. Within four (4) years of the effective date of this permit, the permittee shall develop a report assessing current street design and parking lot guidelines and other local requirements that affect

the creation of impervious cover. This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.

- c. Within four (4) years from the effective date of the permit, the permittee shall develop a report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist:
  - i. Green roofs;
  - ii. Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and
  - iii. Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The assessment should indicate if the practices are allowed in the MS4 jurisdiction and under what circumstances are they allowed. If the practices are not allowed, the permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The permittee shall report in each annual report on its findings and progress towards making the practices allowable. (Information available at:

<http://www.epa.gov/region1/npdes/stormwater/assets/pdf/AddressingBarrier2LID.pdf> and <http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid>)

- d. Four (4) years from the effective date of this permit, the permittee shall identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 through the reduction of impervious area. Properties and infrastructure for consideration shall include those with the potential for reduction of on-site impervious area (IA) as well as those that could provide reduction of off-site IA. At a minimum, the permittee shall consider municipal properties with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be modified or retrofitted. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified or retrofitted to provide reduction in frequency, volume or pollutant loads of such discharges through reduction of impervious cover.

In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and

sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.

Beginning with the fifth year annual report and in each subsequent annual report, the permittee shall identify additional permittee owned sites and infrastructure that could be retrofitted such that the permittee maintains a minimum of 5 sites in their inventory, until such a time as when the permittee has less than 5 sites remaining. In addition, the permittee shall report on all properties that have been modified or retrofitted with BMPs to mitigate IA that were inventoried in accordance with this part. The permittee may also include in its annual report non-MS4 owned property that has been modified or retrofitted with BMPs to mitigate IA.

### **2.3.7. Good House Keeping and Pollution Prevention for Permittee Owned Operations**

Objective: 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.

#### **a. Operations and Maintenance Programs**

- i. Within two (2) years from the effective date of the permit, the permittee shall develop, if not already developed, written (hardcopy or electronic) operations and maintenance procedures for the municipal activities listed below in part 2.3.7.a.ii. These written procedures shall be included as part of the SWMP.
- ii. Within two (2) year of the effective date of this permit, the permittee shall develop an inventory of all permittee owned facilities within the categories listed below. The permittee shall review this inventory annually and update as necessary.
  1. Parks and open space: Establish procedures to address the proper use, storage, and disposal of pesticides, herbicides, and fertilizers including minimizing the use of these products and using only in accordance manufacturer's instruction. Evaluate lawn maintenance and landscaping activities to ensure practices are protective of water quality. Protective practices include reduced mowing frequencies, proper disposal of lawn clippings, and use of alternative landscaping materials (e.g., drought resistant planting). Establish pet waste handling collection and disposal locations at all parks and open space where pets are permitted, including the placing of proper signage concerning the proper collection and disposal of pet waste. Establish procedures to address waterfowl congregation areas where appropriate to reduce waterfowl droppings from entering the MS4. Establish procedures for management of trash containers at parks and open space (scheduled cleanings; sufficient number). Establish procedures to address erosion or poor vegetative cover when the permittee becomes aware of it; especially if the erosion is within 50 feet of a surface water.
  2. Buildings and facilities where pollutants are exposed to stormwater runoff: This includes schools (to the extent they are permittee-owned or operated), town offices, police, and fire stations, municipal pools and parking garages and other permittee-owned or operated buildings or facilities. Evaluate the use, storage, and disposal of petroleum products and other potential stormwater pollutants. Provide employee training as necessary so that those responsible for handling these products know proper procedures. Ensure that Spill Prevention Plans are

in place, if applicable, and coordinate with the fire department as necessary. Develop management procedures for dumpsters and other waste management equipment. Sweep parking lots and keep areas surrounding the facilities clean to reduce runoff of pollutants.

3. Vehicles and Equipment: Establish procedures for the storage of permittee vehicles. Vehicles with fluid leaks shall be stored indoors or containment shall be provided until repaired. Evaluate fueling areas owned or operated by the permittee. If possible, place fueling areas under cover in order to minimize exposure. Establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters. This permit does not authorize such discharges.

iii. Infrastructure Operations and Maintenance

1. The permittee shall establish within two (2) year of the effective date of the permit a written (hardcopy or electronic) program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner to reduce the discharge of pollutants from the MS4. If the permittee has an existing program to maintain its MS4 infrastructure in a timely manner to reduce or eliminate the discharge of pollutants from the MS4, the permittee shall document the program in the SWMP.
2. The permittee shall optimize routine inspections, cleaning and maintenance of catch basins such that the following conditions are met:
  - Prioritize inspection and maintenance for catch basins located near construction activities (roadway construction, residential, commercial, or industrial development or redevelopment). Clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
  - Establish a schedule with a goal that the frequency of routine cleaning will ensure that no catch basin at anytime will be more than 50 percent full.
  - If a catch basin sump is more than 50 percent full during two consecutive routine inspections/cleaning events, the permittee shall document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the extent practicable, abate contributing sources. The permittee shall describe any actions taken in its annual report.
  - For the purposes of this part, an excessive sediment or debris loading is a catch basin sump more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
  - The permittee shall document in the SWMP and in the first annual report its plan for optimizing catch basin cleaning, inspection plans, or its schedule for gathering information to develop the optimization plan. Documentation shall include metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4. 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.
3. The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of rural uncurbed roads with no catch basins or high speed limited access highways shall be swept and/or cleaned a minimum of once per year in the spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, water quality limited or TMDL waters or other relevant factors as determined by the permittee. The permittee shall report in each annual report the number of miles cleaned or the volume or mass of material removed.

For rural uncurbed roadways with no catch basins and limited access highways, the permittee shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan within two (2) years of the effective date of the permit, and submit such plan with its year one annual report.

4. The permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters. These materials should be managed in compliance with current MassDEP policies:
  - For catch basin cleanings:  
<http://www.mass.gov/eea/agencies/massdep/recycle/regulations/management-of-catch-basin-cleanings.html>
  - For street sweepings:  
<http://www.mass.gov/eea/docs/dep/recycle/laws/stsweep.pdf>.
5. The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.
6. The permittee shall establish and implement inspection and maintenance frequencies and procedures for all stormwater treatment structures such as water quality swales, retention/detention basins, infiltration structures, proprietary treatment devices or other similar structures. All permittee-owned stormwater treatment structures (excluding catch basins) shall be inspected annually at a minimum.

- iv. The permittee shall report in the annual report on the status of the inventory required by this part and any subsequent updates; the status of the O&M programs for the permittee-owned facilities and activities in part 2.3.7.a.ii; and the maintenance activities associated with each.
- v. The permittee shall keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance activities, inspections and training required by part 2.3.7.a. The permittee shall maintain, consistent with part 4.2.a, all records associated with maintenance and inspection activities required by part 2.3.7.a.

b. Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall develop and fully implement a SWPPP for each of the following permittee-owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater as determined by the permittee. If facilities are located at the same property, the permittee may develop one SWPPP for the entire property. 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.

- i. No later than two (2) years from the effective date of the permit, the permittee shall develop and implement a written (hardcopy or electronic) SWPPP for the facilities described above. The SWPPP shall be signed in accordance with the signatory requirements of Appendix B – Subparagraph 11.
- ii. The SWPPP shall contain the following elements:
  - 1. Pollution Prevention Team  
Identify the staff on the team, by name and title. If the position is unstaffed, the title of the position should be included and the SWPPP updated when the position is filled. The role of the team is to develop, implement, maintain, and revise, as necessary, the SWPPP for the facility.
  - 2. Description of the facility and identification of potential pollutant sources  
The SWPPP shall include a map of the facility and a description of the activities that occur at the facility. The map shall show the location of the stormwater outfalls, receiving waters, and any structural controls. Identify all activities that occur at the facility and the potential pollutants associated with each activity including the location of any floor drains. These may be included as part of the inventory required by part 2.3.7.a.
  - 3. Identification of stormwater controls  
The permittee shall select, design, install, and implement the control measures detailed in paragraph 4 below to prevent or reduce the discharge of pollutants from the permittee owned facility.

The selection, design, installation, and implementation of the control measures shall be in accordance with good engineering practices and manufacturer's specifications. The permittee shall also take all reasonable steps to control or

address the quality of discharges from the site that may not originate at the facility.

If the discharge from the facility is to a water quality limited water and the facility has the potential to discharge the pollutant identified as causing the water quality limitation, the permittee shall identify the control measures that will be used to address this pollutant at the facility so that the discharge meets applicable water quality standards.

4. The SWPPP shall include the following management practices:
  - a) Minimize or Prevent Exposure: The permittee shall to the extent practicable either locate materials and activities inside, or protect them with storm-resistant coverings in order to prevent exposure to rain, snow, snowmelt and runoff (although significant enlargement of impervious surface area is not recommended). Materials do not need to be enclosed or covered if stormwater runoff from affected areas will not be discharged directly or indirectly to surface waters or to the MS4 or if discharges are authorized under another NPDES permit.
  - b) Good Housekeeping: The permittee shall keep clean all exposed areas that are potential sources of pollutants, using such measures as sweeping at regular intervals. Ensure that trash containers are closed when not in use, keep storage areas well swept and free from leaking or damaged containers; and store leaking vehicles needing repair indoors.
  - c) Preventative Maintenance: The permittee shall regularly inspect, test, maintain, and repair all equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater to receiving waters. Inspections shall occur at a minimum once per quarter.
  - d) Spill Prevention and Response: The permittee shall minimize the potential for leaks, spills, and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the permittee shall have procedures that include:
    - Preventive measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling.
    - Response procedures that include notification of appropriate facility personnel, emergency agencies, and regulatory agencies, and procedures for stopping, containing, and cleaning up leaks, spills and other releases. Measures for cleaning up hazardous material spills or leaks shall be consistent with applicable Resource Conservation and Recovery Act (RCRA) regulations at 40 CFR section 264 and 40 CFR section 265. Employees

who may cause, detect, or respond to a spill or leak shall be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the Pollution Prevention Team; and

- Contact information for individuals and agencies that shall be notified in the event of a leak, spill, or other release. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under 40 CFR section 110, 40 CFR section 117, or 40 CFR section 302, occurs during a 24-hour period, the permittee shall notify the National Response Center (NRC) at (800) 424-8802 in accordance with the requirements of 40 CFR section 110, 40 CFR section 117, and 40 CFR section 302 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency, public health or drinking water supply agencies, and owners of public drinking water supplies. Contact information shall be in locations that are readily accessible and available.
- e) Erosion and Sediment Control: The permittee shall use structural and non-structural control measures at the facility to stabilize and contain runoff from exposed areas and to minimize or eliminate onsite erosion and sedimentation. Efforts to achieve this may include the use of flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion.
- f) Management of Runoff: The permittee shall manage stormwater runoff from the facility to prevent or reduce the discharge of pollutants. This may include management practices which divert runoff from areas that are potential sources of pollutants, contain runoff in such areas, or reuse, infiltrate or treat stormwater to reduce the discharge of pollutants.
- g) Salt Storage Piles or Piles Containing Salt: For storage piles of salt or piles containing salt used for deicing or other purposes (including maintenance of paved surfaces) for which the discharge during precipitation events discharges to the permittee's MS4, any other storm sewer system, or to a Water of the US, the permittee shall prevent exposure of the storage pile to precipitation by enclosing or covering the storage piles. Such piles shall be enclosed or covered within two (2) years of the permit effective date. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. The permittee is encouraged to store piles in such a manner as not to impact surface water resources, ground water resources, recharge areas, and wells.
- h) Employee Training: The permittee shall regularly train employees who work in areas where materials or activities are exposed to stormwater, or who are responsible for implementing activities identified in the SWPPP

(e.g., inspectors, maintenance personnel), including all members of the Pollution Prevention Team. Training shall cover both the specific components and scope of the SWPPP and the control measures required under this part, including spill response, good housekeeping, material management practices, any best management practice operation and maintenance, etc. EPA recommends annual training.

The permittee shall document the following information for each training:

- The training date, title and training duration;
  - List of municipal attendees;
  - Subjects covered during training
- i) Maintenance of Control Measures: The permittee shall maintain all control measures, required by this permit in effective operating condition. The permittee shall keep documentation onsite that describes procedures and a regular schedule for preventative maintenance of all control measures and discussions of back-up practices in place should a runoff event occur while a control measure is off-line. Nonstructural control measures shall also be diligently maintained (e.g., spill response supplies available, personnel trained).

iii. The permittee shall conduct the following inspections:

1. Site Inspections: Inspect all areas that are exposed to stormwater and all stormwater control measures. Inspections shall be conducted at least once each calendar quarter. More frequent inspections may be required if significant activities are exposed to stormwater. Inspections shall be performed when the facility is in operation. At least one of the quarterly inspections shall occur during a period when a stormwater discharge is occurring.

The permittee shall document the following information for each facility inspection:

- The inspection date and time;
- The name of the inspector;
- Weather information and a description of any discharge occurring at the time of the inspection;
- Identification of any previously unidentified discharges from the site;
- Any control measures needing maintenance or repair;
- Any failed control measures that need replacement.
- Any SWPPP changes required as a result of the inspection.

If during the inspections, or any other time, the permittee identifies control measures that need repair or are not operating effectively, the permittee shall repair or replace them before the next anticipated storm event if possible, or as soon as practicable following that storm event. In the interim, the permittee shall have back-up measures in place.

The permittee shall report the findings from the Site Inspections in the annual report.

- iv. The permittee must keep a written (hardcopy or electronic) record of all required activities including but not limited to maintenance, inspections, and training required by part 2.3.7.b. The permittee shall maintain all records associated with the development and implementation of the SWPPP required by this part consistent with the requirements of part 4.2.

### **3.0. Additional Requirements for Discharges to Surface Drinking Water Supplies and Their Tributaries**

- a. Permittees which discharge to public surface drinking water supply sources (Class A and Class B surface waters used for drinking water) or their tributaries should consider these waters a priority in the implementation of the SWMP.
- b. Permittees should provide pretreatment and spill control measures to stormwater discharges to public drinking water supply sources or their tributaries to the extent feasible.
- c. Direct discharges to Class A waters should be avoided to the extent feasible.

### **4.0. Program Evaluation, Record Keeping, and Reporting**

#### **4.1. Program Evaluation**

- a. The permittee shall annually self-evaluate its compliance with the terms and conditions of this permit and submit each self-evaluation in the Annual Report. The permittee shall also maintain the annual evaluation documentation as part of the SWMP.
- b. The permittee shall evaluate the appropriateness of the selected BMPs in achieving the objectives of each control measure and the defined measurable goals. Where a BMP is found to be ineffective the permittee shall change BMPs in accordance with the provisions below. In addition, permittees may augment or change BMPs at any time following the provisions below:
  - Changes adding (but not subtracting or replacing) components or controls may be made at any time.
  - Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternative BMP may be made as long as the basis for the changes is documented in the SWMP by, at a minimum:
    - An analysis of why the BMP is ineffective or infeasible;
    - Expectations on the effectiveness of the replacement BMP; and
    - An analysis of why the replacement BMP is expected to achieve the defined goals of the BMP to be replaced.

The permittee shall indicate BMP modifications along with a brief explanation of the modification in each Annual Report.

- c. EPA or MassDEP may request the permittee to add, modify, repair, replace or change BMPs or other measures described in the annual reports as needed to satisfy the conditions of this permit.

Any changes requested by EPA or MassDEP will be in writing and may set forth the schedule for the permittee to develop the changes and may offer the permittee the opportunity to propose alternative program changes to satisfy the permit conditions..

#### **4.2. Record Keeping**

- a. The permittee shall keep all records required by this permit for a period of at least five years. EPA may extend this period at any time. Records include information used in the development of any written (hardcopy or electronic) program required by this permit, any monitoring results, copies of reports, records of screening, follow-up and elimination of illicit discharges; maintenance records; inspection records; and data used in the development of the notice of intent, SWMP, SWPPP, and annual reports. This list provides examples of records that should be maintained, but is not all inclusive.
- b. Records other than those required to be included in the annual report, part 4.4, shall be submitted only when requested by the EPA or the MassDEP.
- c. The permittee shall make the records relating to this permit, including the written (hardcopy or electronic) stormwater management program, available to the public. The public may view the records during normal business hours. The permittee may charge a reasonable fee for copying requests. The permittee is encouraged to satisfy this requirement by posting records online.

#### **4.3. Outfall Monitoring Reporting**

- a. The permittee shall monitor and sample its outfalls at a minimum through sampling and testing at the frequency and locations required in connection with IDDE screening under part 2.3.4.7.b. and 2.3.4.8.c.ii.2. The monitoring program may also include additional outfall and interconnection monitoring as determined by the permittee in connection with assessment of SWMP effectiveness pursuant to part 4.1; evaluation of discharges to water quality limited waters pursuant to part 2.2; assessment of BMP effectiveness pursuant to part 2.2 or 2.3; or otherwise.
- b. The permittee shall document all monitoring results each year in the annual report. The report shall include the date, outfall or interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results of all analyses. The annual report shall include all of this information and data for the current reporting period and for the entire permit period.
- c. The permittee shall also include in the annual report results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period where that data is being used by the permittee to inform permit compliance or program effectiveness. If such monitoring or studies were conducted on behalf of the permittee, or if monitoring or studies conducted by other entities were reported to the permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) the information was received.

#### **4.4. Annual Reports**

- a. The permittee shall submit annual reports each year of the permit term. The reporting period will be a one year period commencing on the permit effective date, and subsequent anniversaries thereof, except that the first annual report under this permit shall also cover the period from May 1, [year of

final permit effective date] to the permit effective date. The annual report is due ninety days from the close of each reporting period.

b. The annual reports shall contain the following information:

- i. A self-assessment review of compliance with the permit terms and conditions.
- ii. An assessment of the appropriateness of the selected BMPs.
- iii. The status of any plans or activities required by part 2.1 and/ or part 2.2, including:
  - Identification of all discharges that do not meet applicable water quality standards;
  - For discharges subject to TMDL related requirements, identification of specific BMPs used to address the pollutant identified as the cause of impairment and assessment of the BMPs effectiveness at controlling the pollutant (part 2.2.1. and Appendix F) and any deliverables required by Appendix F;
  - For discharges to water quality limited waters a description of each BMP required by Appendix H and any deliverables required by Appendix H.
- iv. An assessment of the progress towards achieving the measurable goals and objectives of each control measure in part 2.3 including:
  - Evaluation of the public education program including a description of the targeted messages for each audience; method of distribution and dates of distribution; methods used to evaluate the program; and any changes to the program.
  - Description of the activities used to promote public participation including documentation of compliance with state public notice regulations.
  - Description of the activities related to implementation of the IDDE program including: status of the map; status and results of the illicit discharge potential ranking and assessment; identification of problem catchments; status of all protocols described in part 2.3.4.(program responsibilities and systematic procedure); number and identifier of catchments evaluated; number and identifier of outfalls screened; number of illicit discharges located; number of illicit discharges removed; gallons of flow removed; identification of tracking indicators and measures of progress based on those indicators; and employee training.
  - Evaluation of the construction runoff management including number of project plans reviewed; number of inspections; and number of enforcement actions.
  - Evaluation of stormwater management for new development and redevelopment including status of ordinance development (2.3.6.a.ii.), review and status of the street design assessment(2.3.6.b.), assessments to barriers to green infrastructure (2.3.6.c), and retrofit inventory status (2.3.6.d.)
  - Status of the O&M Programs required by part 2.3.7.a.
  - Status of SWPPP required by part 2.3.7.b. including inspection results.
  - Any additional reporting requirements in part 3.0.

- v. All outfall screening and monitoring data collected by or on behalf of the permittee during the reporting period and cumulative for the permit term, including but not limited to all data collected pursuant to part 2.3.4. The permittee shall also provide a description of any additional monitoring data received by the permittee during the reporting period.
- vi. Description of activities for the next reporting cycle.
- vii. Description of any changes in identified BMPs or measurable goals.
- viii. Description of activities undertaken by any entity contracted for achieving any measurable goal or implementing any control measure.

c. Reports shall be submitted to EPA at the following address:

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

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

Or submitted electronically to EPA at the following email address: [stormwater.reports@epa.gov](mailto:stormwater.reports@epa.gov). After December 21, 2020 all Annual Reports must be submitted electronically.

## **5.0. Non-Traditional MS4s**

Non-traditional MS4s are MS4s owned and operated by the Commonwealth of Massachusetts, counties or other public agencies within the Commonwealth of Massachusetts, and properties owned and operated by the United States (Federal Facilities) within the Commonwealth of Massachusetts. This part addresses all non-traditional MS4s except MS4s that are owned or operated by transportation agencies, which are addressed in part 6.0 below.

### **5.1. Requirements for Non-Traditional MS4s**

All requirements and conditions of parts 1 – 4 above apply to all Non-traditional MS4s, except as specifically provided below:

#### **5.1.1. Public education**

For the purpose of this permit, the audiences for a Non-traditional MS4 include the employees, clients and customers (including students at education MS4s), visitors to the property, tenants, long term contractors and any other contractors working at the facility where the MS4 is located. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the MS4. The permittee shall document the educational topics for each target audience in the SWMP and annual reports.

### **5.1.2. Ordinances and regulatory mechanisms**

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 to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

### **5.1.3. Assessment of Regulations**

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

### **5.1.4. New Dischargers**

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of “new discharger” under 40 CFR § 122.2: “A new discharger is any building, structure, facility or installation (a) from which there is or may be a ‘discharge of pollutants’ (b) that did not commence the ‘discharge of pollutants’ at a particular ‘site’ prior to August 13, 1979; (c) which is not a ‘new source’; and (d) which never received a finally effective NPDES permit for discharges at that ‘site.’ The term “site” is defined in § 122.2 to mean “the land or water area where any ‘facility or activity’ is physically located or conducted including adjacent land used in connection with the facility or activity.”

Consistent with these definitions, a Non-traditional MS4 is a “new discharger” if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any Non-traditional MS4 facility that is a “new discharger” and discharges to a waterbody listed in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride (Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any Non-traditional MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate<sup>12</sup>. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

### **5.1.5 Dischargers Subject to Appendix F Part A.I**

Those dischargers not identified in Appendix F Table F-2 or Table F-3 discharging to waterbodies in the Charles River Watershed or to an MS4 that discharges to a waterbody in the Charles River Watershed shall coordinate with the municipality in which they are located to facilitate compliance

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<sup>12</sup> Contact MassDEP for guidance on compliance with 314 CMR 4.04

with the phosphorus reduction applicable to the municipality. In each annual report the permittee shall indicate planned phosphorus reduction activities on site and coordination progress with the municipality. In addition, the year 4 annual report shall contain the following information:

- a. Estimated current impervious area of permittee owned property,
- b. Land Use information for permittee owned property,
- c. Phosphorus removal in pounds per year for any structural BMP owned by the permittee, calculated in accordance with Appendix F Attachment 3
- d. Date of last maintenance activity for all structural BMPs for which phosphorus removal is calculated

## **6.0 Requirements for MS4s Owned or Operated by Transportation Agencies**

This part applies to all MS4s owned or operated by any state or federal transportation agency (except Massachusetts Department of Transportation –MassDOT- Highway Division, which is subject to a separate individual permit). All requirements and conditions of this permit apply with the following exceptions:

### **6.1 Public education**

For the purpose of this permit, the audiences for a transportation agency education program include the general public (users of the roadways), employees, and any contractors working at the location. The permittee may use some of the educational topics included in part 2.3.2.d. as appropriate, or may focus on topics specific to the agency. The permittee shall document the educational topics for each target audience.

### **6.2 Ordinances and regulatory mechanisms**

The transportation agency may not have authority to enact an ordinance, by-law or other regulatory mechanisms. The agency shall ensure that written agency policies or procedures are in place to address the requirements of part 2.3.4.5., part 2.3.4.6 and part 2.3.6.a.

### **6.3 Assessment of regulations**

Non-traditional MS4s do not need to meet the requirements of part 2.3.6.c.

### **6.4 New Dischargers**

New MS4 facilities are subject to additional water quality-based requirements if they fall within the definition of “new dischargers” under 40 CFR § 122.2: “A new discharger is any building, structure, facility or installation (a) from which there is or may be a ‘discharge of pollutants’ (b) that did not commence the ‘discharge of pollutants’ at a particular ‘site’ prior to August 13, 1979; (c) which is not a ‘new source’; and (d) which never received a finally effective NPDES permit for discharges at that ‘site.’ The term “site” is defined in § 122.2 to mean “the land or water area where any ‘facility or activity’ is physically located or conducted including adjacent land used in connection with the facility or activity.”

Consistent with these definitions, a new transportation MS4 is a “new discharger” if it discharges stormwater from a new facility with an entirely new separate storm sewer system that is not physically located on the same or adjacent land as an existing facility and associated system operated by the same MS4.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody listed as impaired in category 5 or 4b on the Massachusetts Integrated Report of waters listed pursuant to Clean Water Act section 303(d) and 305(b) due to nutrients (Total Nitrogen or Total Phosphorus), metals (Cadmium, Copper, Iron, Lead or Zinc), solids (TSS or Turbidity), bacteria/pathogens (E. Coli, Enterococcus or Fecal Coliform), chloride

(Chloride) or oil and grease (Petroleum Hydrocarbons or Oil and Grease), or discharges to a waterbody with an approved TMDL for any of those pollutants, is not eligible for coverage under this permit and shall apply for an individual permit.

Any transportation MS4 facility that is a “new discharger” and discharges to a waterbody that is in attainment is subject to Massachusetts antidegradation regulations at 314 CMR 4.04. The permittee shall comply with the provisions of 314 CMR 4.04 including information submittal requirements and obtaining authorization for new discharges where appropriate<sup>13</sup>. Any authorization of new discharges by MassDEP shall be incorporated into the permittee's SWMP. If an applicable MassDEP approval specifies additional conditions or requirements, then those requirements are incorporated into this permit by reference. The permittee must comply with all such requirements.

## **6.5 Dischargers Subject to Appendix F Part A.I**

Those dischargers not identified in Appendix F Table F-2 or Table F-3 discharging to waterbodies in the Charles River Watershed or to an MS4 that discharges to a waterbody in the Charles River Watershed shall coordinate with the municipality in which they are located to facilitate compliance with the phosphorus reduction applicable to the municipality. In each annual report the permittee shall indicate planned phosphorus reduction activities on site and coordination progress with the municipality. In addition, the year 4 annual report shall contain the following information:

- a. Estimated current impervious area of permittee owned property,
- b. Land Use information for permittee owned property,
- c. Phosphorus removal in pounds per year for any structural BMP owned by the permittee, calculated in accordance with Appendix F Attachment 3,
- d. Date of last maintenance activity for all structural BMPs for which phosphorus removal is calculated

---

<sup>13</sup> Contact MassDEP for guidance on compliance with 314 CMR 4.04

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## **Appendix C**

### **Notice of Intent and Authorization to Discharge Letter**

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Part I: General Conditions

**General Information**

Name of Municipality or Organization:  State:

EPA NPDES Permit Number (if applicable):

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

Fax Number:

**Other Information**

Stormwater Management Program (SWMP) Location (web address or physical location, if already completed):

**Eligibility Determination**

Endangered Species Act (ESA) Determination Complete?  Eligibility Criteria (check all that apply):  A  B  C

National Historic Preservation Act (NHPA) Determination Complete?  Eligibility Criteria (check all that apply):  A  B  C

---

Check the box if your municipality or organization was covered under the 2003 MS4 General Permit



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary

Identify the Best Management Practices (BMPs) that will be employed to address each of the six Minimum Control Measures (MCMs). For municipalities/organizations whose MS4 discharges into a receiving water with an approved Total Maximum Daily Load (TMDL) and an applicable waste load allocation (WLA), identify any additional BMPs employed to specifically support the achievement of the WLA in the TMDL section at the end of part III.

For each MCM, list each existing or proposed BMP by category and provide a brief description, responsible parties/departments, measurable goals, and the year the BMP will be employed (public education and outreach BMPs also requires a target audience). **Use the drop-down menus in each table or enter your own text to override the drop down menu.**

#### MCM 1: Public Education and Outreach

BMP Media/Category (enter your own text to override the drop down menu)	BMP Description	Targeted Audience	Responsible Department/Parties (enter your own text to override the drop down menu)	Measurable Goal	Beginning Year of BMP Implementation
Training session	Training	Industrial Shops	Environmental Office, Shop Supervisors	Conduct annual training	2019
Design & Construction Meetings	Outreach	Design & Construction Contractors	Contracting Office, Civil Engineering	No discharge of contaminated stormwater	2020







## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 3: Illicit Discharge Detection and Elimination (IDDE)

<b>BMP Categorization</b> (enter your own text to override the drop down menu)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
Storm Sewer Overflow (SSO) Inventory	Develop inventory in accordance of permit conditions	Environmental Office	Complete within 1 year of permit effective date	2019
Storm and Sewer System Map	Create Map and update	Environmental Office	Phase 1 Map within 3 years of effective date of permit and complete full system map 10 years after permit effective date	2021
Written Illicit Discharge Detection & Elimination (IDDE) Program	Create written IDDE program	Environmental Office	Complete within 3 years of the permit effective date	2021
Catchment Investigation Procedure	Create written Catchment Investigation Procedure	Environmental Office	Written investigation procedure within 3 years and execute investigation within 10 yrs of permit effective date	2021
Dry Weather Screening	Conduct in accordance with outfall Screening procedure and permit conditions	Environmental Office	Complete 3 years after permit effective date	2021
Ongoing Screening	Required to conduct Screening/Monitoring of "decommissioned" illicit connections	Environmental Office	Complete ongoing Screening once every 5 years per 2.3.4.10	2024



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 4: Construction Site Stormwater Runoff Control

<b>BMP Categorization</b> <small>(enter your own text to override the drop down menu or entered text)</small>	<b>BMP Description</b>	<b>Responsible Department/Parties</b> <small>(enter your own text to override the drop down menu)</small>	<b>Measurable Goal</b> <small>(all text can be overwritten)</small>	<b>Beginning Year of BMP Implementation</b>
Establish the Requirement for Contractors to use Erosion and Sediment Control (ESC)		Environmental Office	Complete within 3 years of the permit effective date	2021
Establish the Requirement for Contractors to control waste	Wastes include discarded building materials, concrete truck wash out, chemicals, litter, and sanitary wastes	Environmental Office	Complete within 3 years of the permit effective date	2021
CE Inspection Program	Create written procedures for inspecting contractor's site plans and inspecting the construction site	Environmental Office	Complete within 2 years of the permit effective date	2020



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 5: Post-Construction Stormwater Management in New Development and Redevelopment

<b>BMP Categorization</b> (enter your own text to override the drop down menu or entered text)	<b>BMP Description</b>	<b>Responsible Department/Parties</b> (enter your own text to override the drop down menu)	<b>Measurable Goal</b> (all text can be overwritten)	<b>Beginning Year of BMP Implementation</b>
As-built plans for on-site stormwater control	The procedures to require submission of as-built drawings and ensure long term operation and maintenance will be a part of the SWMP	Contracting Office; Civil Engineering; Construction Contractor	Require submission of as-built plans for completed projects within 3 years of project completion	2021
Target properties to reduce impervious areas	Identify at least 5 permittee-owned properties that could be modified or retrofitted with BMPs to reduce impervious areas and update annually	Environmental Office	Complete 4 years after effective date of permit and report annually on retrofitted properties	2022
Allow green infrastructure	Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist	Environmental Office	Complete 4 years after effective date of permit and implement recommendations of report	2022
Street design and parking lot guidelines	Develop a report assessing requirements that affect the creation of impervious cover. The assessment will help determine if changes to design standards for streets and parking lots can be modified to support low impact design options.	Environmental Office	Complete 4 years after effective date of permit and implement recommendations of report	2022



## Notice of Intent (NOI) for coverage under Small MS4 General Permit

### Part III: Stormwater Management Program Summary (continued)

#### MCM 6: Municipal Good Housekeeping and Pollution Prevention

<b>BMP Categorization</b> <small>(enter your own text to override the drop down menu or entered text)</small>	<b>BMP Description</b>	<b>Responsible Department/Parties</b> <small>(enter your own text to override the drop down menu)</small>	<b>Measurable Goal</b> <small>(all text can be overwritten)</small>	<b>Beginning Year of BMP Implementation</b>
O&M procedures including an Inventory for: parks and open spaces; facilities that are subject to stormwater pollution, and vehicles and equipment fueling and storage areas	Create written O&M procedures and Inventory	Environmental Office	Complete and implement 2 years after effective date of permit	2020
Stormwater Pollution Prevention Plan (SWPPP) or maintenance garages, transfer stations, and other waste-handling facilities (separate and different document from the Stormwater Management Plan - SWMP)	Create SWPPPs for maintenance garages, transfer stations, and other waste-handling facilities	Environmental Office	Complete and implement 2 years after effective date of permit	2020
Infrastructure O & M: Catch basins	Establish schedule for catch basin cleaning such that each catch basin is no more than 50% full and clean catch basins on that schedule	BOS Contractor, Civil Engineering	Clean catch basins on established schedule and report number of catch basins cleaned and volume of material moved annually	2020
Infrastructure O & M: Street Sweeping	Sweep all streets and permittee-owned parking lots in accordance with permit conditions	BOS Contractor, Civil Engineering	Sweep all streets and permittee-owned parking lots once per year in the spring	2020
Infrastructure O & M: Use and storage of salt and sand	Establish and implement a program to minimize the use of road salt	BOS Contractor, Civil Engineering	Implement salt use optimization during deicing season	2020
Infrastructure O & M: Stormwater treatment structures such as swales, detention basins, and infiltration structures.	Establish and implement inspection and maintenance procedures and frequencies	BOS Contractor, Civil Engineering	Inspect and maintain treatment structures at least annually	2020







Part IV: Notes and additional information

Use the space below to indicate the part(s) of 2.2.1 and 2.2.2 that you have identified as not applicable to your MS4 because you do not discharge to the impaired water body or a tributary to an impaired water body due to nitrogen or phosphorus. Provide all supporting documentation below or attach additional documents if necessary. Also, provide any additional information about your MS4 program below.

Westover Air Reserve Base is currently covered under an additional stormwater permit called Multi Sector General Permit (Permit Number MAR052002) and implements that associated Stormwater Pollution Prevention Plan.

Part V: Certification

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that 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.*

Name:

Title:

Signature:  Digitally signed by  
DURHAM.DERIN.S.1058193743  
Date: 2018.09.26 11:31:56 -04'00'

Date:

*[To be signed according to Appendix B, Subparagraph B.11, Standard Conditions]*

Note: When prompted during signing, save the document under a new file name



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 1  
5 POST OFFICE SQUARE, SUITE 100  
BOSTON, MA 02109-3912

**VIA EMAIL**

February 14, 2019

DERIN S. DURHAM, Colonel, USAF  
COMMANDER

And;

Champanine Saviengvong  
Environmental Engineer  
250 Patriot Avenue  
Chicopee, MA. 01022  
champanine.saviengvong@us.af.mil

Re: National Pollutant Discharge Elimination System Permit ID #: MAR042051, Westover Air Reserve Base

Dear Champanine Saviengvong:

The 2016 NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts (MS4 General Permit) is a jointly issued EPA-MassDEP permit. Your Notice of Intent (NOI) for coverage under this MS4 General Permit has been reviewed by EPA and appears to be complete. You are hereby granted authorization by EPA and MassDEP to discharge stormwater from your MS4 in accordance with the applicable terms and conditions of the MS4 General Permit, including all relevant and applicable Appendices. This authorization to discharge expires at midnight on **June 30, 2022**.

For those permittees that certified Endangered Species Act eligibility under Criterion C in their NOI, this authorization letter also serves as EPA's concurrence with your determination that your discharges will have no effect on the listed species present in your action area, based on the information provided in your NOI.

As a reminder, your first annual report is due by **September 30, 2019** for the reporting period from May 1, 2018 through June 30, 2019.

Information about the permit and available resources can be found on our website: <https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit>. Should you have any questions regarding this permit please contact Newton Tedder at [tedder.newton@epa.gov](mailto:tedder.newton@epa.gov) or (617) 918-1038.

Sincerely,

A handwritten signature in blue ink that reads "Thelma Murphy". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Thelma Murphy, Chief  
Stormwater and Construction Permits Section  
Office of Ecosystem Protection  
United States Environmental Protection Agency, Region 1

and;

A handwritten signature in black ink that reads "Lealdon Langley". The signature is cursive and somewhat stylized, with a prominent loop at the end.

Lealdon Langley, Director  
Wetlands and Wastewater Program  
Bureau of Water Resources  
Massachusetts Department of Environmental Protection

**Appendix D**  
**SWMP Checklist**

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## SWMP Checklist

### Activities during Year 1 – Complete by 30 June 2019

- Complete SSO Inventory (BMP 3c; Section 4.3)
- Complete Phase I Mapping (BMP 3d; Section 4.3)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Complete and Submit 1<sup>st</sup> Annual Report (30 September 2019)

### Activities during Year 2 – Complete by 30 June 2020

- Post SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Complete Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)**
- Complete and Submit 2<sup>nd</sup> Annual Report (30 September 2020)

### Activities during Year 3 – Complete by 30 June 2021

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Implement IDDE Legal Authority (BMP 3a; Section 4.3)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Implement Sediment and Erosion Control Legal Authority (BMP 4a; Section 4.4)
- Implement Inspections and Enforcement of ESC Measures (BMP 4b; Section 4.4)
- Implement Site Plan Review Procedures (BMP 4c; Section 4.4)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)**
- Implement Post Construction Stormwater Management Policy (BMP 5b; Section 4.5)**
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 3<sup>rd</sup> Annual Report (30 September 2021)

### Activities during Year 4 – Complete by 30 June 2022

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Develop IDDE Written Procedures (BMP 3b; Section 4.2; First dry weather screening 2024)**
- Complete Initial Outfall Rankings (BMP 3b; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Develop Written O&M Procedures for Parks and Open Spaces (BMP 6a; Section 4.6)

- Develop Written O&M Procedures for Buildings and Facilities (BMP 6b; Section 4.6)
- Develop Written Vehicle and Equipment Storage Procedures (BMP 6c; Section 4.6)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Develop Written O&M Procedures for Stormwater Infrastructure (BMP 6e; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Develop SWPPP (BMP 6h; Section 4.6)
- Complete Nitrogen Source Identification Report (BMP 7a; Section 5.1)**
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 4<sup>th</sup> Annual Report (30 September 2022)
- Pay attention to MS4 Permit Renewal**

#### Activities during Year 5 – Complete by 30 June 2023

- Send Industrial Users Public Education Message (BMP 1a; Section 4.1)
- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Begin Catchment Investigations on Problem Outfalls (BMP 3b; Section 4.3)**
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)**
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Compile List of Five Retrofit Opportunities (BMP 5e; Section 4.5)**
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Complete Structural BMP Evaluation of Retrofit Opportunities (BMP 7b; Section 5.1)**
- Complete Planned Structural BMPs List (BMP 7c; Section 5.1)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 5<sup>th</sup> Annual Report (30 September 2023)

#### Activities during Year 6 – Complete by 30 June 2024

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Complete Dry Weather Screening and Sampling (BMP 3b; Section 4.3)**
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Compile Street Design and Parking Lot Guidelines Reports (BMP 5b; Section 4.5)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Complete Installation of Structural BMP Demonstration Project (BMP 7d; Section 5.1)**
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 6<sup>th</sup> Annual Report (30 September 2024)

#### Activities during Year 7 – Complete by 30 June 2025

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)

- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Begin Catchment Investigations on High-Priority and Low-Priority Outfalls (BMP 3b; Section 4.3)**
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 7<sup>th</sup> Annual Report (30 September 2025)

**Activities during Year 8 – Complete by 30 June 2026**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 8<sup>th</sup> Annual Report (30 September 2026)

**Activities during Year 9 – Complete by 30 June 2027**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 9<sup>th</sup> Annual Report (30 September 2027)

**Activities during Year 10 – Complete by 30 June 2028**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete Catchment Investigations on Problem Outfalls (BMP 3b; Section 4.3)**
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)

- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 10<sup>th</sup> Annual Report (30 September 2028)

**Activities during Year 11 – Complete by 30 June 2029**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Conduct 2<sup>nd</sup> Round Dry Weather Screening and Sampling (BMP 3b; Section 4.3)**
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 11<sup>th</sup> Annual Report (30 September 2029)

**Activities during Year 12 – Complete by 30 June 2030**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)
- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 12<sup>th</sup> Annual Report (30 September 2030)

**Activities during Year 13 – Complete by 30 June 2031**

- Post updated SWMP Online for Public Access (BMP 2a; Section 4.2)
- Solicit Comments from Public (BMP 2b; Section 4.2)
- Post Annual Report Online for Public Access (BMP 2a; Section 4.2)
- Complete Catchment Investigations on High-Priority and Low-Priority Outfalls (BMP 3b; Section 4.3)**
- Update SSO Inventory (BMP 3c; Section 4.3)
- Complete Phase II Mapping (BMP 3d; Section 4.3)**
- Complete IDDE Training to Responsible Employees (BMP 3e; Section 4.3)
- Track and Document Site Plan Reviews, Construction Site Inspections, and Construction Site Enforcement Actions (BMP 4c; Section 4.4)
- Complete and Document Catch Basin Cleanings (BMP 6d; Section 4.6)
- Complete and Document Stormwater Structure Inspections and Maintenance (BMP 6e; Section 4.6)

- Complete and Document Street and Parking Lot Sweepings (BMP 6f; Section 4.6)
- Update Structural BMP Tracking/Nitrogen Calculations (BMP 7e; Section 5.1)
- Complete and Submit 13<sup>th</sup> Annual Report (30 September 2031)

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## **Appendix E**

### **Endangered Species Documentation**

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# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

New England Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087  
<http://www.fws.gov/newengland>

January 8, 2018

To Whom It May Concern:

This project was reviewed for the presence of federally listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

<http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm> (accessed January 2018)

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact David Simmons of this office at 603-227-6425 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman  
Supervisor  
New England Field Office

## ZAHARIAS, ANTHONY M GS-11 USAF AFRC 439 MSG/CEV

---

**From:** Tur, Maria <maria\_tur@fws.gov>  
**Sent:** Wednesday, March 01, 2017 5:28 PM  
**To:** ZAHARIAS, ANTHONY M GS-11 USAF AFRC 439 MSG/CEV  
**Subject:** Re: NLEB Streamlined Consultation Form\_Westover ARB

Hello Tony,

I did review the form and everything looks fine. For future reference, we don't reply to these forms unless there's an issue. If you don't hear from us within 30 days of submitting the form, you are set to go.

Thank you for checking in. Please contact me if you need further assistance.

Maria E. Tur  
U.S. Fish and Wildlife Service  
New England Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301  
Phone (603) 223-2541 x6419  
FAX (603) 223-0104

<http://www.fws.gov/newengland/>

On Wed, Mar 1, 2017 at 4:22 PM, ZAHARIAS, ANTHONY M GS-11 USAF AFRC 439 MSG/CEV <anthony.zaharias@us.af.mil <mailto:anthony.zaharias@us.af.mil> > wrote:

Maria,

Have you had a chance to review our NLEB 4d Consultation Form that we submitted on January 13th? I'm hoping you can give us a timeframe as to when we might hear back from you. Thank you.

Tony Zaharias  
439 MSG/CEV  
Westover ARB  
413.557.2436

-----Original Message-----

From: ZAHARIAS, ANTHONY M GS-11 USAF AFRC 439 MSG/CEV  
Sent: Friday, January 13, 2017 11:53 AM  
To: 'Maria\_Tur@fws.gov <mailto:Maria\_Tur@fws.gov>' <Maria\_Tur@fws.gov <mailto:Maria\_Tur@fws.gov> >  
Cc: MORIARTY, JOHN B GS-12 USAF AFRC 439 CE/CEV <john.moriarty.1@us.af.mil <mailto:john.moriarty.1@us.af.mil> >  
Subject: NLEB Streamlined Consultation Form\_Westover ARB

Maria,

Attached is a NLEB Streamlined Consultation form. We are hoping to remove

trees in the near future that constitute airfield obstructions in accordance with FAA regulations. My understanding is that we need to submit this form prior to commencing any work. Please let me know if you need any additional information.

Thank you,

Tony Zaharias  
439 MSG/CEV  
Westover ARB  
413.557.2436

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## **Appendix F**

### **Public Education Messages**

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# ***STORM WATER***

## **POLLUTION PREVENTION TRAINING**



Pursuant to the Clean Water Act

# Training is required by LAW for those who affect Stormwater.

---

1987 Clean Water Act requires



Westover to be covered under NPDES Stormwater Permits, which require



Stormwater P2 Plans, which require



Training



THINK PICKING UP SPIKE'S  
POOP IS GROSS?  
TRY SWIMMING IN IT.

# Connecticut River Cleanup Committee

---

When you leave dog poop on the ground - or throw it down a storm drain - the rain carries Spike's mess into storm drains and straight to our rivers, beaches and bays making them unsafe for swimming.

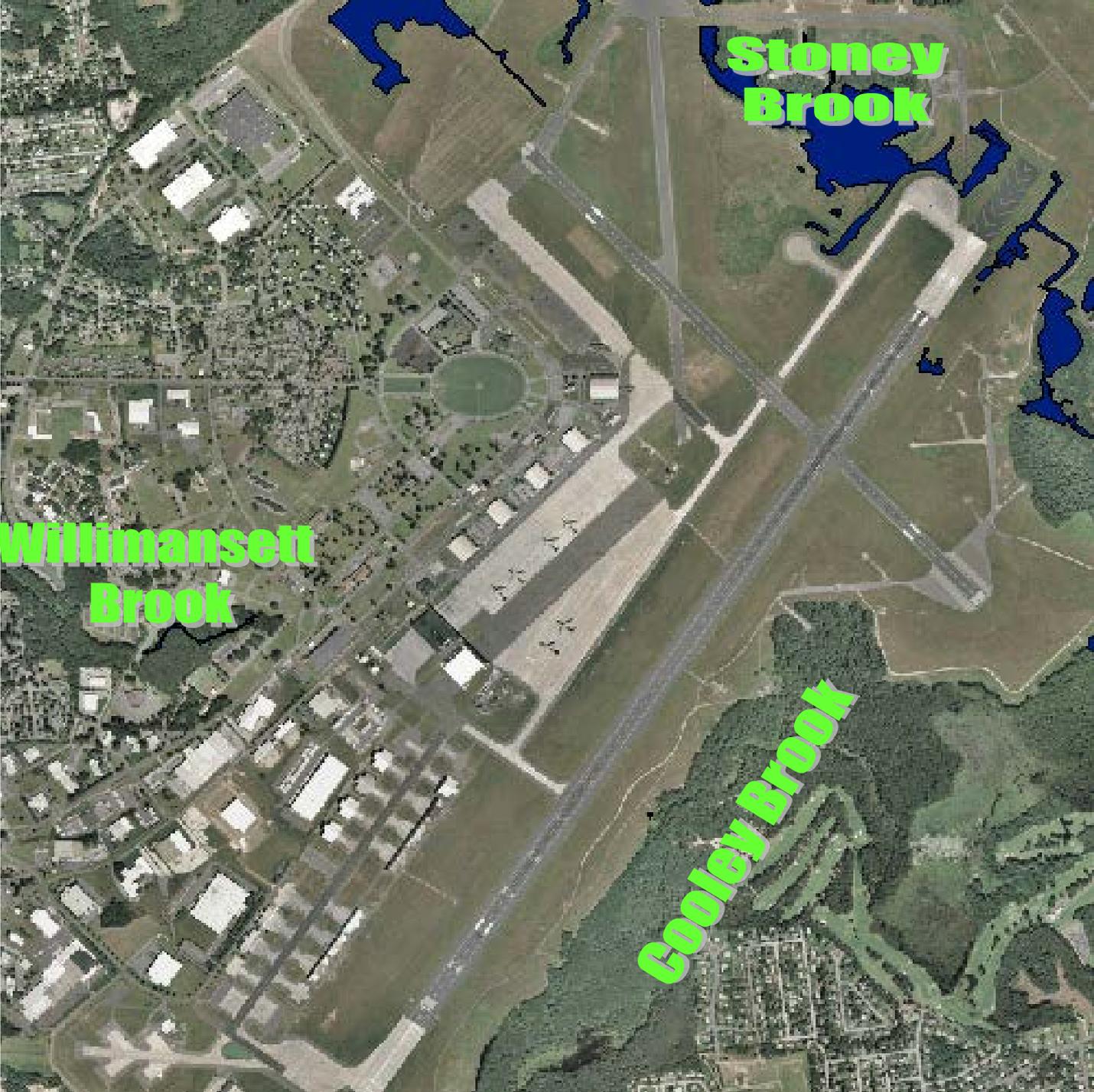
Help keep our waters blue...pick up after your dog and throw the waste in the trash.

[www.ThinkAgainThinkBlue.org](http://www.ThinkAgainThinkBlue.org)



# Sources of stormwater pollution at Westover





**Stoney Brook**

**Willimansett Brook**

**Cooley Brook**



# Good Housekeeping Practices in Maintenance Areas

---

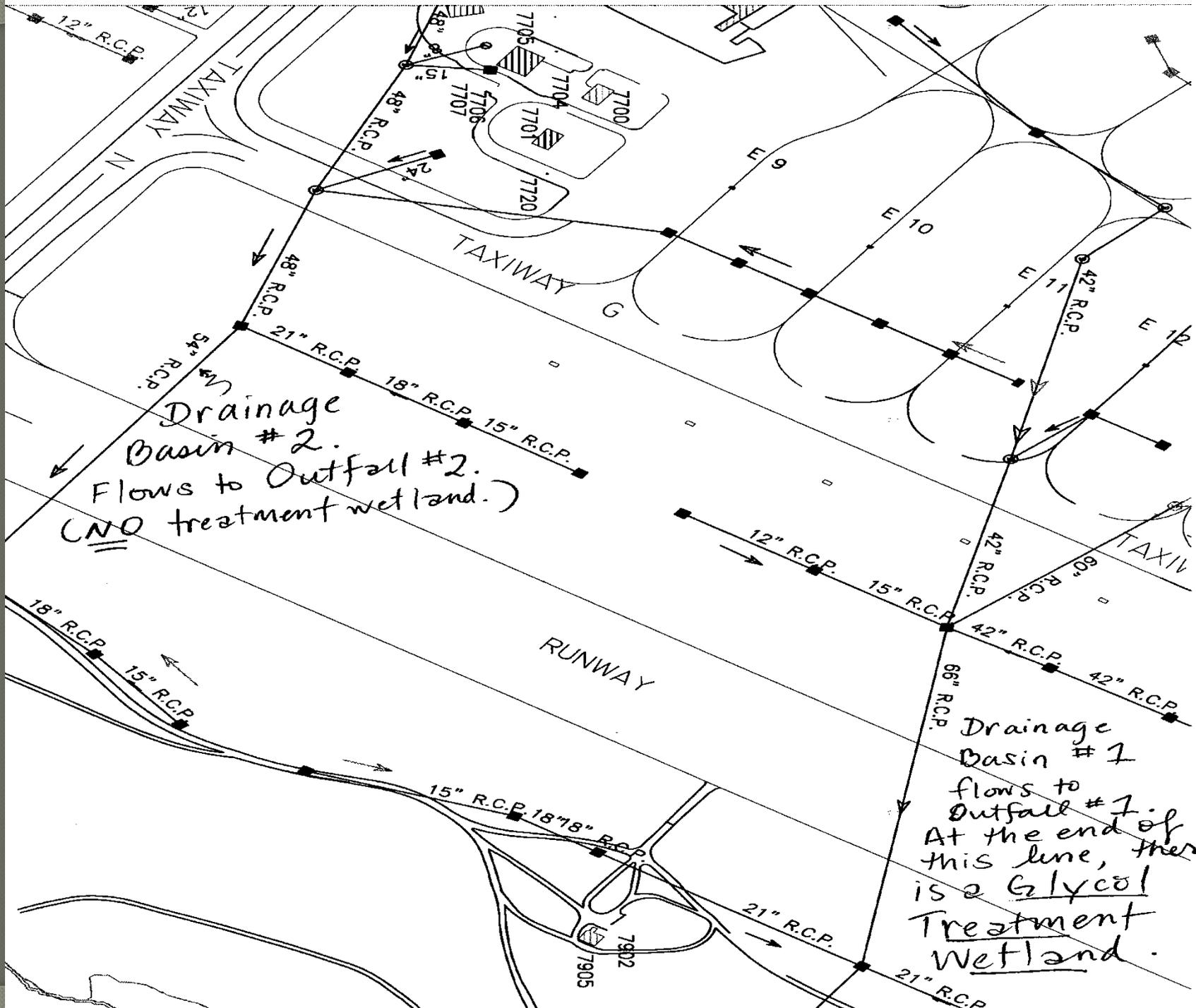
- Perform maintenance activities indoors if possible
- Use DRY cleanup methods for SPILLS. Maintain dry, clean floors and ground surfaces by using brooms, shovels, vacuum cleaners, or cleaning machines (**do not hose down floors with water**).
- Store hazardous waste containers in appropriate accumulation area
- Make sure vehicles, equipment, and machinery are working properly. **Perform maintenance on vehicles and equipment prone to leaking.**

# Best Management Practices for AIRCRAFT DEICING

- Inspect deicing areas to ensure discharge of deicing fluid runoff is minimized – **notice locations of storm drains.**
- Preferential use of the Pull-Through Hangar should be first consideration (rather than the Echos) and conducted as much as practical to prevent snow/ice accumulation on scheduled flying aircraft and to minimize use of de-icing chemicals. **\*\*THIS MEANS: USE 7040 FOR THE INDOOR HEAT – NEVER DEICE WITH CHEMICALS INSIDE ANY HANGAR, 7040 OR 7000.**
- At this time, our Chicopee Sanitary Permit DOES NOT ALLOW chemical deicing inside any Hangars. At such time as the prohibition changes, Environmental Flight will give the update.

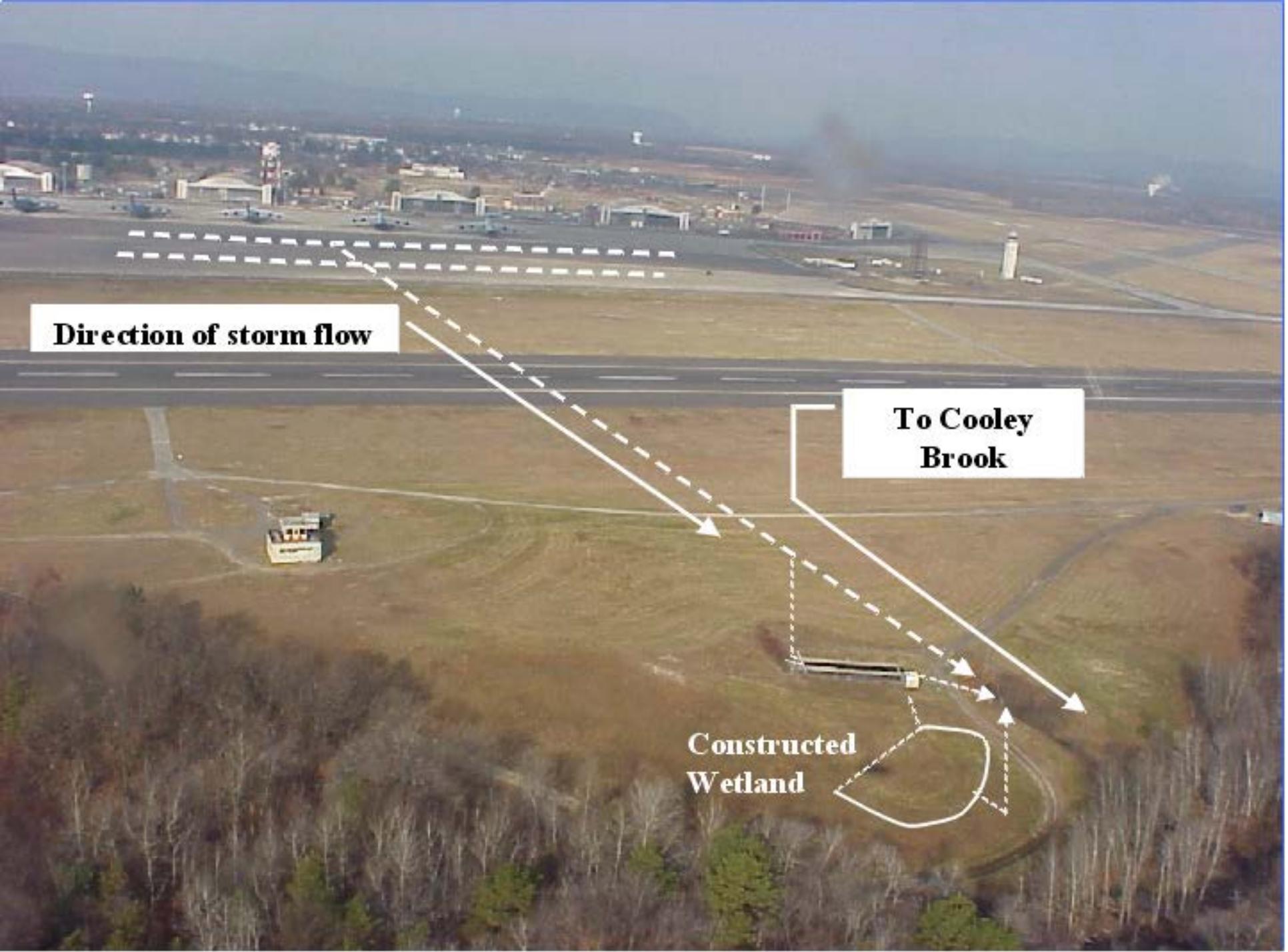
# Best Management Practices for AIRCRAFT DEICING

- If necessary to deice outdoors, perform deicing on Echos 1-8 and Echos 12-14, which are areas that drain to an OWS and then to an engineered treatment wetland. Echos 9 (RISO), 10, and 11 are not preferred deicing locations, however if best attempt to use another Echo doesn't succeed then ensure event is logged.
- Pad 23 and Pad 05 should be considered as preferable deicing locations, rather than Pad 33 which has drains tying it directly to the storm water system.
- Minimize Over Spray
- **Complete logs for CEV, please don't forget the time of day of deicing event.**



Drainage Basin #2.  
 Flows to Outfall #2.  
 (NO treatment wetland.)

Drainage Basin #7  
 flows to Outfall #7.  
 At the end of this line, there is a Glycol Treatment Wetland.



**Direction of storm flow**

**To Cooley Brook**

**Constructed Wetland**

# Vehicle Washing Methods



**This is good**

Using commercial car wash facilities can reduce stormwater impacts caused by car washing because such facilities must treat their wash water discharges before release



## ***APPROVED Wash Racks at Westover***

**1530 – 42 APS**

**5305 – Industrial Gate Vehicle Inspection Bldg**

**7040 – Pull-Through Hangar**

**7071 – Hangar 9, AGE**

**7073 – Hangar 5, Roads & Grounds / Vehicle Maintenance**

**7084 – Fire Department**



## WASHRACKS

- It is a violation of Federal and State laws and AF regulations to discharge any oil or hazardous waste into any type of floor drain. Prohibited substances include: waste fuel, oil, grease, oily waste, solvents and cleaning compounds.
- Motor Oil empty containers should not be tossed in garbage can.
- Keep Washracks free of hazardous waste

*Purge oils from unused equipment being parked INDOORS!*



**Purge oils from unused equipment being stored OUTDOORS!**



**Continuously perform VISUAL INSPECT**



# Can anything be done here?

- Clean up leaks
- Repair vehicle
- Use a drip pan while waiting

**Purge oils from VEHICLES stored outdoors awaiting next Deicing Season.**



# What to do if there is a spill...

## 2-Minute Spill- Response Drill

- **Never ignore a spill no matter how minor!!** Either **CLEAN IT UP** or call **Fire Department**.
- **Safety First** - Don't Take Risks
- **Stop** the Spill at its Source
- **Protect** Drains and Storm Sewers
- **Spread** Absorbent Material
- **Dispose** of the Spilled Material Properly. For coordination, call CEV ext. 3331 (Mr. Al Couture)

# POCs

- Storm Water Program Manager –  
Champanine Saviengvong, Extension 3951
- Environmental Engineering Chief – Mr. Jack  
Moriarty, Extension 2434





**439<sup>TH</sup> MXS Paint Booth**  
**Pull Thru Hangar, Bldg 7040**



**ENVIRONMENTAL MANAGEMENT SYSTEM**  
**STATUS: MAINTENANCE**

**ENVIRONMENTAL ASPECTS**

**OPERATIONAL CONTROLS**  
 PHYSICAL, ENGINEERING, ADMINISTRATIVE



**HAZARDOUS MATERIALS**

APPROVED CABINET USED FOR FLAMMABLE MATERIALS. PURCHASES ARE RECORDED IN EESOH-MIS DATABASE. FOLLOW INSTRUCTIONS IN CURRENT MSDS MAINTAINED ONSITE.



**AIR - VOC/ PARTICULATE MATTER**

HIGH EFFICIENCY FILTERS (PARTICULATE MATTER). HVLP PAINT GUNS USED IN PAINT BOOTH (VOC). COATING AND THINNER USE IS RECORDED IN PAINT BOOTH LOG DAILY. MADEP VOC COMPLIANT COATINGS USED IN PAINT BOOTH.



**HAZARDOUS WASTE**

SATELLITE ACCUMULATION POINT. DRUMS IN SAP ARE LABELED AND CLOSED AT ALL TIMES. SAP INSPECTED AND DOCUMENTED AT LEAST EVERY 7 DAYS.



**AIR - VOC AND HAZARDOUS WASTE**

COLD SOLVENT PAINT GUN WASHER. KEEP LID CLOSED WHENEVER NOT CLEANING PAINT GUNS. TRANSFER USED THINNER TO SAP FOR TURN-IN TO CEV.

**Responsible Individuals Assoc. with this ASPECT/PROCESS**

439 MXS/MXMA: SMSGT ROBERT VEY - 413-557-2036

439 MSG/CEV: AL COUTURE - 413-557-3331; GAIL MILLER - 413-557-3036

FAX: 2897

**Regulations and Permits Associated with this ASPECT/PROCESS**

310 CMR 30.000 (hazardous waste); 310 CMR 7.00 (air emissions)

**EMS Policy Reminder – Comply, Conserve, Prevent Pollution, Improve**

For copy of EMS Policy log on to:

<https://eis.af.mil/cs/edash/AFRC/westover/Pages%20%20EMS/02%20Environmental%20Policy.aspx>

For copy of Westover SPCC Plan log on to:

<https://eis.af.mil/cs/edash/AFRC/westover/Pages%20%20EMS/11%20Emergency%20Response.aspx>

and for full details of Westover EMS at EDASH website:

<https://eis.af.mil/cs/edash/AFRC/westover/default.aspx>

The key elements of an **Environmental Management Plan** for operations that have significant aspects that are well controlled will be summarized on a poster like this to be posted near the worksite.

**Key Elements include:**

- Status = Maintenance
- Environmental Aspects
- Operational Controls
- Responsible Individuals
- Major Regulations
- EMS Policy reminder
- Location of important EMS documents

## **Appendix G**

### **Sanitary Sewer Overflow Inventory**

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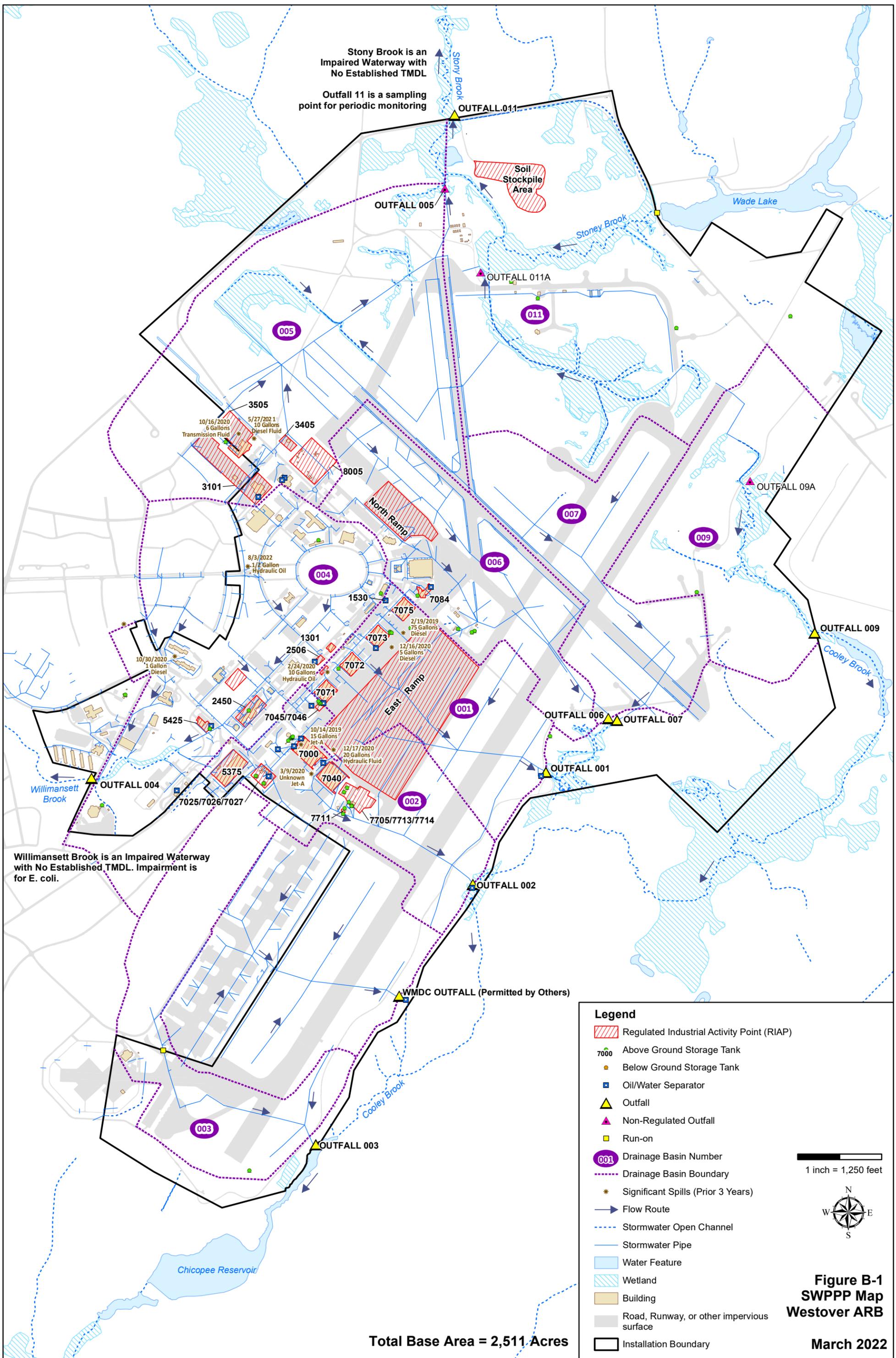


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## **Appendix H**

### **Mapping of MS4 System**

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Stony Brook is an Impaired Waterway with No Established TMDL  
 Outfall 11 is a sampling point for periodic monitoring

Willimansett Brook is an Impaired Waterway with No Established TMDL. Impairment is for E. coli.

Total Base Area = 2,511 Acres

**Legend**

- Regulated Industrial Activity Point (RIAP)
- Above Ground Storage Tank
- Below Ground Storage Tank
- Oil/Water Separator
- Outfall
- Non-Regulated Outfall
- Run-on
- 001 Drainage Basin Number
- Drainage Basin Boundary
- Significant Spills (Prior 3 Years)
- Flow Route
- Stormwater Open Channel
- Stormwater Pipe
- Water Feature
- Wetland
- Building
- Road, Runway, or other impervious surface
- Installation Boundary

1 inch = 1,250 feet

**Figure B-1  
SWPPP Map  
Westover ARB**

**March 2022**

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**Appendix I**  
**IDDE Program**

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**Westover Air Reserve Base  
MS4 (Municipal Separate Storm Sewer System)  
Illicit Discharge Detection and Elimination Plan**

*for coverage under the*

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

*Prepared for*

Headquarters, Air Force Reserve Command  
HQ AFRC/CEVQ  
255 Richard Bay Boulevard  
Robbins Air Force Base, Georgia 31098-6137

*Prepared by*

EA Engineering, Science, and Technology, Inc., PBC\*  
301 Metro Center Boulevard, Suite 102  
Warwick, Rhode Island 02886

June 2022  
Version: DRAFT  
EA Project No. 62943.12

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## LIST OF ACRONYMS AND ABBREVIATIONS

%	Percent
°C	Degrees Celsius
µS/cm	MicroSiemens per centimeter
AFMAN	Air Force Manual
AFRC	Air Force Reserve Command
ARB	Air Reserve Base
BCE	Base Civil Engineer
BMP	Best management practice
CFR	Code of Federal Regulations
cfu	Colony forming unit(s)
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
H <sub>2</sub> SO <sub>4</sub>	Sulfuric acid
ICP	Inductively coupled plasma
ID	Identification
IDDE	Illicit Discharge Detection and Elimination
MassDEP	Massachusetts Department of Environmental Protection
mg/L	Milligram(s)
MPN	Most probable number
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-section general permit
NA	Not applicable
No.	Number
NPDES	National Pollutant Discharge Elimination System
Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Sodium thiosulfate
NO <sub>3</sub>	Nitrate
PPE	Personal protective equipment
SM	Standard Method
SSO	Sanitary sewer overflow
SVF	System vulnerability factor
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan

**LIST OF ACRONYMS AND ABBREVIATIONS (continued)**

TMDL Total maximum daily load

Westover ARB Westover Air Reserve Base

## 1. INTRODUCTION

This report describes the site-specific procedures and methods to identify, address, and monitor illicit discharges to the Westover Municipal Separate Storm Sewer System (MS4) stormwater system. Some sections of this report are based on the template produced by the Central Massachusetts Regional Stormwater Coalition to develop Illicit Discharge Detection and Elimination (IDDE) Program Plans (2016). This report is an appendix to the facility Stormwater Management Program (SWMP) that addresses MS4 requirements for identification and prioritization of outfalls with potential illicit discharges, as well as techniques for locating and addressing illicit discharges.

### 1.1 MS4 PROGRAM

This IDDE Plan has been developed by EA Engineering, Science, and Technology Inc., PBC (EA) for Westover Air Reserve Base to address the requirements of the U.S. Environmental Protection Agency's (EPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small MS4 in Massachusetts, hereafter referred to as the MS4 Permit.

The 2016 Massachusetts MS4 Permit requires that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

1. Public education and outreach
2. Public involvement and participation
3. 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 for permittee owned operations.

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its MS4 and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document. This IDDE Plan has been prepared to address this requirement.

### 1.2 ILLICIT DISCHARGES

An illicit discharge is any discharge to a drainage system that is not composed entirely of stormwater, with the exception of discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the MS4) and discharges resulting from fire-fighting activities.

Illicit discharges may take a variety of forms. Illicit discharges may enter the drainage system through direct or indirect connections. Direct connections may be relatively obvious, such as cross-connections of sewer services to the storm drain system. Indirect illicit discharges may be more difficult to detect or address, such as failing septic systems that discharge untreated sewage to a ditch within the MS4, or a sump pump that discharges contaminated water on an intermittent basis.

Some illicit discharges are intentional, such as dumping used oil (or other pollutant) into catch basins, a contractor illegally tapping a new sewer lateral into a storm drainpipe to avoid the costs of a sewer connection fee and service, and illegal dumping of yard wastes into surface waters.

Some illicit discharges are related to the unsuitability of original infrastructure to the modern regulatory environment. Examples of illicit discharges in this category include connected floor drains in old buildings, as well as sanitary sewer overflows (SSOs) that enter the drainage system. Sump pumps legally connected to the storm drain system may be used inappropriately, such as for the disposal of floor wash water or old household products, in many cases due to a lack of understanding on the part of the building owner.

Elimination of some discharges may require substantial costs and efforts, such as funding and designing a project to reconnect sanitary sewer laterals. Others, such as improving self-policing of dog waste management, can be accomplished by outreach in conjunction with the minimal additional cost of dog waste bins and the municipal commitment to disposal of collected materials on a regular basis.

Regardless of the intention, when not addressed, illicit discharges can contribute high levels of pollutants, such as heavy metals, toxics, oil, grease, solvents, nutrients, and pathogens to surface waters.

### **1.3 ALLOWABLE NON-STORMWATER DISCHARGES**

Allowable non-stormwater discharges are discussed in Section 4.3.1 of the SWMP. If any of the allowable non-stormwater discharges are determined to be significant contributors of pollutants to the MS4, then they are regarded as an illicit discharge and must be addressed using procedures in the IDDE Plan.

Certain discharge of industrial stormwater to the MS4 is authorized under the EPA NPDES multi-section general permit (MSGP) for Stormwater Discharges Associated with Industrial Activity (Permit No. MAR050000). For information regarding these authorized discharges and best management practices (BMPs) used to prevent stormwater pollution, refer to Westover Air Reserve Base's (Westover ARB's) Stormwater Pollution Prevention Plan (SWPPP) and the MSGP.

### **1.4 RECEIVING WATERS AND IMPAIRMENTS**

Table 1-1 lists the impaired waters within the boundaries of Westover ARB's regulated area based on the 2020 Massachusetts Integrated List of Waters produced by Massachusetts Department of

Environmental Protection (MassDEP) every 2 years. Impaired waters are water bodies that do not meet water quality standards for one or more designated use(s) such as recreation or aquatic habitat. Information on discharges and receiving water bodies is located in Section 3 of the SWMP. There is not an established total maximum daily load (TMDL) for *E. coli*, non-native aquatic plants, or turbidity. Nitrogen impairment is not listed on the Massachusetts list of impaired waters; however, the entire site area is within the watershed of Long Island Sound, which has an approved TMDL for nitrogen; and therefore, the facility must complete additional requirements to mitigate and track nitrogen removal.

**Table 1-1. Impaired Receiving Waters**

Water Body Name	Segment ID	Category	Impairment(s)
Cooley Brook	MA36-38	Category 2	Total nitrogen
Willimansett Brook	MA34-60	Category 5	<i>E. coli</i> and total nitrogen
Stoney Brook	MA34-19	Category 5	Non-native aquatic plants, <i>E. coli</i> , turbidity, and total nitrogen

Notes:

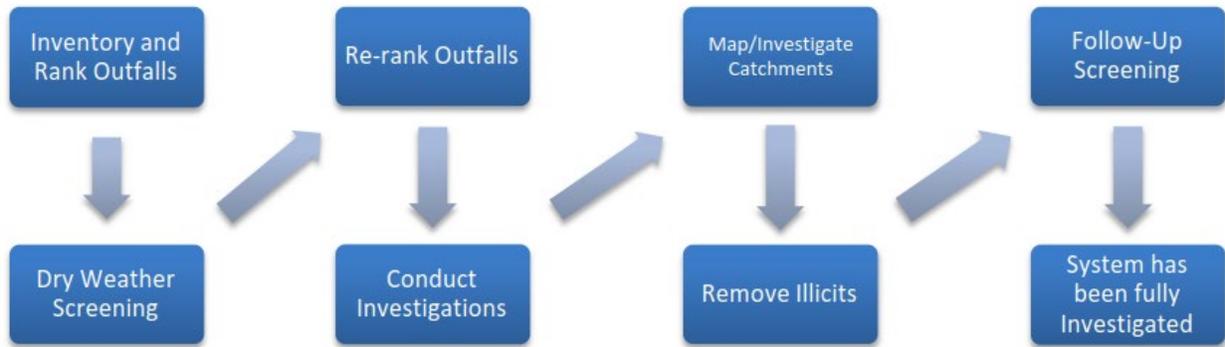
Category 5 Waters – impaired water bodies that require a TMDL.

## 1.5 IDDE PROGRAM GOALS, FRAMEWORK, AND TIMELINE

The goals of the IDDE program are to find and eliminate illicit discharges to municipal separate storm sewer system and to prevent illicit discharges from happening in the future. The program consists of the following major components as outlined in the MS4 Permit:

- Legal authority and regulatory mechanism to prohibit illicit discharges and enforce this prohibition
- Storm system mapping
- Inventory and ranking of outfalls
- Dry weather outfall screening
- Catchment investigations
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training.

The IDDE investigation procedure framework is shown in Figure 1-1. The required timeline for implementing the IDDE program is shown in Appendix D of the Westover SWMP.



**Figure 1-1. IDDE Investigation Procedure**

## **2. AUTHORITY AND STATEMENT OF IDDE RESPONSIBILITIES**

Section 4 of the Westover SWMP describes the authority given to the Base Civil Engineer (BCE) to make decisions and enforce actions regarding the stormwater management on Westover ARB.

### **2.1 LEGAL AUTHORITY**

The 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 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 AFMAN 32-1067.

### **2.2 STATEMENT OF RESPONSIBILITIES**

The BCE is the lead department responsible for implementing the IDDE program pursuant to the provisions of the AFMAN.

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### 3. STORMWATER SYSTEM MAPPING

The 2016 MS4 Permit requires the storm system map to be updated in two phases as outlined below. Westover ARB is responsible for updating the stormwater system mapping pursuant to the 2016 MS4 Permit. Westover ARB will report on the progress towards completion of the storm system map in each annual report. Updates to the stormwater mapping will be included in Appendix H of the SWMP.

#### 3.1 PHASE I MAPPING

Phase I mapping is described in Section 4.3.3 of the SWMP (BMP 3d) and must be completed by 1 July 2023. Phase I mapping has been completed and is located in Appendix H of the SWMP. This mapping will be included in each annual report and will be updated as new information becomes available. The current phase I mapping includes the following information:

- Outfalls and receiving waters (previously required by the MS4-2003 permit)
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally owned stormwater treatment structures
- Water bodies identified by name and indication of all use impairments as identified on the most recent EPA approved Massachusetts Integrated List of Waters report
- Initial catchment delineations (topographic contours and drainage system information may be used to produce initial catchment delineations)
- Stormwater piping.

#### 3.2 PHASE II MAPPING

Phase II mapping is described in Section 4.3.3 of the SWMP (BMP 3d) and must be completed by 1 July 2031. Phase II mapping must include the following information:

- Outfall spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Pipes
- Manholes
- Catch basins
- Refined catchment delineations. Catchment delineations must be updated to reflect information collected during catchment investigations
- Municipal sanitary sewer system (if available)
- Municipal combined sewer system (if applicable).

#### 3.3 ADDITIONAL RECOMMENDED MAPPING ELEMENTS

Although not a requirement of the 2016 MS4 Permit, Westover ARB will attempt to include the following recommended elements in its storm system mapping when possible:

- Storm sewer material, size (pipe diameter), and age

- Sanitary sewer system material, size (pipe diameter), and age
- Seasonal high water table elevations impacting sanitary alignments
- Topography
- Orthophotography
- Alignments, dates and representation of work completed of past illicit discharge investigations
- Locations of suspected confirmed and corrected illicit discharges with dates and flow estimates.

#### 4. SANITARY SEWER OVERFLOWS

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including SSOs, to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause serious water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

The SSO inventory is located in Appendix G of the SWMP and is described in Section 4.3.3 of the SWMP report. Westover ARB has had zero incidences of sanitary sewer overflow.

Upon detection of an SSO, Westover ARB will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the Westover ARB will provide oral notice to EPA within 24 hours and written notice to EPA and MassDEP within 5 days of becoming aware of the SSO occurrence.

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## 5. ASSESSMENT AND PRIORITY RANKING OF OUTFALLS

The 2016 MS4 Permit requires an assessment and priority ranking of outfalls in terms of their potential to have illicit discharges and SSOs and the related public health significance. The ranking helps determine the priority order for performing IDDE investigations and meeting permit milestones.

### 5.1 OUTFALL CATCHMENT DELINIATIONS

A catchment is the area that drains to an individual outfall or interconnection. The catchments for each of the MS4 outfalls will be delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. As described in Section 3, initial catchment delineations have been completed as part of the Phase I mapping, and refined catchment delineations will be completed as part of the Phase II mapping to reflect information collected during catchment investigations

### 5.2 OUTFALL AND INTERCONNECTION INVENTORY AND RANKING

Westover ARB has completed an outfall and interconnection inventory and priority ranking to assess illicit discharge potential based on existing information. An updated inventory and ranking will be provided in each annual report thereafter. The inventory will be updated annually to include data collected in connection with dry weather screening and other relevant inspections.

The outfall and interconnection inventory will identify each outfall and interconnection discharging from the MS4, record its location and condition, and provide a framework for tracking inspections, screenings and other IDDE program activities.

Outfalls and interconnections will be classified into one of the following categories:

- **Problem Outfalls:** Outfalls/interconnections with known or suspected contributions of illicit discharges based on existing information shall be designated as Problem Outfalls. This shall include any outfalls/interconnections where previous screening indicates likely sewer input. Likely sewer input indicators are any of the following:
  - Olfactory or visual evidence of sewage
  - Ammonia  $\geq 0.5$  milligrams per liter (mg/L), surfactants  $\geq 0.25$  mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
  - Ammonia  $\geq 0.5$  mg/L, surfactants  $\geq 0.25$  mg/L, and detectable levels of chlorine.

Dry weather screening and sampling, as described in Section 6 of this IDDE Plan and Part 2.3.4.7.b of the MS4 Permit, is not required for Problem Outfalls.

- **High Priority Outfalls:** Outfalls/interconnections that have not been classified as Problem Outfalls and that are:

- Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
- Determined by the permittee as high priority based on the characteristics listed below or other available information.
- **Low Priority Outfalls:** Outfalls/interconnections determined by the permittee as low priority based on the characteristics listed below or other available information.
- **Excluded Outfalls:** Outfalls/interconnections with no potential for illicit discharges may be excluded from the IDDE program. This category is limited to roadway drainage in undeveloped areas with no dwellings and no sanitary sewers; drainage for athletic fields, parks or undeveloped green space and associated parking without services; cross-country drainage alignments (that neither cross nor are in proximity to sanitary sewer alignments) through undeveloped land.

Outfalls were ranked into the above categories based on the following characteristics of the catchment areas.

- Olfactory indicators of sewage
- Sampling results indicating presence of sewage
- Discharging to recreational facilities or facilities with impacts to public health
- Discharging to impaired waters.

Additionally, any outfalls discharging to waters that are impaired by bacteria (*E. coli*) had to be classified as high priority or problem outfalls.

The outfall ranking matrix with associated rankings is located in Table 5-1. Initial ranking determined eight outfalls to be high priority.

**Table 5-1 Initial Outfall Rankings**

Outfall ID	Receiving Water	Receiving Water Impairments <sup>c</sup>	Olfactory Indicators of Sewage	Sampling Results Indicators of Sewage <sup>a</sup>	Discharges to Recreational Facilities or Facilities with Impacts to Public Health <sup>b</sup>	Discharging to Impaired Waters	Score	Priority Ranking
Information Score & Scoring Criteria			Yes = 3 No = 0	Yes = 3 Sampling Not Yet Performed = 1 No = 0	Yes = 3 No = 0	Yes = 3 No = 0		≥ 10 = Problem 6 – 9 = High Priority ≤ 5 = Low Priority
001	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
002	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
003	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
004	Willamanett Brook (MA34-60) Long Island Sound	E. coli and total nitrogen	0	1	0	3	4	High Priority <sup>c</sup>
006	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
007	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
009	Cooley Brook (MA36-38) Long Island Sound	Total nitrogen	0	1	3	3	7	High Priority
011	Stoney Brook (MA34-19) Long Island Sound	Non-native aquatic plants, E. coli, turbidity, and total nitrogen	0	1	0	3	4	High Priority <sup>c</sup>

Notes:

Revision Date: 3 June 2022

<sup>a</sup> Previous screening results indicate likely sewer input if any of the following are true:

- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine

<sup>b</sup> Outfalls/interconnections that discharge to or in the vicinity of any of the following areas: public beaches, recreational areas, drinking water supplies, or shellfish beds

<sup>c</sup> Outfalls discharging to waters impaired by bacteria (E. coli) must be classified as Problem or High-Priority (2016 Final Permit Appendix H Part III.2.ii).

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## **6. DRY WEATHER OUTFALL SCREENING AND SAMPLING**

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and Excluded Outfalls) to be inspected for the presence of dry weather flow. Westover ARB is responsible for conducting dry weather outfall screening, starting with High Priority outfalls, followed by Low Priority outfalls, based on the initial priority rankings described in the Section 5. The first dry weather screening and sampling must be conducted by 1 July 2024, and follow-up screening must occur every 5 years.

### **6.1 WEATHER CONDITIONS**

Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, program staff will use precipitation data from Springfield/Chicopee (KCEF) weather station. If Springfield/Chicopee (KCEF) weather station is not available or not reporting current weather data, then Fairview (KMACHICO30) weather station will be used as a back-up.

### **6.2 DRY WEATHER SCREENING/SAMPLING PROCEDURE**

#### **6.2.1 General Procedure**

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on initial outfall inventory and priority ranking
2. Acquire the necessary staff, mapping, and field equipment (Table 6-1 provides a list of potential field equipment)
3. Conduct the outfall inspection during dry weather:
  - a. Mark and photograph the outfall
  - b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device)
  - c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper or sanitary products). Also observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If flow is observed, sample and test the flow following the procedures described in the following sections.

5. If no flow is observed, but evidence of illicit flow exists (illicit discharges are often intermittent or transitory), revisit the outfall during dry weather within 1 week of the initial observation, if practicable, to perform a second dry weather screening and sample any observed flow. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.
6. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
7. Include all screening data in the annual report.

## 6.2.2 Field Equipment

Table 6-1 lists field equipment commonly used for dry weather outfall screening and sampling.

**Table 6-1. Field Equipment – Dry Weather Outfall Screening and Sampling**

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field sheets	Field sheets for both dry weather inspection and dry weather sampling should be available with extras
Chain-of-Custody forms	To ensure proper handling of all samples
Pens/pencils/permanent markers	For proper labeling
Nitrile gloves	To protect the sampler as well as the sample from contamination
Flashlight/headlamp with batteries	For looking in outfalls or manholes, helpful in early mornings as well
Cooler with ice	For transporting samples to the laboratory
Digital camera	For documenting field conditions at time of inspection
PPE	Reflective vest, safety glasses and boots at a minimum
GPS receiver	For taking spatial location data
Water quality sonde	If needed, for sampling conductivity, temperature, pH
Water quality meter	Handheld meter, if available, for testing for various water quality parameters such as ammonia, surfactants and chlorine
Test kits	Have extra kits on hand to sample more outfalls than are anticipated to be screened in a single day
Label tape	For labeling sample containers
Sample containers	Make sure all sample containers are clean Keep extra sample containers on hand at all times Make sure there are proper sample containers for what is being sampled for (i.e., bacteria requires sterile containers)
Pry bar or pick	For opening catch basins and manholes, when necessary
Sandbags	For damming low flows in order to take samples
Small mallet or hammer	Helping to free stuck manhole and catch basin covers
Utility knife	Multiple uses
Measuring tape	Measuring distances and depth of flow
Safety cones	Safety
Hand sanitizer	Disinfectant/decontaminant
Zip ties/duct tape	For making field repairs
Rubber boots/waders	For accessing shallow streams/areas
Sampling pole/dipper/sampling cage	For accessing hard to reach outfalls and manholes

Notes:

PPE = Personal protective equipment

### 6.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample will be collected and analyzed for the required permit parameters listed in Table 6-2. The general procedure for collection of outfall samples is as follows:

1. Fill out all sample information on sample bottles and field sheets
2. Put on protective gloves (nitrile/latex/other) before sampling
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling)
5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (Table 6-2)
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern
7. Fill out chain-of-custody form for laboratory samples
8. Deliver samples to laboratory
9. Dispose of used test strips and test kit ampules properly
10. Decontaminate all testing personnel and equipment.

In the event that an outfall is submerged, either partially or completely, or inaccessible, field staff will proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. Field staff will continue to the next upstream structure until there is no longer an influence from the receiving water on the visual inspection or sampling.

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. Table 6-2 lists various field test kits and field instruments that can be used for outfall sampling associated with the 2016 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern.

**Table 6-2. Sampling Parameters and Analysis Methods**

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	NA
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Indicator Bacteria: <i>E. coli</i> (freshwater) or <i>Enterococcus</i> (saline water)	EPA-certified laboratory procedure (40 CFR § 136)	NA
Pollutants of Concern <sup>1</sup>	EPA-certified laboratory procedure (40 CFR § 136)	NA

## Notes:

<sup>1</sup> Where the discharge is directly into a water quality limited water or a water subject to an approved TMDL, the sample must be analyzed for the pollutant(s) of concern identified as the cause of the water quality impairment.

CFR = Code of Federal Regulations

NA = Not applicable

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136. Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. Table 6-3 lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

**Table 6-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives**

Analyte or Parameter	Analytical Method	Detection Limit	Maximum Hold Time	Preservative
Ammonia	EPA: 350.2, SM: 4500-NH3C	0.05 mg/L	28 days	Cool $\leq 6^{\circ}\text{C}$ , H <sub>2</sub> SO <sub>4</sub> to pH < 2, No preservative required if analyzed immediately
Surfactants	SM: 5540-C	0.01 mg/L	48 hours	Cool $\leq 6^{\circ}\text{C}$
Chlorine	SM: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None required
Temperature	SM: 2550B	NA	Immediate	None required
Specific Conductance	EPA: 120.1, SM: 2510B	0.2 $\mu\text{s/cm}$	28 days	Cool $\leq 6^{\circ}\text{C}$
Salinity	SM: 2520		28 days	Cool $\leq 6^{\circ}\text{C}$
Indicator Bacteria: <i>E. coli</i> <i>Enterococcus</i>	<i>E. coli</i> EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert <sup>®</sup> , Colilert-18 <sup>®</sup>  <i>Enterococcus</i> EPA: 1600 SM: 9230 C Other: Enterolert <sup>®</sup>	<i>E. coli</i> EPA: 1 cfu/100mL SM: 2 MPN/100mL Other: 1 MPN/100mL  <i>Enterococcus</i> EPA: 1 cfu/100mL SM: 1 MPN/100mL Other: 1 MPN/100mL	8 hours	Cool $\leq 10^{\circ}\text{C}$ , 0.0008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>
Total Phosphorus	EPA: Manual-365.3, Automated Ascorbic acid digestion-365.1 Revision 2, ICP/AES4-200.7 Revision 4.4  SM: 4500-P E-F	EPA: 0.01 mg/L SM : 0.01 mg/L	28 days	Cool $\leq 6^{\circ}\text{C}$ , H <sub>2</sub> SO <sub>4</sub> to pH < 2
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	EPA: Cadmium reduction (automated)-353.2 Revision 2.0, SM: 4500-NO <sub>3</sub> E-F	EPA: 0.05 mg/L SM : 0.05 mg/L	28 days	Cool $\leq 6^{\circ}\text{C}$ , H <sub>2</sub> SO <sub>4</sub> to pH < 2

## Notes:

% = Percent

 $^{\circ}\text{C}$  = Degrees Celsius

cfu = Colony forming unit(s)

H<sub>2</sub>SO<sub>4</sub> = Sulfuric acid

ICP = Inductively coupled plasma

mL = Milliliter(s)

MPN = Most probable number

Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> = Sodium thiosulfateNO<sub>3</sub> = Nitrate

SM = Standard Method

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### 6.3 INTERPRETING OUTFALL SAMPLING RESULTS

Outfall analytical data from dry weather sampling can be used to help identify the major type or source of discharge. Table 6-4 shows values identified by the EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

**Table 6-4. Benchmark Field Measurements of Select Parameters**

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 $\mu$ S/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria: <i>E. coli</i> <i>Enterococcus</i>	<i>E. coli</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 mL and no single sample taken during the bathing season shall exceed 235 colonies per 100 mL  <i>Enterococcus</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 mL and no single sample taken during the bathing season shall exceed 61 colonies per 100 mL

Notes:

$\mu$ S/cm = MicroSiemens per centimeter

### 6.4 FOLLOW-UP RANKING OF OUTFALLS AND INTERCONNECTIONS

Westover ARB will update and re-prioritize the initial outfall and interconnection rankings based on information gathered during dry weather screening. The rankings will be updated periodically as dry weather screening information becomes available.

Outfalls/interconnections where relevant information was found indicating sewer input to the MS4 or sampling results indicating sewer input are highly likely to contain illicit discharges from sanitary sources.

Such outfalls/interconnections will be ranked at the top of the High Priority Outfalls category for investigation. Other outfalls and interconnections may be re-ranked based on any new information from the dry weather screening.

## 7. CATCHMENT INVESTIGATIONS

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to trace the source of the potential discharge within the outfall catchment area. Catchment investigation techniques include but are not limited to review of maps, historic plans, and records; manhole observation; dry and wet weather sampling; video inspection; smoke testing; and dye testing. This section outlines a systematic procedure to investigate outfall catchments to trace the source of potential illicit discharges. All data collected as part of the catchment investigations will be recorded and reported in each annual report. Catchment investigation timeline is in Appendix D of the SWMP.

### 7.1 SYSTEM VULNERABILITY FACTORS

For catchment investigations, Westover ARB will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be reviewed:

- Plans related to the construction of the drainage network
- Plans related to the construction of the sewer drainage network
- Prior work on storm drains or sewer lines
- Board of Health or other municipal data on septic systems
- Complaint records related to SSOs
- Septic system breakouts.

Based on the review of this information, the presence of any of the following System Vulnerability Factors (SVFs) will be identified for each catchment:

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
- Common or twin-invert manholes serving storm and sanitary sewer alignments
- Common trench construction serving both storm and sanitary sewer alignments
- Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
- Inadequate sanitary sewer level of service resulting in regular surcharging, back-ups, or frequent complaints
- Areas formerly served by combined sewer systems
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
- Any sanitary sewer and storm drain infrastructure greater than 40 years old

Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)

- History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance).

An SVF inventory will be documented for each catchment in Table 7-1 on the following page, retained as part of this IDDE Plan, and included in the annual report.

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**Table 7-1 System Vulnerability Factor Inventory**  
Last Revision: 13 June 2022

Outfall ID	Receiving Water	1 History of SSOs	2 Common or Twin Invert Manholes	3 Common Trench Construction	4 Storm/Sanitary Crossings (Sanitary Above)	5 Sanitary Lines with Underdrains	6 Inadequate Sanitary Level of Service	7 Areas Formerly Served by Combined Sewers	8 Sanitary Infrastructure Defects	9 SSO Potential In Event of System Failures	10 Sanitary and Storm Drain Infrastructure >40 years Old	11 Septic with Poor Soils or Water Table Separation	12 History of BOH Actions Addressing Septic Failure
		Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

**Presence/Absence Evaluation Criteria:**

1. History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages
2. Common or twin-invert manholes serving storm and sanitary sewer alignments
3. Common trench construction serving both storm and sanitary sewer alignments
4. Crossings of storm and sanitary sewer alignments where the sanitary system is shallower than the storm drain system
5. Sanitary sewer alignments known or suspected to have been constructed with an underdrain system
6. Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints
7. Areas formerly served by combined sewer systems
8. Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations
9. Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs
10. Any sanitary sewer and storm drain infrastructure greater than 40 years old
11. Widespread code-required septic system upgrades required at property transfers (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)
12. History of multiple Board of Health actions addressing widespread septic system failures (indicative of inadequate soils, water table separation, or other physical constraints of the area rather than poor owner maintenance)

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## 7.2 DRY WEATHER MANHOLE INSPECTIONS

Westover ARB will implement a dry weather storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges or SSOs.

Westover ARB will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit as follows:

- Junction Manhole is a manhole or structure with two or more inlets accepting flow from two or more MS4 alignments. Manholes with inlets solely from private storm drains, individual catch basins, or both are not considered junction manholes for these purposes.
- Key Junction Manholes are those junction manholes that can represent one or more junction manholes without compromising adequate implementation of the illicit discharge program. Adequate implementation of the illicit discharge program would not be compromised if the exclusion of a particular junction manhole as a key junction manhole would not affect the permittee's ability to determine the possible presence of an upstream illicit discharge. A permittee may exclude a junction manhole located upstream from another located in the immediate vicinity or that is serving a drainage alignment with no potential for illicit connections.

For all catchments identified for investigation, during dry weather, field crews will systematically inspect key junction manholes for evidence of illicit discharges. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.

The manhole inspection methodology will be conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall.

For most catchments, manhole inspections will proceed from the outfall moving up into the system.

However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage

system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system requires more advance preparation and reliable drainage system information on the upstream segments of the storm drain system but may be more efficient if the sources of illicit discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of Key Junction Manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections.
2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in Section 6. Additional indicator sampling may assist in determining potential sources (e.g., bacteria for sanitary flows, conductivity to detect tidal backwater, etc.).
3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges or SSOs, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
4. Subsequent Key Junction Manhole inspections will proceed until the location of suspected illicit discharges or SSOs can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

### **7.3 WET WEATHER OUTFALL SAMPLING**

Where a minimum of one SVF is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. Westover ARB will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening.
2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall

amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in Section 7.5.
4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

#### **7.4 SOURCE ISOLATION AND CONFIRMATION**

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques will be used to isolate and confirm the source of the illicit discharge.

The following methods may be used in isolating and confirming the source of illicit discharges:

- Sandbagging
- Smoke testing
- Dye testing
- Closed circuit television/video inspections
- Optical brightener monitoring
- IDDE canines.

These methods are described in the sections below.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or television inspections, the Westover ARB will notify property owners in areas with potential to be affected.

#### **7.4.1 Sandbagging**

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours and should only be installed when dry weather is forecast. If flow has collected behind the sandbags/barriers after 48 hours, it can be assessed using visual observations or by sampling. If no flow collects behind the sandbag, the upstream pipe network can be ruled out as a source of the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

#### **7.4.2 Smoke Testing**

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically, a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful then a more thorough smoke-test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

### **7.4.3 Dye Testing**

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

### **7.4.4 Closed Circuit Television/Video Inspection**

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time consuming when compared to other source isolation techniques.

### **7.4.5 Optical Brightener Monitoring**

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under ultraviolet light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorimeters to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorimeter, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

## **7.5 ILLICIT DISCHARGE REMOVAL**

When the specific source of an illicit discharge is identified, Westover ARB will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

- Location of the discharge and its source(s)
- Description of the discharge
- Method of discovery
- Date of discovery
- Date of elimination, mitigation or enforcement action OR planned corrective measures and a schedule for completing the illicit discharge removal
- Estimate of the volume of flow removed.

### **7.5.1 Confirmatory Outfall Screening**

Within 1 year of removal of all identified illicit discharges within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless SVFs have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation.

## **7.6 ONGOING SCREENING**

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be re-prioritized for screening and scheduled for ongoing screening once every 5 years. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in Section 6. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to SVFs and will be conducted in accordance with the procedures described in Section 7.3. All sampling results will be reported in the annual report.

## 8. TRAINING

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will at a minimum include information on how to identify illicit discharges and SSOs and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained in Appendix J of the SWMP. The frequency and type of training will be included in the annual report. IDDE training to responsible employees must occur before 1 July 2023 (BMP 3e, SWMP Section 4.3).

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## 9. PROGRESS REPORTING

The progress and success of the IDDE program will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include the following indicators of program progress:

- Number of SSOs and illicit discharges identified and removed
- Number and percent of total outfall catchments served by the MS4 evaluated using the catchment investigation procedure
- Number of dry weather outfall inspections/screenings
- Number of wet weather outfall inspections/sampling events
- Number of enforcement notices issued
- All dry weather and wet weather screening and sampling results
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually.

The success of the IDDE program will be measured by the IDDE activities completed within the required permit timelines.

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## 10. REFERENCES

Air Force Reserve Command. 2016. *Integrated Natural Resources Plan, Westover Air Reserve Base, Massachusetts*. 15 August.

Central Massachusetts Regional Stormwater Coalition. 2016. *Illicit Discharge Detection and Elimination Plan*. 30 June.

Westover Air Reserve Base. 2022. *Stormwater Pollution Prevention Plan*. May 30.

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## **Appendix J**

### **IDDE Program Training**

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This appendix will be populated in accordance with the deadlines identified in the SWMP.

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## **Appendix K**

### **List of Retrofit Opportunities**

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## **Appendix L**

### **Nitrogen Source Identification Report**

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**Westover Air Reserve Base  
MS4 (Municipal Separate Storm Sewer System)  
Nitrogen Source Identification Report**

*for coverage under the*

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

*Prepared for*

Headquarters, Air Force Reserve Command  
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*Prepared by*

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June 2022  
Version: DRAFT  
EA Project No. 62943.12

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**LIST OF ACRONYMS AND ABBREVIATIONS**

AFRC	Air Force Reserve Command
BMP	Best management practice
DCIA	Directly connected impervious area
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
GIS	Geographic information system
HQ	Headquarters
HSG	Hydrologic soil group
IA	Impervious area
lb/acre/yr	Pound(s) per acre per year
lb/yr	Pound(s) per year
MS4	Municipal Separate Stormwater System
N	Nitrogen
NRCS	Natural Resource Conservation Service
PA	Pervious area
SWMP	Stormwater Management Program
TMDL	Total maximum daily load
Westover ARB	Westover Air Reserve Base

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## 1. INTRODUCTION

### 1.1 REGULATORY QUALIFICATION

The Municipal Separate Stormwater System (MS4) permit has requirements for municipalities that discharge stormwater to water bodies with a total maximum daily load (TMDL), which Westover Air Reserve Base (Westover ARB) qualifies for as an out-of-state contributor. Long Island Sound has a TMDL for nitrogen, and since Westover ARB discharges into tributaries that ultimately lead to Long Island Sound, the Westover ARB Stormwater Management Program (SWMP) must address concerns of nitrogen loading into stormwater systems. This report is an appendix to the facility Stormwater Management Program (SWMP) that addresses the nitrogen source identification requirements.

### 1.2 IDENTIFICATION REPORT REQUIREMENTS

Appendix F of the MS4 permit describes the requirements of MS4 permit holders to address TMDL requirements and nutrient loading. Requirements of the Nitrogen Source Identification Report from Section B.I.1.b of MS4 Appendix F are listed below:

- Calculation of total urbanized area within the permittee's jurisdiction that is within the Connecticut River Watershed, the Housatonic River Watershed, or the Thames River Watershed, incorporating updated mapping of the MS4 and catchment delineations produced pursuant to Part 2.3.4.6
- All screening and monitoring results pursuant to Part 2.3.4.7.d., targeting the receiving water segment(s)
- Impervious area (IA) and directly connected impervious area (DCIA) for the target catchment
- Identification, delineation, and prioritization of potential catchments with high nitrogen loading
- Identification of potential retrofit opportunities or opportunities for the installation of structural best management practices (BMPs) during re-development.

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## 2. CALCULATION OF URBANIZED AND IMPERVIOUS AREA

This section includes methods and calculations of total urbanized area, IA, and DCIA. Urbanized area includes all areas that have been altered from their natural state and developed for use. IA includes all areas that prevent infiltration of stormwater, such as parking lots, roads, and buildings. DCIA is considered to be the portion of IA that has a direct connection to the stormwater system or water bodies via continuous contact with impervious surfaces including gutters, drains, pipes, or other conveyance structures (U.S. Environmental Protection Agency [EPA] 2014). A map of Westover ARB showing catchments and impervious area is in Appendix H of the SWMP.

### 2.1 URBANIZED AREA

For the context of the MS4 permit, urbanized area is the census designated areas of higher density settlement and their surrounding areas. Westover ARB is primarily located in the Springfield urban area (urban area 83926) as defined by the 2010 United States census. Westover ARB has an area of 2,242 acres, all of which is within the Connecticut River Watershed. The majority of the Westover ARB, 2,103 acres, is in the Springfield urban area while 139 acres is not contained within an urban area (U.S. Department of Commerce, 2010). Therefore, 93.8 percent of the base is urbanized.

### 2.2 IMPERVIOUS AREA

Massachusetts provides geographic information system (GIS) data on impervious area within the state, which was used to estimate the total impervious area within Westover ARB. This is an EPA-approved source for impervious area data. Westover ARB has an estimated 556.4 acres of IA in their 2,511 acres of total land area, making it 22.2 percent IA.

### 2.3 DIRECTLY CONNECTED IMPERVIOUS AREA

For the purposes of the MS4 permit, DCIA is considered the portion of IA with a direct hydraulic connection to the MS4 or a waterbody via continuous paved or impervious surfaces. This area does not include drainage to stormwater BMPs designed to meet volume reduction and groundwater recharge goals. DCIA is calculated using empirical equations for various watershed types. For Westover ARB, the “average” watershed selection criteria was used, described as “mostly storm sewered with curb and gutter, no dry wells or infiltration, residential rooftops are not directly connected.” The assumed land uses for these criteria are commercial, industrial, institutional, open land, and medium density residential. The following equation was used (EPA 2014), where DCIA and IA are measured as percentages of total land area:

$$DCIA = 0.1(IA)^{1.5}$$

Westover ARB is 30.8 percent IA; therefore, the DCIA is 17.1 percent of land cover, or 308.6 acres.

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### 3. SCREENING AND MONITORING RESULTS

No screening or monitoring has been required to meet MS4 requirements at the time this report was written; therefore, no screening has yet been performed. Dry weather screening and sampling is required to be completed by Year 6 of the MS4 program. Once screening data becomes available, it will be added to this report.

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## 4. IDENTIFICATION OF POTENTIAL HIGH NUTRIENT LOADING AREAS

Westover ARB has no evidence of common sources of nitrogen present at the site. A catchment assessment was still performed for determining potentially high nitrogen loading areas as is required by the MS4 permit. This assessment followed methods described in Appendix F of the MS4 report for estimating loading rates based on cover type and soil type. Two catchments, for Outfalls 1 and 3, were identified as having a higher nitrogen loading potential due to the larger area of impervious cover within both catchments.

### 4.1 POTENTIAL NITROGEN SOURCES

As part of the Phase I mapping in accordance with the MS4 permit, catchments for each outfall were defined and are depicted in Appendix H of the SWMP. Potential sources of nitrogen loading and applicability at Westover ARB are described in Section 5.1 of the SWMP (BMP 7a). Major potential sources of nitrogen include:

- Atmospheric precipitation
- Geological sources
- Fertilizer application
- Agricultural land use
- Poultry, livestock, and urban waste.

Westover ARB has no evidence of nitrogen input from geological sources being a significant contribution to total nitrogen. In addition, this would be an input that are out of the direct control of Westover ARB. Likewise, there is no agricultural, livestock, or poultry land use at Westover ARB; therefore, these are not potential nitrogen sources. As described in Section 4.1.1 of the SWMP, pets are not permitted on Westover ARB, therefore pet waste is not a source of nitrogen at Westover. The most likely contributors of nitrogen at Westover ARB are atmospheric deposition and fertilizer application; however, as described in Section 5.1 of the SWMP, fertilizer use is discouraged by the Integrated Natural Resources Management Plan (Air Force Reserve Command, 2015); and therefore, is not a major source at Westover ARB. The Integrated Natural Resources Management Plan is the guiding document for land use management at Westover ARB and dictates procedures for regular maintenance and upkeep of the facility.

While there are no sources of high potential nitrogen loading at Westover ARB, an assessment of potential catchments with high nitrogen loading was still performed as required by the MS4.

### 4.2 CATCHMETN ASSESSMENT

Each outfall on site was assessed to determine the potential for nitrogen loading to downstream waters. Outfall catchments had previously been delineated and identified and are shown in Appendix H of the SWMP. The methods described in Appendix F, Attachment 2 of the MS4 permit were used to estimate nitrogen loading based on the impervious area and the soil type for each catchment. Loading rates for various land cover types and hydrologic soil groups (HSGs) were provided in the MS4 permit for use in calculating nitrogen load reduction credits. This report does not estimate nitrogen reduction credits for BMPs; however, the first step of that calculation

involves estimating a baseline nitrogen load on the catchment. That initial loading calculation is used here to assess, which catchments have higher potential nitrogen loads.

The guidelines in the MS4 calculations direct that government properties should be included in the category “Commercial and Industrial” for land use type. All catchments used the given values for this category in calculations for nitrogen loading potential. HSG for each catchment was determined using the Natural Resource Conservation Service (NRCS) web soil survey (USDA NRCS 2022). Much of the site is classified as “Urban Land” without a HSG designation. The nitrogen loading rates table in Appendix F of the MS4 directs that when the HSG is not known, to assume HSG C when estimating nitrogen loading rates. HSG C loading rates were used in catchments where the HSG is not known. The given estimated nitrogen loading rate for commercial or industrial DCIA is 15.0 pounds per acre per year (lb/acre/yr), for pervious HSG A is 0.3 lb/acre/yr, and for pervious HSG C is 2.4 lb/acre/yr.

To determine loading rates for impervious area, the MS4 methods use DCIA for loading rates. The methods described in Section 2.2 of this report were used for each catchment to estimate DCIA. Results with DCIA and estimated loading rates are displayed in Table 1.

**Table 1. Catchment Nitrogen Loading**

Catchment	Total Area (acre)	IA (acre)	PA (acre)	%IA	%DCIA	DCIA (acre)	HSG	DCIA N load (lb/yr)	Pervious N Load (lb/yr)	Total N Load (lb/yr)
1	171.6	106.4	65.2	62.0	48.8	83.8	C	1257	156	<b>1413</b>
2	131.7	72.5	59.2	55.0	40.8	53.8	C	807	142	<b>949</b>
3	177.2	108.1	69.1	61.0	47.6	84.4	C	1266	166	<b>1432</b>
4	353.2	70.8	282.4	20.0	9.0	31.7	C	475	678	<b>1153</b>
6	170.3	94.2	76.1	55.3	41.1	70.1	C	1051	183	<b>1234</b>
7	163	36.7	126.3	22.5	10.7	17.4	C	261	303	<b>564</b>
9	142.4	21.2	121.2	14.9	5.7	8.2	A	123	36	<b>159</b>
11	499	46.5	452.5	9.3	2.8	14.2	A	213	136	<b>349</b>

Notes:  
 IA = Impervious area  
 PA = Pervious area  
 DCIA = Directly connected impervious area  
 HSG = Hydrologic soil group  
 N = Nitrogen  
 lb/yr = Pound(s) of nitrogen per year

As shown in Table 1, Outfalls 1 and 3 were those with the highest potential for nitrogen loading. This is primarily due to the higher IA that each of these catchments have, as higher IA results in higher DCIA, which has a significantly higher nitrogen loading rate than other land uses.

These results should not be used as definitive estimates of nitrogen loading, but rather as a method to compare catchments and prioritize their loading potential. The calculation methods described are meant to be used for nitrogen load reduction credits. Additionally, these estimates are likely conservative, and the nitrogen loading is likely lower than the values displayed here. This is primarily due to the lack of traditional sources of nitrogen as described in Section 3.1, as well as

the land cover types used in this model. The calculation methods dictate using commercial or industrial land cover for government facilities; however, Westover ARB has significant areas of forest, wetlands, and grasses that would lead to much lower loading rates if used.

### **4.3 POTENTIAL RETROFIT OPPORTUNITIES**

The MS4 permit requires identification of potential locations for retrofit or new implementation of BMPs to reduce nitrogen impacts based on the locations of high loading potential. The areas with the highest potential for nitrogen loading are the catchments that drain to Outfalls 1 and 3; however, Outfalls 2, 4, and 6 all had higher levels of potential nitrogen loading that could also be addressed. All these areas currently have stormwater management infrastructure in place. Part of Year 5 MS4 requirements include compiling a list of retrofit opportunities and completing a structural BMP evaluation of retrofit opportunities at Westover ARB. The potential to reduce nitrogen loading will be included in this evaluation and help determine where retrofit opportunities would be most beneficial. Retrofit opportunities will be identified by June 2023 in accordance with the permit.

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## 5. REFERENCES

Air Force Reserve Command. 2016. Integrated Natural Resources Plan, Westover Air Reserve Base, Massachusetts. 15 August.

U.S. Department of Agriculture, Natural Resource Conservation Service. 2021. *Custom Soil Resource Report for Hampden County, Massachusetts, Central Part; and Hampshire County, Massachusetts, Central Part, Westover ARB.*

U.S. Department of Commerce. 2010. *Urbanized Area Outline Map (Census 2010) Springfield, MA—CT.*

U.S. Environmental Protection Agency. 2014. *Estimating Change in Impervious Area (IA) and Directly Connected Impervious Area (DCIA) for Massachusetts Small MS4 Permit, Small MS4 Technical Support Document*

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## **Appendix M**

### **Structural BMP Evaluation**

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## **Appendix N**

### **Planned Structural BMPs**

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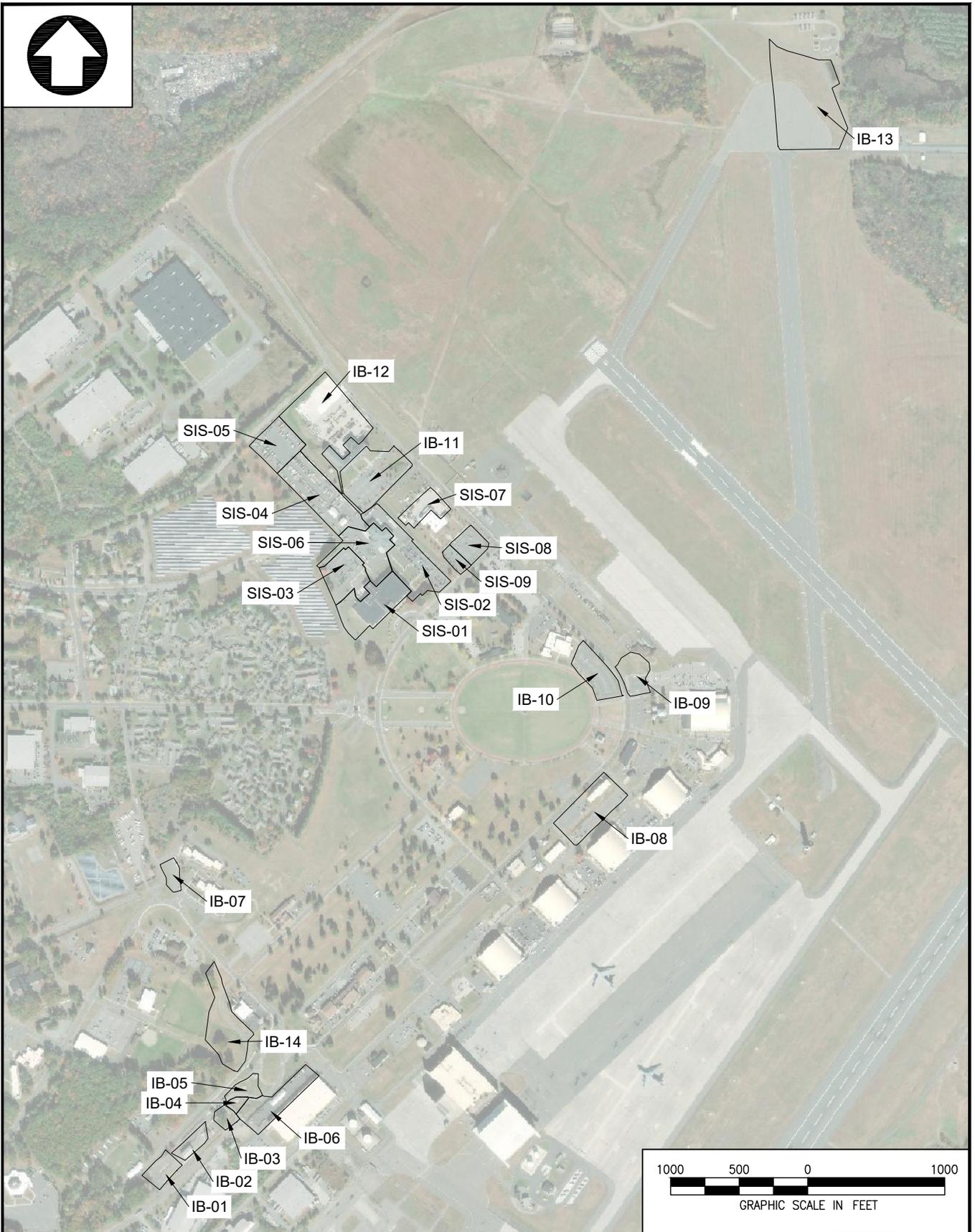
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## **Appendix O**

### **BMP Tracking for Nitrogen Removal**

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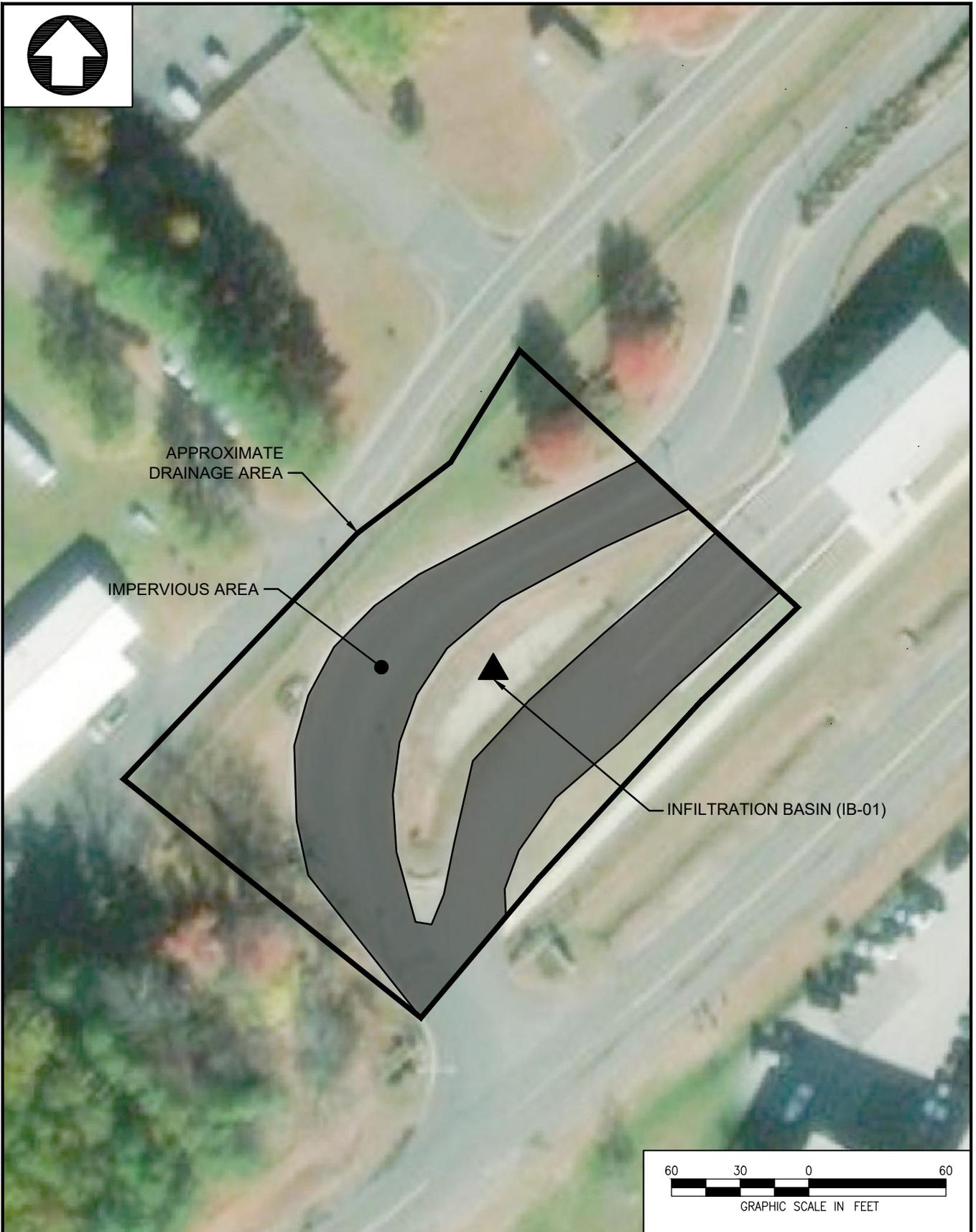


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**WESTOVER AIR RESERVE BASE  
 MS4 STORMWATER  
 MANAGEMENT PROGRAM**  
 Chicopee, Massachusetts

**STRUCTURAL BMP TRACKING  
 BMP LOCATIONS**

DATE: SEPT 2021	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 1
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 Chicopee, Massachusetts

**STRUCTURAL BMP TRACKING  
 IB-01**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 2
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 01**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

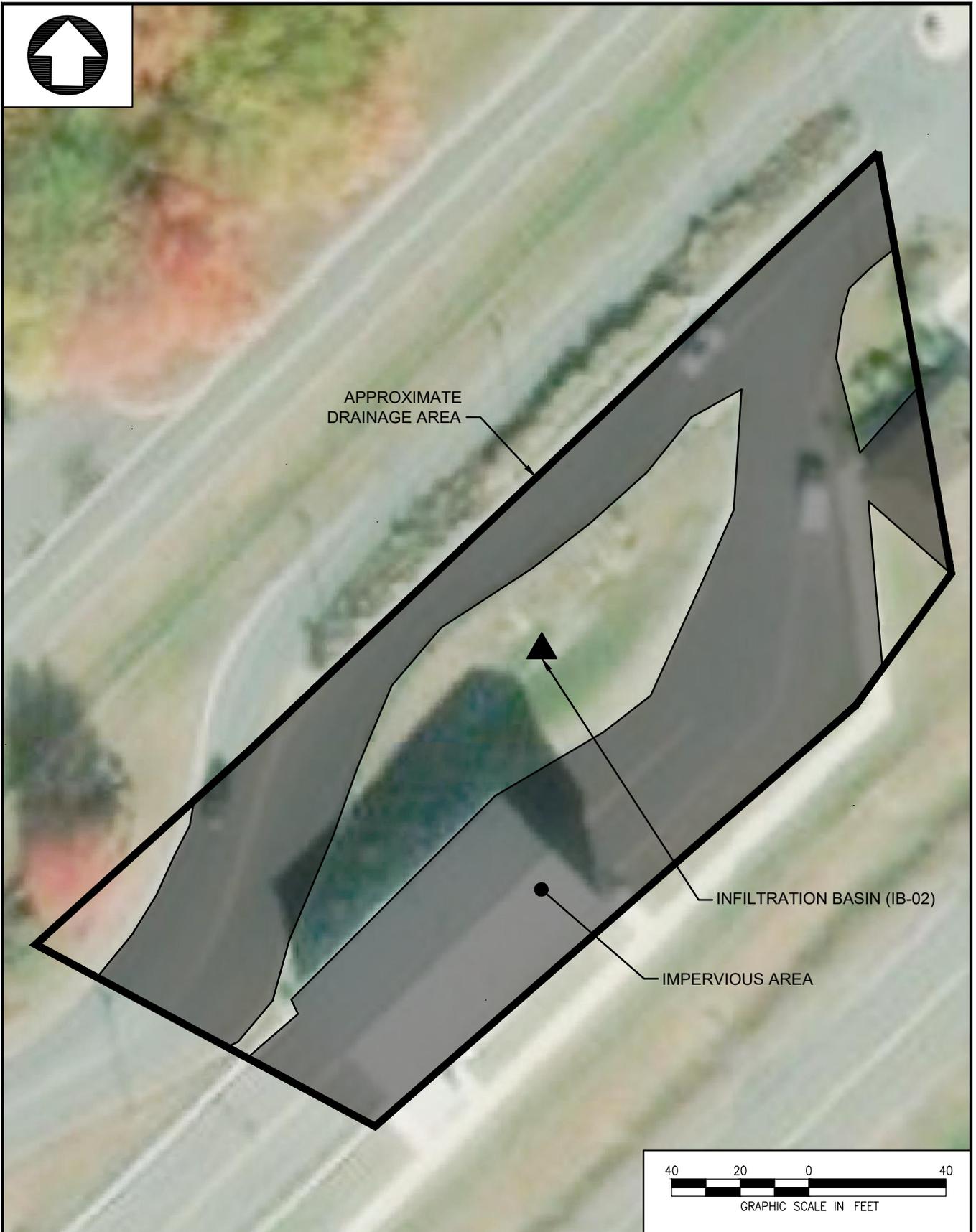
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.42 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.50 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	6.01 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	8539 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	5.37 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	5.77 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.92 ac
Design Storage Volume	8539 ft <sup>3</sup>
Nitrogen removed	5.77 lbs/yr



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**WESTOVER AIR RESERVE BASE  
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**STRUCTURAL BMP TRACKING  
 IB-02**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 3
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 02**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.49 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.22 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	6.92 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	6070.2 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	3.44 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	6.64 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.71 ac
Design Storage Volume	6070.2 ft <sup>3</sup>
Nitrogen removed	6.64 lbs/yr



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**WESTOVER AIR RESERVE BASE  
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**STRUCTURAL BMP TRACKING  
IB-03**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 4
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 03**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.09 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.39 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	1.34 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	414.1 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.22 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	61 %	Percent nitrogen removal efficiency
<i>N</i>	0.82 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.48 ac
Design Storage Volume	414.1 ft <sup>3</sup>
Nitrogen removed	0.82 lbs/yr



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**WESTOVER AIR RESERVE BASE  
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 Chicopee, Massachusetts

**STRUCTURAL BMP TRACKING  
 IB-04**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 5
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

### MS4 SWMP BMP 7e: Structural BMP Tracking

**Basin:** **Infiltration Basin 04**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.10 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.15 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	1.48 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	1553.7 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	3.85 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	1.42 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.25 ac
Design Storage Volume	1553.7 ft <sup>3</sup>
Nitrogen removed	1.42 lbs/yr



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**STRUCTURAL BMP TRACKING  
IB-05**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 6
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 05**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

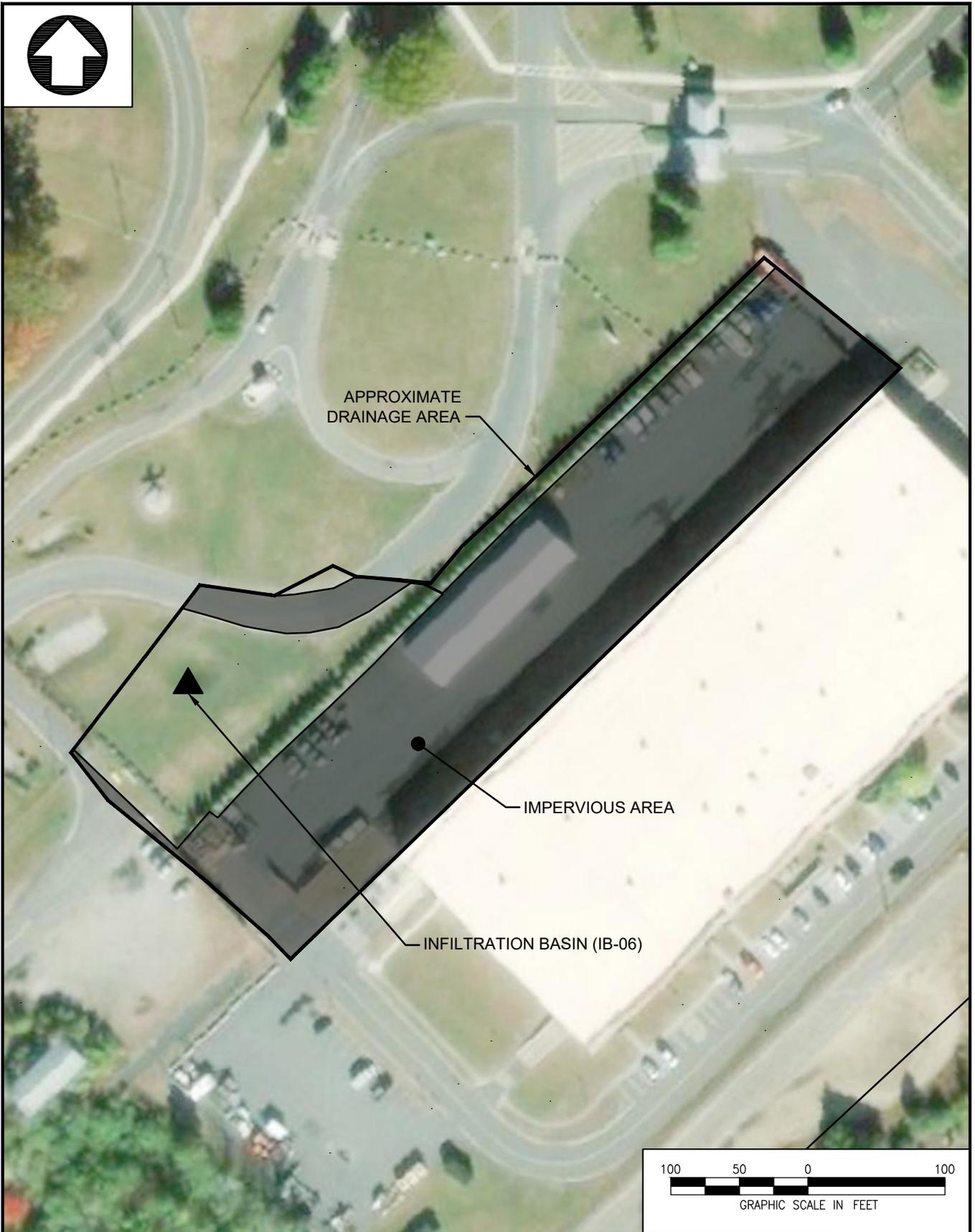
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.14 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.54 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	2.16 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	204 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.40 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	72 %	Percent nitrogen removal efficiency
<i>N</i>	1.55 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.68 ac
Design Storage Volume	204 ft <sup>3</sup>
Nitrogen removed	1.55 lbs/yr



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**STRUCTURAL BMP TRACKING  
IB-06**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 7
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 06**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.72 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.61 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	24.44 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	2110.5 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.34 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	68 %	Percent nitrogen removal efficiency
<i>N</i>	16.62 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	2.33 ac
Design Storage Volume	2110.5 ft <sup>3</sup>
Nitrogen removed	16.62 lbs/yr



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**STRUCTURAL BMP TRACKING  
 IB-07**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 8
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 07**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

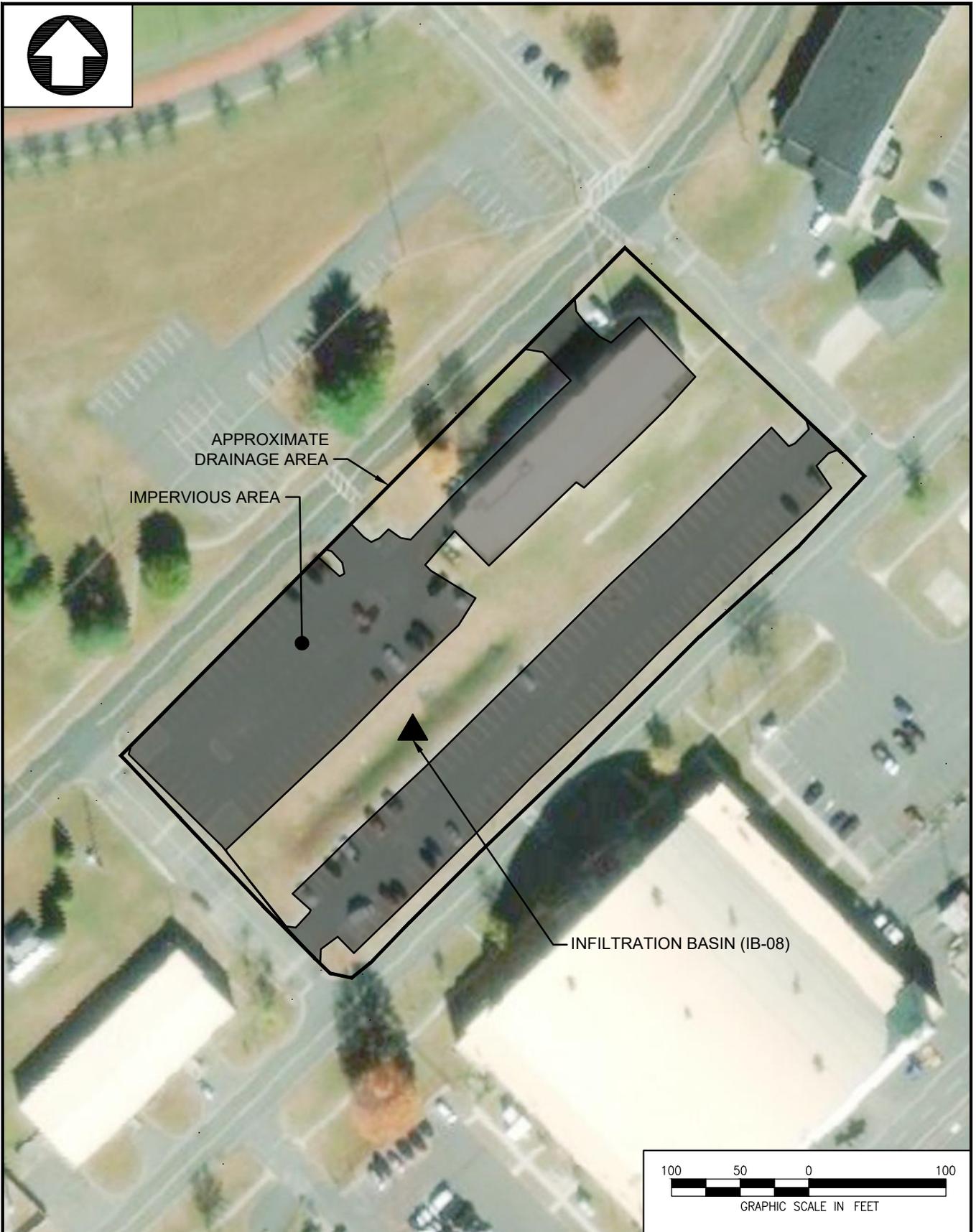
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.37 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.18 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	5.24 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	3813 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	2.86 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	5.03 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.55 ac
Design Storage Volume	3813 ft <sup>3</sup>
Nitrogen removed	5.03 lbs/yr



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**STRUCTURAL BMP TRACKING  
IB-08**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 9
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 08**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

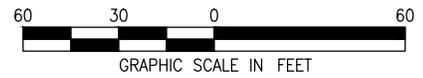
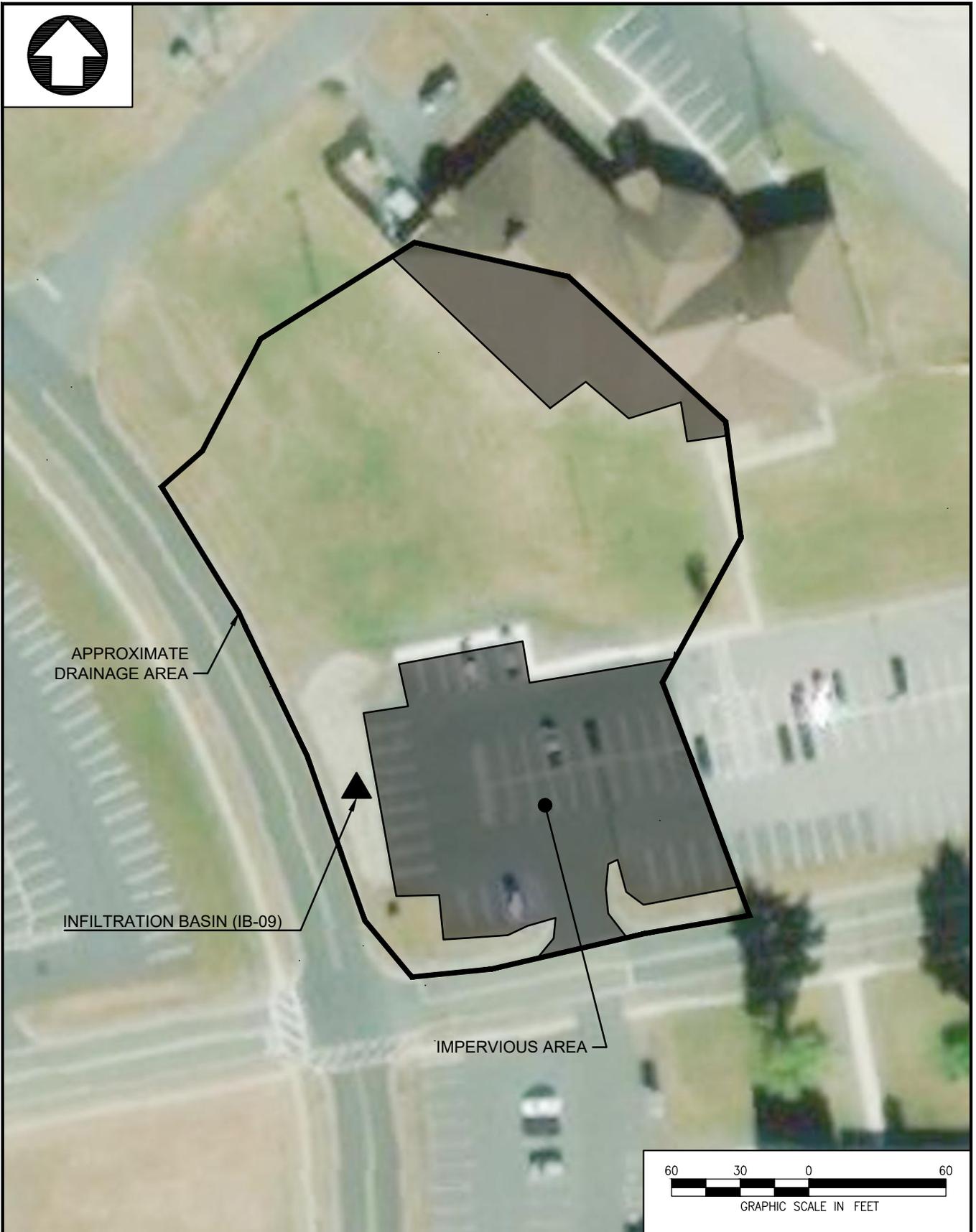
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.64 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	1.25 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	23.46 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	44256.2 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	7.45 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	22.52 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	2.88 ac
Design Storage Volume	44256.2 ft <sup>3</sup>
Nitrogen removed	22.52 lbs/yr



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**STRUCTURAL BMP TRACKING  
IB-09**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 10
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 09**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.46 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.82 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	6.71 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	750 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.45 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	74 %	Percent nitrogen removal efficiency
<i>N</i>	4.97 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	1.28 ac
Design Storage Volume	750 ft <sup>3</sup>
Nitrogen removed	4.97 lbs/yr



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**STRUCTURAL BMP TRACKING  
 IB-10**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 11
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 10**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

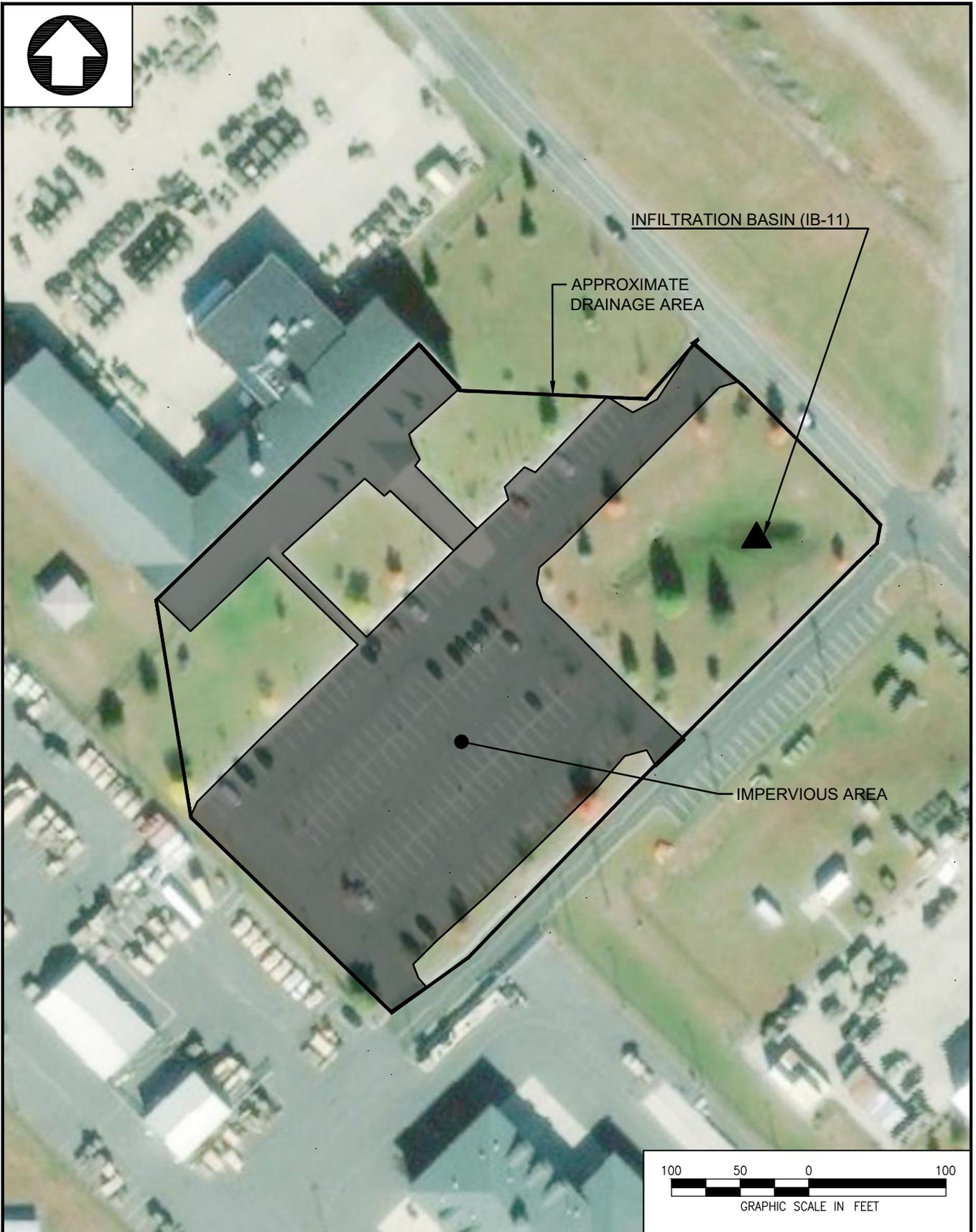
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.31 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.51 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	18.64 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	1306.5 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.27 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	66 %	Percent nitrogen removal efficiency
<i>N</i>	12.30 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	1.82 ac
Design Storage Volume	1306.5 ft <sup>3</sup>
Nitrogen removed	12.30 lbs/yr



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**STRUCTURAL BMP TRACKING  
IB-11**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 12
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 11**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.88 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	1.55 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	26.92 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	9995.7 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	1.27 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	89 %	Percent nitrogen removal efficiency
<i>N</i>	23.96 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	3.43 ac
Design Storage Volume	9995.7 ft <sup>3</sup>
Nitrogen removed	23.96 lbs/yr



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**STRUCTURAL BMP TRACKING  
 IB-12**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 13
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 12**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	3.80 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	2.11 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	54.15 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	47571 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	3.50 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	95 %	Percent nitrogen removal efficiency
<i>N</i>	51.45 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	5.90 ac
Design Storage Volume	47571 ft <sup>3</sup>
Nitrogen removed	51.45 lbs/yr



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**STRUCTURAL BMP TRACKING  
 IB-13**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 14
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 13**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

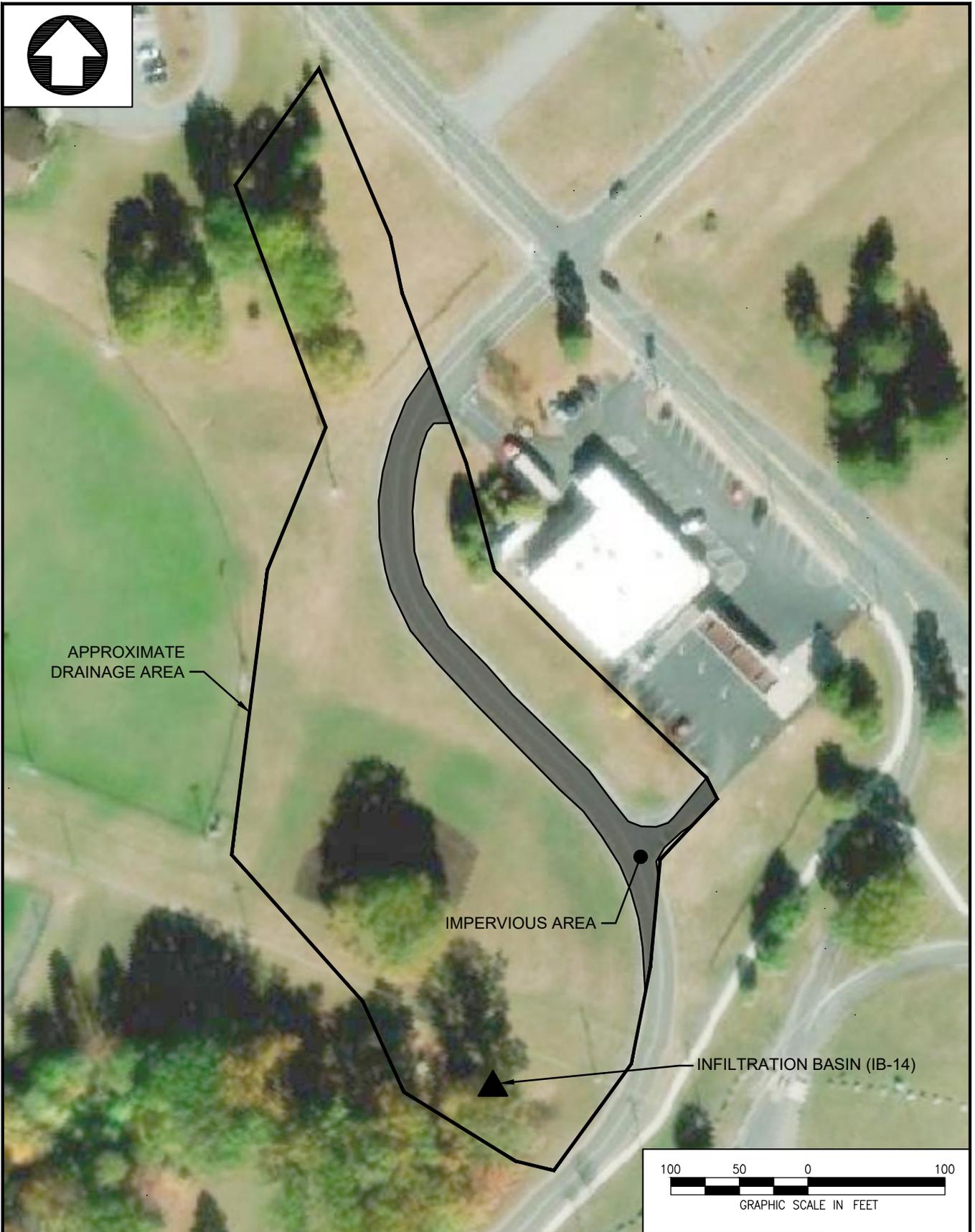
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	3.42 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	4.07 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	49.40 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	14970 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	1.20 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	88 %	Percent nitrogen removal efficiency
<i>N</i>	43.47 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	7.49 ac
Design Storage Volume	14970 ft <sup>3</sup>
Nitrogen removed	43.47 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [IB-14] 12/20/16



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**WESTOVER AIR RESERVE BASE  
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**STRUCTURAL BMP TRACKING  
IB-14**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 15
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Infiltration Basin 14**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Infiltration Basin (IB)

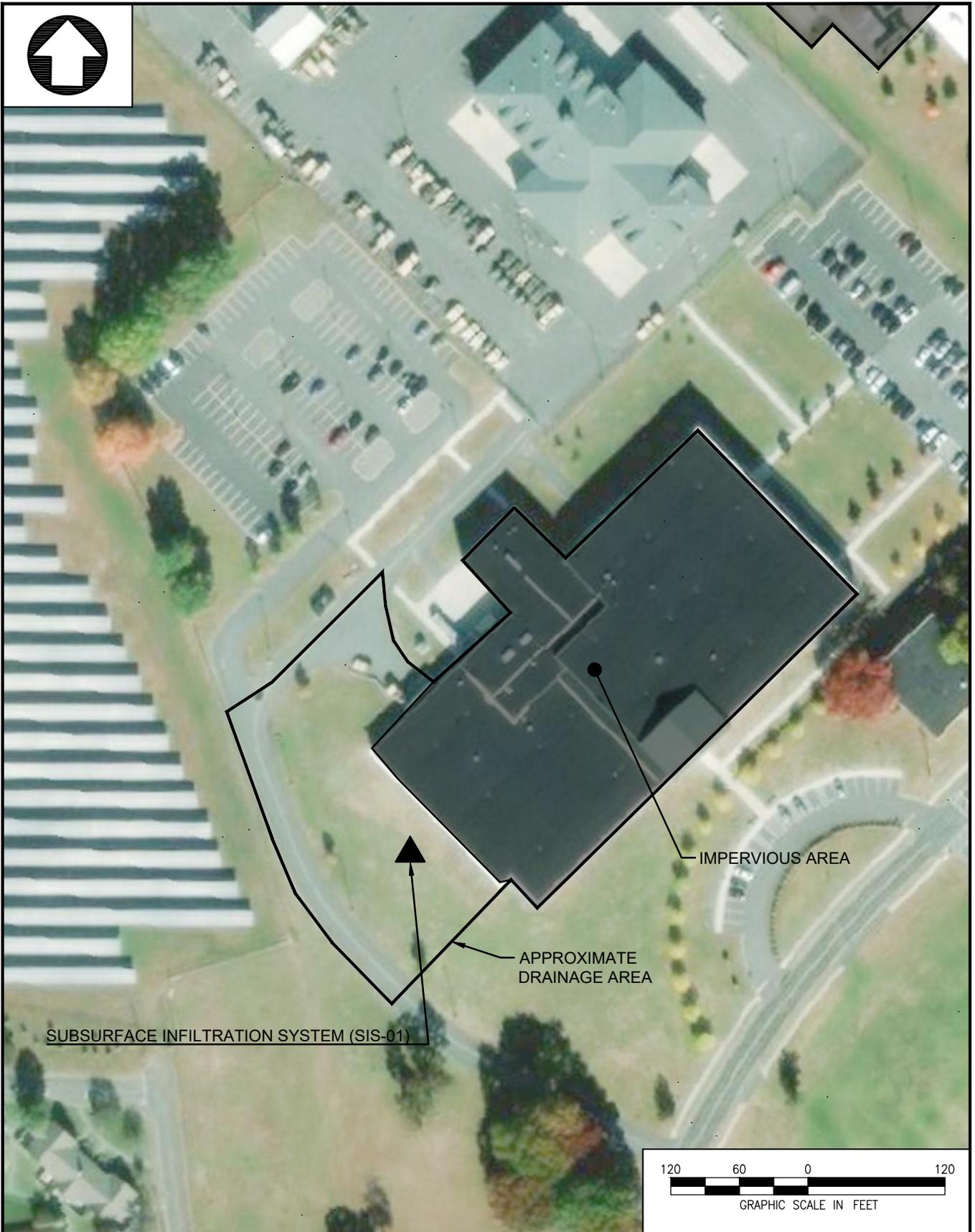
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.28 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	1.84 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	18.64 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	10510 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	1.90 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	95 %	Percent nitrogen removal efficiency
<i>N</i>	17.71 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	3.12 ac
Design Storage Volume	10510 ft <sup>3</sup>
Nitrogen removed	17.71 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-01] 12/20/16



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**STRUCTURAL BMP TRACKING  
 SIS-01**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 16
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 01**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

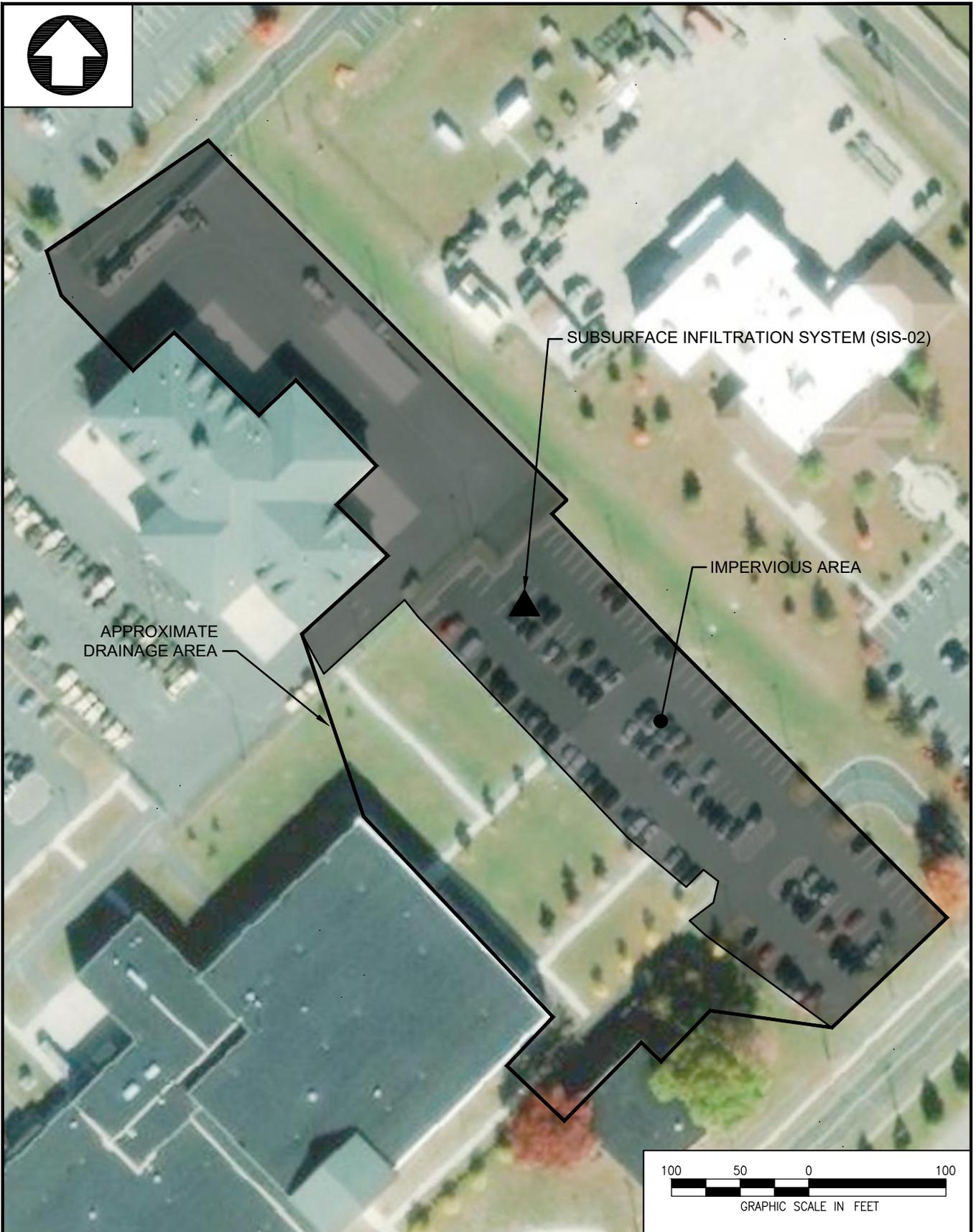
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	2.19 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.66 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	31.01 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	12585 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	1.60 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	91 %	Percent nitrogen removal efficiency
<i>N</i>	28.22 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	2.84 ac
Design Storage Volume	12585 ft <sup>3</sup>
Nitrogen removed	28.22 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-02] 12/20/16



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**STRUCTURAL BMP TRACKING  
 SIS-02**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 17
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 02**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

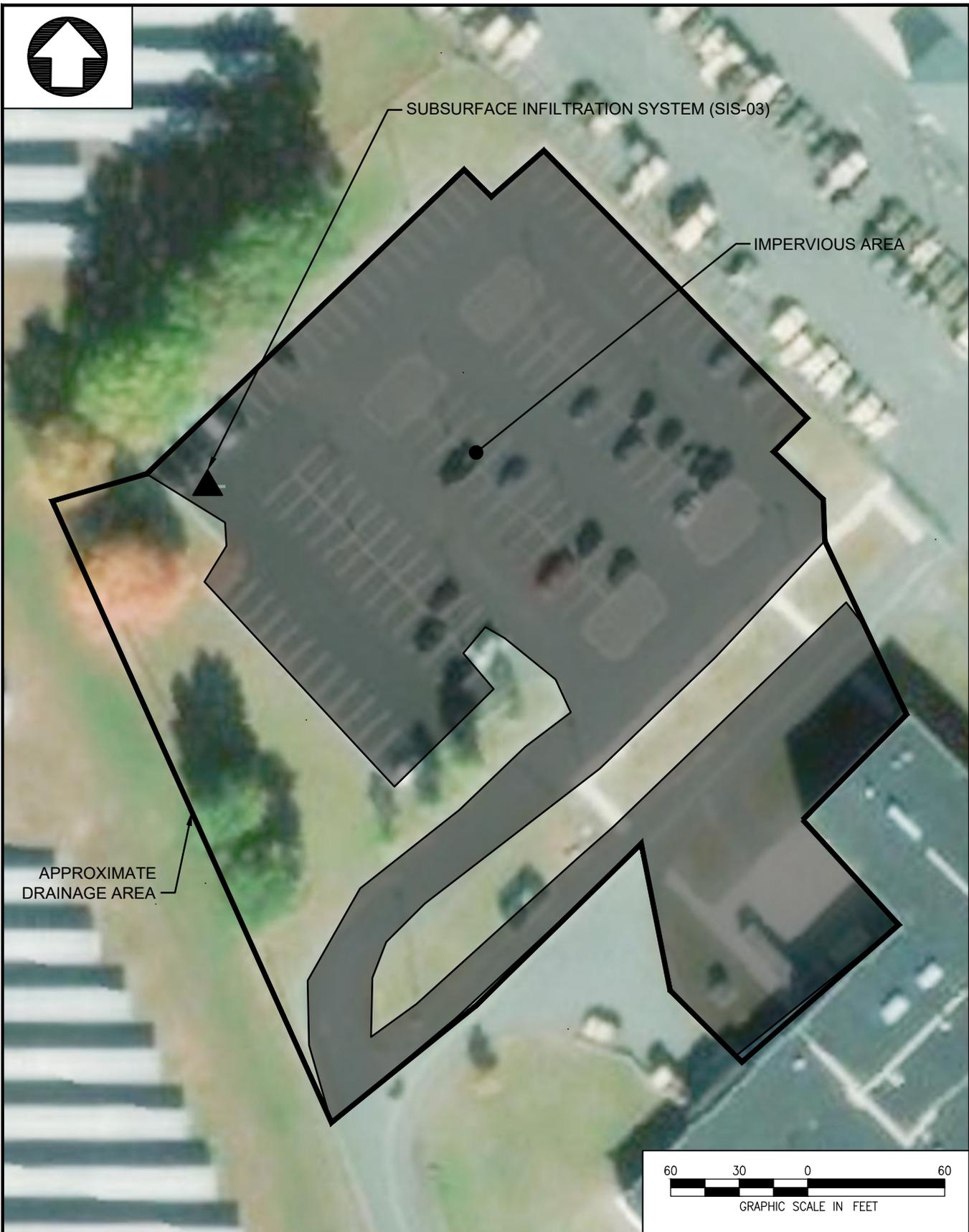
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	2.00 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	1.54 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	28.61 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	16481 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	2.10 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	27.46 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	3.54 ac
Design Storage Volume	16481 ft <sup>3</sup>
Nitrogen removed	27.46 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-03] 12/20/16



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**STRUCTURAL BMP TRACKING  
 SIS-03**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 18
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 03**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

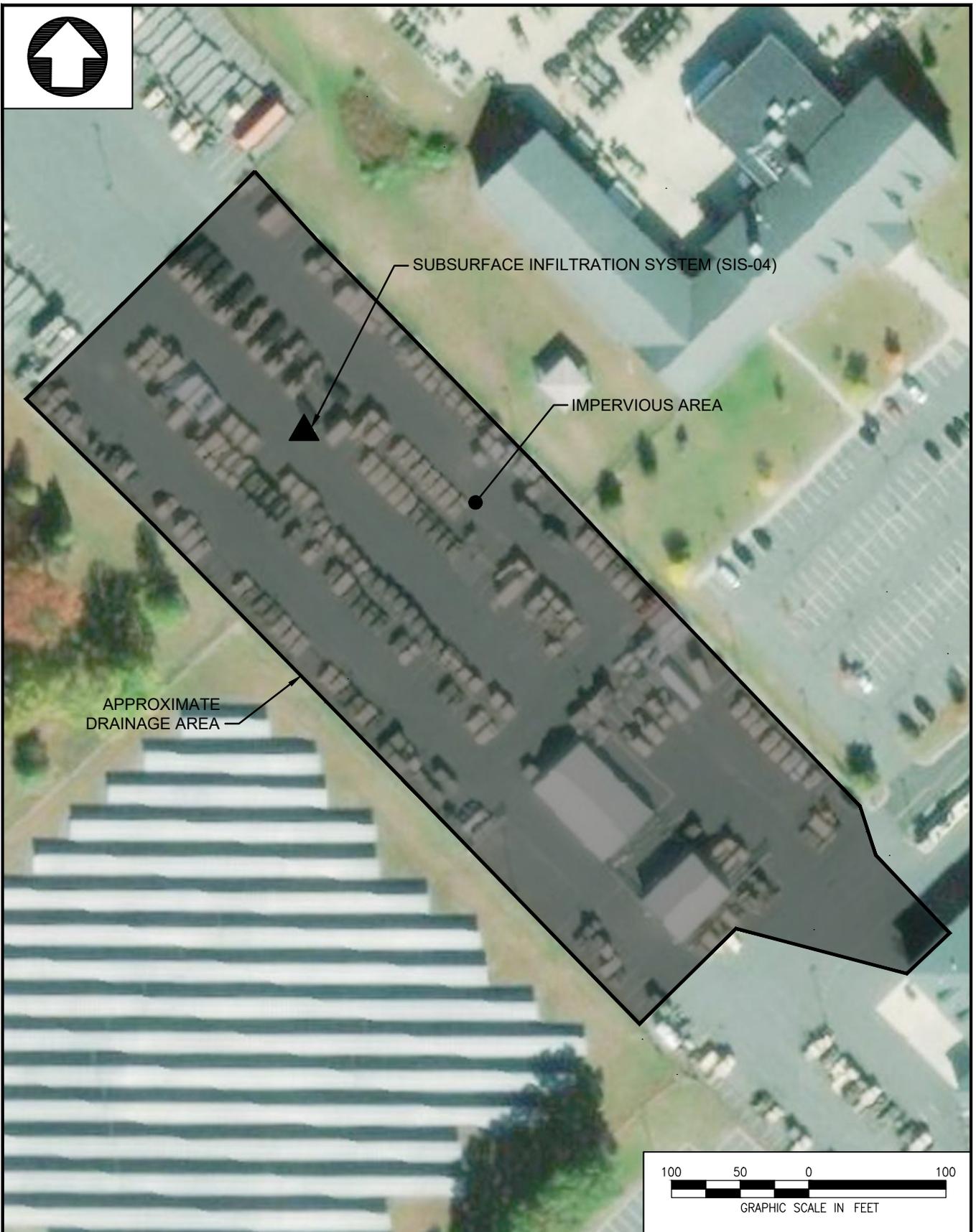
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
	<i>IA</i>	1.28 ac Impervious Area (calculated in AutoCad)
	<i>PA</i>	0.94 ac Pervious Area HSG A (calculated in AutoCad)
	$ER_{IA}$	14.10 lbs/ac/yr Impervious area export rate (constant)
	$ER_{PA}$	0.3 lbs/ac/yr Pervious area export rate for HSG A (constant)
	<i>N Load<sub>total</sub></i>	18.33 lbs/yr Total annual BMP nitrogen load
	$V_{pond}$	9801 ft <sup>3</sup> Storage volume of pond
	$V_{IA-in}$	2.01 in Contributing impervious area (from iterative process in Appendix)
	$N_{removal}$	95 % Percent nitrogen removal efficiency
	<i>N</i>	17.41 lbs/yr Nitrogen removed annually

2. Results

Total Area Treated	2.22 ac
Design Storage Volume	9801 ft <sup>3</sup>
Nitrogen removed	17.41 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-04] 12/20/16



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**STRUCTURAL BMP TRACKING  
 SIS-04**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 19
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 04**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
	<i>IA</i>	3.62 ac Impervious Area (calculated in AutoCad)
	<i>PA</i>	0.10 ac Pervious Area HSG A (calculated in AutoCad)
	$ER_{IA}$	14.10 lbs/ac/yr Impervious area export rate (constant)
	$ER_{PA}$	0.3 lbs/ac/yr Pervious area export rate for HSG A (constant)
	<i>N Load<sub>total</sub></i>	51.02 lbs/yr Total annual BMP nitrogen load
	$V_{pond}$	23278 ft <sup>3</sup> Storage volume of pond
	$V_{IA-in}$	1.77 in Contributing impervious area (from iterative process in Appendix)
	$N_{removal}$	93 % Percent nitrogen removal efficiency
	<i>N</i>	47.44 lbs/yr Nitrogen removed annually

2. Results

Total Area Treated	3.71 ac
Design Storage Volume	23278 ft <sup>3</sup>
Nitrogen removed	47.44 lbs/yr



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**STRUCTURAL BMP TRACKING  
 SIS-05**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 20
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 05**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

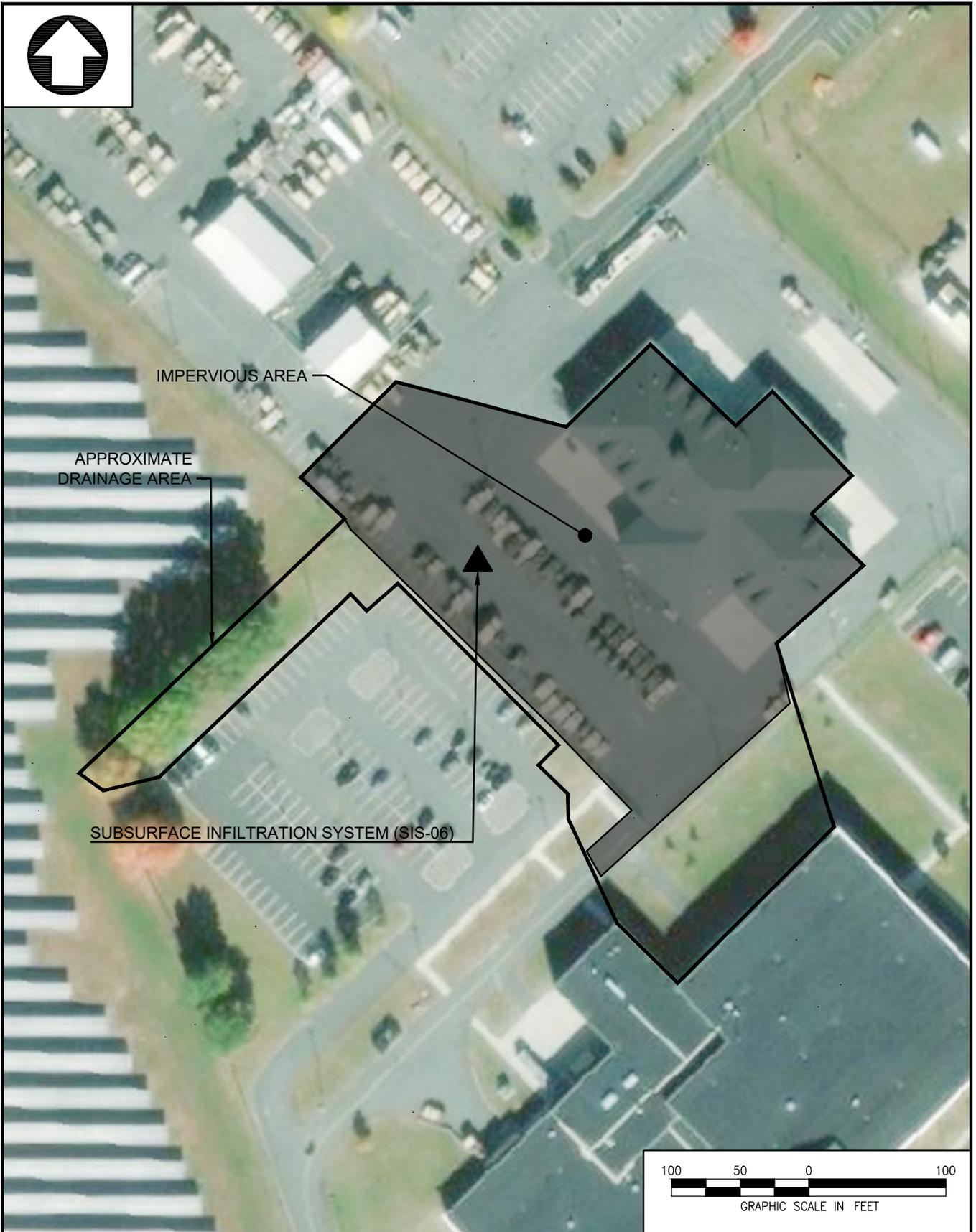
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.96 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.03 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	27.64 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	17529 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	2.46 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	26.54 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	1.99 ac
Design Storage Volume	17529 ft <sup>3</sup>
Nitrogen removed	26.54 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-06] 12/20/16



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**STRUCTURAL BMP TRACKING  
 SIS-06**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 21
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 06**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.91 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.68 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	27.07 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	14150 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	2.00 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	96 %	Percent nitrogen removal efficiency
<i>N</i>	25.98 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	2.59 ac
Design Storage Volume	14150 ft <sup>3</sup>
Nitrogen removed	25.98 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-07] 12/20/16



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**STRUCTURAL BMP TRACKING  
SIS-07**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 22
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 07**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

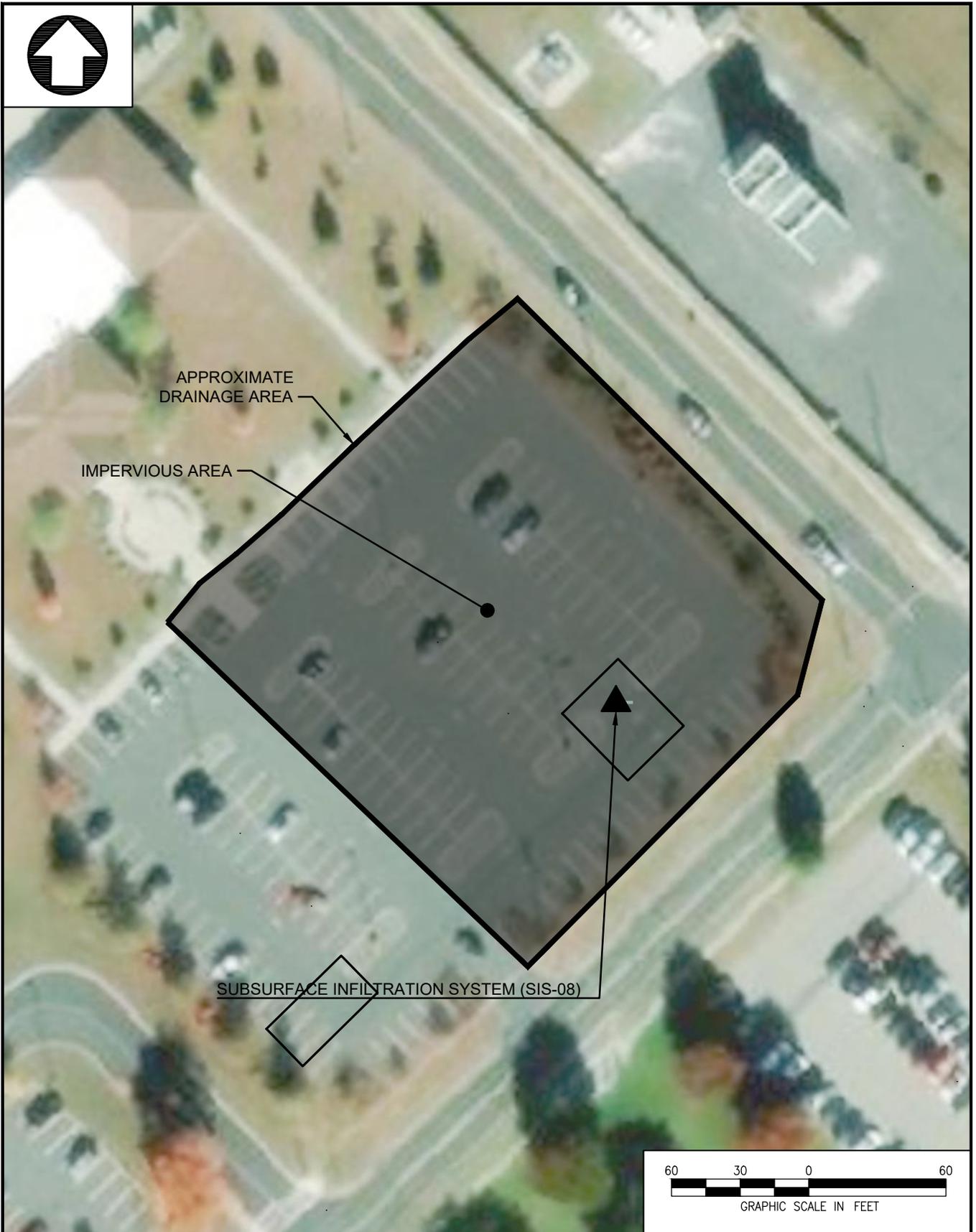
**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
	<i>IA</i>	1.16 ac Impervious Area (calculated in AutoCad)
	<i>PA</i>	0.00 ac Pervious Area HSG A (calculated in AutoCad)
	$ER_{IA}$	14.10 lbs/ac/yr Impervious area export rate (constant)
	$ER_{PA}$	0.3 lbs/ac/yr Pervious area export rate for HSG A (constant)
	<i>N Load<sub>total</sub></i>	16.29 lbs/yr Total annual BMP nitrogen load
	$V_{pond}$	6463.6 ft <sup>3</sup> Storage volume of pond
	$V_{IA-in}$	1.54 in Contributing impervious area (from iterative process in Appendix)
	$N_{removal}$	91 % Percent nitrogen removal efficiency
	<i>N</i>	14.83 lbs/yr Nitrogen removed annually

2. Results

Total Area Treated	1.16 ac
Design Storage Volume	6463.6 ft <sup>3</sup>
Nitrogen removed	14.83 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-08] 12/20/16



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**STRUCTURAL BMP TRACKING  
SIS-08**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 23
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 08**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	1.01 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.00 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	14.23 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	3080 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	0.84 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	84 %	Percent nitrogen removal efficiency
<i>N</i>	11.96 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	1.01 ac
Design Storage Volume	3080 ft <sup>3</sup>
Nitrogen removed	11.96 lbs/yr



FILE PATH: \\WARWICK\FPI\PROJECTS\62943.08 AFRC SITES\WESTOVER\CAD\WESTOVER BMP TRACKING.DWG [SIS-09] 12/20/16



**EA Engineering, Science, and Technology, Inc., PBC**  
 Hunt Valley Center  
 225 Schilling Circle, Suite 400  
 Hunt Valley, Maryland 21031  
 (410) 584-7000

**WESTOVER AIR RESERVE BASE  
 MS4 STORMWATER  
 MANAGEMENT PROGRAM**  
 Chicopee, Massachusetts

**STRUCTURAL BMP TRACKING  
 SIS-09**

DATE: JUNE 2020	PROJECT NUMBER: 62943.08	DESIGNED BY: ND	DRAWN BY: ND	CHECKED BY: TLM	PROJECT MGR.: BY	Appendix O - Fig. 23
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**CLIENT:** Westover Air Reserve Base  
**PROJECT:** MS4 Stormwater Management Program  
**NUMBER:** 62943.08

**Prepared By:** ND **Date:** 06/25/20  
**Reviewed By:** TLM **Date:** 06/25/20

**MS4 SWMP BMP 7e: Structural BMP Tracking**

**Basin:** **Subsurface Infiltration System 09**

**Permit Citation:** 2016 Final Permit Application F Part B.I.1.c.iii for Nitrogen TMDL Requirements and Appendix H Attachment 1

**Purpose:** Per the 2010 final permit, Westover ARB is required to track structural stormwater BMPs which 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 dry detention basins, and water quality swales. Tracking shall estimate the nitrogen removal by the structural BMP, and document the BMP type, total acres treated, design storage volume, and estimated nitrogen removed in mass per year.

**Methodology:** MA MS4 General Permit, Appendix H, Attachment 1

**BMP Type:** Subsurface Infiltration System (SIS)

**Solution:**

1. Calculate BMP nitrogen load

Eq. 1	$BMP\ N\ load = IA * ER_{IA} + PA * ER_{PA}$	
<i>IA</i>	0.49 ac	Impervious Area (calculated in AutoCad)
<i>PA</i>	0.00 ac	Pervious Area HSG A (calculated in AutoCad)
$ER_{IA}$	14.10 lbs/ac/yr	Impervious area export rate (constant)
$ER_{PA}$	0.3 lbs/ac/yr	Pervious area export rate for HSG A (constant)
<i>N Load<sub>total</sub></i>	6.86 lbs/yr	Total annual BMP nitrogen load
$V_{pond}$	2288 ft <sup>3</sup>	Storage volume of pond
$V_{IA-in}$	1.30 in	Contributing impervious area (from iterative process in Appendix)
$N_{removal}$	88 %	Percent nitrogen removal efficiency
<i>N</i>	6.04 lbs/yr	Nitrogen removed annually

2. Results

Total Area Treated	0.49 ac
Design Storage Volume	2288 ft <sup>3</sup>
Nitrogen removed	6.04 lbs/yr

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**Appendix P**  
**Annual Reports**

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**Year 1 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**Reporting Period: May 1, 2018-June 30, 2019**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\**

*Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed.*

**Part I: Contact Information**

Name of Municipality or Organization:

EPA NPDES Permit Number:

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

Fax Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address and an explanation of why it is not posted on the web:

## Part II: Self Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

<u>Impairment(s)</u>				
<input type="checkbox"/>	Bacteria/Pathogens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Solids			
<u>TMDL(s)</u>				
<i>Out State</i>	<input type="checkbox"/>	Long Island Sound - Nitrogen	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	
	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Clear Impairments and TMDLs

Next, check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.

### Year 1 Requirements

- Develop and begin public education and outreach program [For details, see MCM 1 Public Education later in this document.](#)
- Identify and develop inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years [For details, see MCM 3 IDDE later in this document.](#)
- The SSO inventory is attached to the email submission
- The SSO inventory can be found at the following website:

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>

- Develop written IDDE plan including a procedure for screening and sampling outfalls ([Written IDDE procedures are due 30 June 2022; Westover has not yet completed this task.](#))

- IDDE ordinance complete.

[Being a non-traditional MS4 who does not have the power to create ordinances or city laws, the MS4 Permit allows Westover to develop local policies and procedures in lieu of ‘ordinances’. An Air Force Instruction \(AFI\) is a documented instruction for members of the Air Force intended for use by active duty, guard, and reserve members and associated civilians. Westover has an existing AFI called 32-1067 Water and Fuel Systems which requires an IDDE program. Chapter 4.3.1.4. states “Air Force installations shall conduct cross-connections and illicit discharge inspections/ elimination/ construction/ repair.”](#)

- Identify each outfall and interconnection discharging from MS4, classify into the relevant category, and priority **rank** each catchment for investigation
- The priority ranking of outfalls/interconnections is attached to the email submission
- The priority ranking of outfalls/interconnections can be found at the following website:

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>

The current ranking results are: seven (7) High Priority outfalls; one (1) Low Priority outfall; zero (0)

Problems outfalls; zero (0) Excluded outfalls. The aforementioned seven outfalls were deemed 'high' priority only due to the discharge to the Chicopee State Park Beach. If it were not for the discharge to a Recreational Facility, the outfalls would have been classified as 'low' priority according to the Permit-provided formula for ranking.

- Construction/ Erosion and Sediment Control (ESC) ordinance complete
- Develop written procedures for site inspections and enforcement of sediment and erosion control measures
- Develop written procedures for site plan review
- Keep a log of catch basins cleaned or inspected [The BOS contractor's routine reports, called Contract Deliverables, containing catch basin cleaning details and inspection results will serve as the permit-required "log" stipulated in 2.3.7.a.iii.2.]
- Complete inspection of all stormwater treatment structures

### Annual Requirements

- Annual opportunity for public participation in review and implementation of SWMP
- Comply with State Public Notice requirements
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- All curbed roadways have been swept a minimum of one time per year

### **Bacteria/ Pathogens**

Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

#### *Public Education and Outreach\**

- Annual message encouraging the proper management of pet waste, including noting any existing ordinances where appropriate [For details, see summary block on Pet Waste in the Public Education section of this report.]
- Permittee or its agents disseminate educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time [For details, see summary block on Pet Waste in the Public Education section of this report.]
- Provide information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria [For details, see summary block on Septic Systems in the Public Education section of this report.]

\* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)

### **Chloride [N/A to Westover]**

#### Annual Requirements

##### *Public Education and Outreach*

- Include an annual message in November/ December to private road salt applicators and commercial industrial site owners on the proper storage and application rates of winter deicing material, along with the steps that can be taken to minimize salt use and protect local waterbodies

**Nitrogen**Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)*Public Education and Outreach\**

- Distribute an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers [For details, see summary block on Lawn Care in the Public Education section of this report.]
- Distribute an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate [For details, see summary block on Pet Waste in the Public Education section of this report.]
- Distribute an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter [For details, see summary block on Lawn Care in the Public Education section of this report.]

\* *Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increase street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall) [Long-term Base Operating Service Contractors sweep all roads and parking lots a minimum of one time per month and sweep the portions of the airport airfield daily.]

*Potential structural BMPs*

Any structural BMPs listed in Table 3 of Attachment 1 to Appendix H already existing or installed in the regulated area by the permittee or its agents shall be tracked and the permittee shall estimate the

- nitrogen removal by the BMP consistent with Attachment 1 to Appendix H. Document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP in each each annual report [Per Permit Part 1.10.3, deadlines in Appendix H are extended by two (2) years. The tracking must be completed in 2020 and then updated annually thereafter.]

**Phosphorus [N/A to Westover]**Annual Requirements (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)*Public Education and Outreach\**

- Distribute an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorus-free fertilizers
- Distribute an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Distribute an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

\* *Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increase street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

*Potential structural BMPs*

Any structural BMPs listed in Attachment 3 to Appendix F already existing or installed in the regulated

- area by the permittee or its agents shall be tracked and the permittee shall estimate the phosphorus removal by the BMP consistent with Attachment 1 to Appendix H. Document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorus removed in mass per year by the BMP in each each annual report

### **Solids, Oil and Grease (Hydrocarbons), or Metals**

#### Annual Requirements

##### *Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increase street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads [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.]

- 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 [For details, see the summary block on Catch Basins in the Good Housekeeping section of this report.]

#### **Charles River Watershed Phosphorus TMDL [N/A to Westover]**

- Begin Phase 1 Phosphorus Control Plan (PCP)

#### **Lake and Pond Phosphorus TMDL [N/A to Westover]**

- Begin Phase 1 Lake Phosphorus Control Plan (LPCP)

Use the box below to input additional details on any unchecked boxes above or any additional information you would like to share as part of your self assessment:

### Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

Yes  No

If yes, describe below, including any relevant impairments or TMDLs:

## Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

### MCM1: Public Education

Number of educational messages completed during the reporting period: 0

Westover has created a Non-traditional MS4 Education Program by selecting the responsible office, target audiences, and message topics. Westover will distribute one message within the 6-yr term of 2017-2023; since this message has not been issued yet, Permittee did not check the box within this document under “Year 1 Requirements”.

Unlike a traditional MS4, Westover does not have residences (i.e., Military Family Housing), and thus there is no residential lawn maintenance (Westover manages its land as documented in the Westover Integrated Natural Resources Management Plan and Vegetative Management Plan.).

As shown in below summary blocks, the first BMP is intended for the education of industrial users which, at Westover, includes employees, tenants, and contractors. Westover houses many shops that are industrial in nature. The remaining blocks are included here to display the reason other potential audiences do not need additional education messages.

Below, report on the educational messages completed during the first year. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

In the NOI, educational messages were proposed to be issued to Developers and Construction Contractors, however after further evaluation, it was deemed not necessary. Please see the below summary block pertaining to Developers.

Add an Educational Message

<b>BMP 1: Industrial Users (including Employees &amp; Tenants &amp; Contractors)</b>	<b>MCM: Public Education Message</b>
<b>Permit Citation:</b> 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><b>Description:</b> 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"> <li>• auto repair, auto washing</li> <li>• 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)</li> <li>• storage of potential pollution-generating materials (emphasize pollution prevention)</li> <li>• management of waste materials and dumpsters (cover and pollution prevention)</li> <li>• management of parking lot surfaces (sweeping)</li> </ul>	

<p>Existing training already takes place under the Multi Sector General Permit, whereby Environmental Staff gives an annual presentation on stormwater pollution prevention to users who might affect stormwater.</p> <p>In the future additional stormwater pollution prevention topics can be incorporated into the education program.</p>
<p><b>Targeted Audience:</b> Base organizations that engage in the Industrial activities as listed in MS4 Permit Section 2.3.2.d</p>
<p><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>
<p><b>Measurable Goal and Deadline:</b></p> <p><input type="checkbox"/> Distribute one message within the 6-yr term of 2017-2023.</p>
<p><b>Documentation:</b> The message will be attached to this plan (Appendix F) and to the Annual Report for the reporting year in which it occurred.</p>

<p><b>Education Message **NOT NEEDED**</b></p> <p><b>Developers</b></p>	<p><b>MCM: Public Education</b></p>
<p><b>Permit Citation:</b> 2016 Final Permit Part 2.3.2 as modified by Part 1.10.3.a for new permittees and Part 5.1.1 for non-traditional MS4s.</p>	
<p><b>Description:</b> In a typical MS4, developers may be contracted by anyone all across the town, however Westover is a non-traditional MS4 and the Base Civil Engineer, through the procurement mechanisms of the Contracting Office, is the only entity who can enter into agreements with architects, engineers, and construction developers. The Base Civil Engineer can only direct developers by way of contracts. Contracts are the administrative vehicle to provide directives to developers on the topics of: proper sediment and erosion control management practices; information about LID principles and technologies; information about EPA’s construction general permit (CGP); and information about the EPA Construction General Permit. Since education and instruction is carried out by way of contracts, design meetings, pre-construction meetings, and construction meetings, the Base will not need to issue additional messages to Developers.</p> <p>Education can also be a part of BMP 4 Written Procedures for Reviewing Design &amp; Site Plans and BMP 5 Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project.</p>	
<p><b>Status:</b> As explained above, issuance of additional education messages to Developers is not needed.</p>	

<p><b>Education Message **NOT NEEDED**</b></p> <p><b>Appendix F Message on Lawn Care, Pet Waste, &amp; Fertilizers</b></p>	<p><b>MCM: Public Education</b></p>
<p><b>Permit Citation:</b> 2016 Final Permit Appendix F Part B.I.1.a.i.1. Part 1.10.3.b extends the deadline by 2 years.</p>	
<p><b>Description:</b></p> <p>Appendix F requires additional public education, namely the distribution of two (2) annual messages regarding pet waste, disposal of grass clippings, use of slow-release fertilizers, and disposal of leaf litter. The Permit states that the requirement kicks in in 2020, however Westover’s handling of grass clippings and leaf litter does not warrant additional education.</p>	

At Westover, 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 is manifested through contract modifications. The contractor’s lawn care performance is monitored through government officials called QAEs (quality assurance evaluator). Instructions for the contractor can only be communicated through the QAEs and Base Contracting Officer.

Base 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) without authorization can not enter.

**Status:** As explained above, additional education regarding grass clippings/pet waste/leaf litter is not needed.

<p><b>Education Message **NOT NEEDED**</b></p> <p><b>Appendix H Message on Septic System Maintenance</b></p>	<p><b>MCM: Public Education</b></p>
<p><b>Permit Citation:</b> 2016 Final Permit Appendix H Part III.2.a.i. Part 1.10.3.a extends the deadline by 2 years. “All deadlines for discharges to water quality limited waters without a TMDL under part 2.2.2 shall be extended by two (2) years.”</p>	
<p><b>Description:</b> Appendix H requires additional public education, namely the distribution of one (1) annual message regarding septic system maintenance. This requirement commences in 2020, however Westover’s operation and maintenance of septic systems does not warrant additional education. At Westover, the Federal Government is the sole owner of a known quantity of septic systems on Base. 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. The contractor’s lawn care performance is monitored through government officials called QAEs (quality assurance evaluator). Instructions for the contractor can only be communicated through the QAEs and Base Contracting Officer.</p>	
<p><b>Status:</b> As explained above, additional education regarding septic system maintenance is not needed.</p>	

### MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) during the reporting period:

The SWMP has been given to the Office of Public Affairs and posted on Westover’s internet site.

Was this opportunity different than what was proposed in your NOI? Yes  No

Storm Water Manager did not realize that posting the SWMP on the internet could become an opportunity for public participation in review of SWMP.

Describe any other public involvement or participation opportunities conducted during the reporting period:

None during this reporting period.

### MCM3: Illicit Discharge Detection and Elimination (IDDE)

#### Sanitary Sewer Overflows (SSOs)

Below, report on the number of SSOs identified in the MS4 system and removed during this reporting period.

Number of SSOs identified:

Number of SSOs removed:

Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified since 2013.

Total number of SSOs identified:

Total number of SSOs removed:

#### MS4 System Mapping

Describe the status of your MS4 map, including any progress made during the reporting period:

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.

STATUS: Phase I Mapping due by 30 June 2023. [This has been completed.](#)

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.

STATUS: We have spatial locations, pipes, manholes, catch basins, but still need to update Phase II Mapping upon completion of any catchment investigations and complete by 30 June 2031.

#### Screening of Outfalls/Interconnections

If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.

- The outfall screening data is attached to the email submission
- The outfall screening data can be found at the following website:

Below, report on the number of outfalls/interconnections screened during this reporting period.

Number of outfalls screened: **0**

*Below, report on the percent of total outfalls/ interconnections screened to date.*

Percent of total outfalls screened: **0**

For new Permittee, written procedures for Dry Weather Screening is due June 2022 and the subsequent screening of outfalls/interconnections must be completed by June 2024. To date, Westover has not completed MS4 dry weather screening.

Please note Westover's NPDES background. Westover has been monitoring our outfalls and industrial activity areas since 2000 when EPA granted coverage under the MSGP for all of our outfalls. MSGP monitoring program has morphed over time. In 2000 chemical analysis of stormwater samples was conducted due to Westover being part of the Airport Sector, but now monitoring consists only of visual monitoring. MSGP visual monitoring from 2000-present took place during both wet and dry weather occasions.

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. During engineering project carried out by CH2Mhill, physical characteristics for most of our stormwater conveyance system were ascertained.

### **Catchment Investigations**

*If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.*

- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed during this reporting period.*

Number of catchment investigations completed this reporting period:

*Below, report on the percent of catchments investigated to date.*

Percent of total catchments investigated:

*Optional: Provide any additional information for clarity regarding the catchment investigations below:*

Zero "problem" outfalls identified during the initial ranking.  
 Per permit deadlines, Catchment Investigations of High and Low Priority Outfalls must be completed by 30 June 2031. Written catchment investigation procedures are due 30 June 2022; Westover has not yet completed this task.  
 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. Since Westover has a good understanding of the assets, we will be able to identify the required manholes for inspection and will not need to open over a great number of manholes.

### **IDDE Progress**

*If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.*

- The illicit discharge removal report is attached to the email submission

The illicit discharge removal report can be found at the following website:

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed *during this reporting period*.

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed: N/A

Below, report on the *total* number of illicit discharges identified and removed *to date*. At a minimum, report on the number of illicit discharges identified and removed *since the effective date of the permit*.

Total number of illicit discharges identified:

Total number of illicit discharges removed:

*Optional:* Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

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. The only illicit connection the Base has is rainwater possibly entering the sanitary sewer system at Hangars 1, 3, 5, 7, and/or 9. Apart from aforementioned Hangar roof drains potentially discharging to the sanitary system, Westover does not have any connections between our sanitary and storm lines.

**Employee Training**

Describe the frequency and type of employee training conducted during the reporting period:

BMP 3e: Employee Training	MCM: IDDE
<b>Permit Citation:</b> 2016 Final Permit Part 2.3.4.11	
<b>Description:</b> The Base Environmental Office (439 MS/CEV) will perform IDDE program training, including how to recognize illicit discharges and SSOs.	
<b>Targeted Audience:</b> Employees with IDDE Program responsibilities.	
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)	
<b>Measurable Goal and Deadline:</b> <input type="checkbox"/> Perform annual training to all applicable employees. The Part 1.10.3 deadline extension pertains to training as well. Develop IDDE Program written procedures (and training) by 30 June 2022 (within 4 years of permit effective date).	
<b>Documentation:</b> The training will be attached to the SWMP (Appendix J) and to the Annual Reports.	

**MCM4: Construction Site Stormwater Runoff Control**

Below, report on the construction site plan reviews, inspections, and enforcement actions completed during this reporting period.

Number of site plan reviews completed:

New ISO Hangar Project managed by Army Corps of Engineers (greater than 1 acre)  
 New Indoor Firing Range Project managed by Army Corps of Engineers (greater than 1 acre)

Number of inspections completed:

Construction has not yet begun.

Number of enforcement actions taken:

<b>BMP 4b: Written Procedures for Inspections by Government Officials</b>	<b>MCM: Construction Sites</b>
<b>Description:</b> ETL 14-1 Construction and Operation and Maintenance Guidance for Storm Water Systems provides procedures and checklists for all construction sediment and erosion control inspections.	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goals and Deadlines:</b> <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>ETL 14-1 is in effect at Westover ARB and this requirement is fully satisfied.</i>	
<b>Documentation/Location:</b> The latest version of ETL 14-1 is located at the following web address: <a href="https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1">https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1</a>	

<b>BMP 4c: Written Procedures for Reviewing Design &amp; Site Plans</b>	<b>MCM: Construction Sites</b>
<b>Description:</b> <b>AFI 32-1023 Designing and Constructing Military Construction Projects</b> Chapter 2.3.2 requires a comprehensive design and review process for all construction projects at Westover ARB. This process includes reviews by the designated Design Agent, Design Manager, Base Civil Engineer, and Major Command. The Base Civil Engineer ensures compliance with relevant environmental permits, including NPDES CGP and the 2016 Final Permit. ETL 14-1 provides design guidance for erosion and sediment controls.	
<b>Responsible Department:</b> Base Civil Engineer	
<b>Measurable Goals and Deadlines:</b> <input checked="" type="checkbox"/> Develop Site Plan Review written procedures by 30 June 2021. <i>AFI32-1023 is in effect at Westover ARB and this requirement is fully satisfied.</i>	
<b>Documentation/Location:</b> The latest version of AFI32-1023 is located at the following web address: <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf</a>	

**MCM5: Post-Construction Stormwater Management in New Development and**

## Redevelopment

### Ordinance Development

Describe the status of the post-construction ordinance required to be complete in year 2 of the permit term:

**Please see below. Each summary block has sections called ‘Description and Measurable Goal/Deadline’ where BMP status is provided.**

<b>BMP 5b: Develop Policy to Enact Design Requirements for Runoff Management in New Development/ Redevelopment Project – For sites that disturb 1 acre or more</b>	<b>MCM: POST Construction Stormwater Management</b>
<p><b>Description:</b> The Base’s design requirements must be <b>at least as stringent</b> 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"> <li><input type="checkbox"/> Address nitrogen removal BMP requirements of Appendix F Part B.I.1.a.i.2</li> <li><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.</li> <li><input 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”.</li> </ul> <p>ETL 14 – 1 Chapter 5.2.2 provides limited guidance on EISA 438.</p> <p>EPA has developed a guidance document that is appropriate for Westover to adhere to, namely the Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act (PDF).</p>	
<p><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b></p> <p><input type="checkbox"/> Develop a written policy by 30 June 2021.</p>	
<p><b>Documentation/Location:</b></p> <p>Reference to the written policy will be included here once the policy is developed.</p> <p>EISA 438 can be found at the following web address:  <a href="https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act">https://www.epa.gov/nps/stormwater-management-federal-facilities-under-section-438-energy-independence-and-security-act</a></p> <p>EPA’s EISA guidance document can be found at the following website:  <a href="https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf</a></p>	

**As-built Drawings**

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites required to be complete in year 2 of the permit term:

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<b>BMP 5c: Written Procedures for As-built Drawing Submittals &amp; Long Term O&amp;M</b> <b>(For sites that disturb 1 acre or more)</b>	<b>MCM: POST Construction Stormwater Management</b>
<p><b>Description:</b></p> <p>The Base will implement a program for:</p> <ul style="list-style-type: none"> <li><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"> <li>• 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. This process includes reviews by the designated Design Agent, Design Manager, Base Civil Engineer, and Major Command.</li> </ul> </li> <li><input checked="" type="checkbox"/> Long-term operation and maintenance of stormwater management structures                             <ul style="list-style-type: none"> <li>• Written procedures for long-term O&amp;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.</li> <li>• ETL 14-1 Construction and Operation and Maintenance Guidance for Storm Water Systems.</li> </ul> </li> </ul>	
<p><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b></p> <p><input checked="" type="checkbox"/> Develop a written procedure by 30 June 2021. BOS contract execution of stormwater treatment structure O&amp;M and AFI 32-1023’s policy for As-Build Submittals are both already in effect.</p>	
<p><b>Documentation/Location:</b></p> <p>The latest version of AFI32-1023 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1023/afi32-1023.pdf</a></p> <p>The latest version of ETL 14-1 is located at the following web address:  <a href="https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1">https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1</a></p> <p><u><a href="#">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.</a></u></p>	

**Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

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<b>BMP 5d: Report Assessing Street Design and Parking Lot Guidelines</b>	<b>MCM: Post Construction Stormwater Management</b>
<p><b>Description:</b> 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.</p>	
<p><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>	
<p><b>Measurable Goals and Deadlines:</b></p> <p><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></p>	
<p><b>Documentation/Location:</b></p> <p>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.</p> <p>The latest versions of UFC 3-250-01 and UFC 3-210-10 are available at the following web addresses:</p> <p><a href="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-3-250-01</a></p> <p><a href="https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10">https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10</a></p>	

### **Green Infrastructure Report**

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

[This report is not applicable to non-traditional permittees \(Permit Part 5.1.3\).](#)

### **Retrofit Properties Inventory**

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

<b>BMP 5c: List of Retrofit Opportunities</b>	<b>MCM: Post Construction Stormwater Management</b>
<p><b>Description:</b> 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.</p>	
<p><b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)</p>	
<p><b>Measurable Goal and Deadline:</b></p> <p><input type="checkbox"/> Compile a list of five potential retrofit opportunities by 30 June 2024.</p>	

**Documentation/Location:**

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

## MCM6: Good Housekeeping

### Catch Basin Cleaning

Describe the status of the catch basin cleaning optimization plan:

**Please see below. Each summary block has sections called ‘Description and Measurable Goal/Deadline’ where BMP status is provided.**

<b>BMP 6d: Catch Basin Cleaning Program</b>	<b>MCM: Written Procedures for O&amp;M of Catch Basins to Minimize Sediment Discharge and Achieve Good Housekeeping / P2</b>
<p><b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.iii.2 as modified by 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><b>Description:</b> Procedures for operation and maintenance of stormwater infrastructure are already established at Westover ARB. This program is documented by ETL 14-1 Construction and Operation and Maintenance Guidance for Storm Water Systems and enforced by AFI32-1067. Westover ARB has a catch basin cleaning program authorized by AFI32-1067 and ETL 14-1 and <b>implemented under the BOS contract, Tab F, Real Property Maintenance (F5.25.3)</b>. 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 prepares a report summarizing these activities and provides inspection results to Westover ARB staff.</p>	
<p><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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>(Written O&amp;M procedures originally due within 2 yrs of permit effective date, then Part 1.10.3 extended the deadline by 2 years, thus changing due date to 2022; nonetheless written procedure has been completed as mentioned above.)</p>	
<p><b>Documentation/Location:</b></p> <p>The latest version of AFI32-1067 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf</a></p> <p>The latest version of ETL 14-1 is located at the following web address:  <a href="https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1">https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1</a></p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.</p>	

*If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:*

A requirement of the MS4 Permit is the optimization of inspections and cleanings in order to:

- 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 in this SWMP in the construction BMP chapter and post-construction BMP chapter.
- 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. ”

- The catch basin cleaning optimization plan or schedule is attached to the email submission. Both plans to focus on catch basin in construction zones so that they are a priority and also the plan to ensure catch basins are not 50% full of sediment are already being implemented. See above paragraph for the procedures put in place to optimize catch basin cleaning. The BOS contractor prepares a report summarizing their activities and provides inspection results.
- The catch basin cleaning optimization plan or schedule can be found at the following website:

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins during this reporting period.*

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

*Below, report on the total number of catch basins in the MS4 system, if known.*

Total number of catch basins:

*If applicable:*

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

N/A

**Street Sweeping**

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

<b>BMP 6f: Street and Parking Lot Sweeping Program</b>	<b>MCM: Written Procedures for Street Sweeping to Minimize Sediment Discharge and Achieve Good Housekeeping / P2</b>
<p><b>Description:</b> Westover ARB has a street and parking lot cleaning program as required by AFI32-1067 and ETL 14-1 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.</p> <p>For reference, the following are excerpts from the BOS contract:</p> <p style="padding-left: 40px;">F6.3 Pavement Maintenance. This subsection 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. Additional airfield pavement sweeping requirements, above the 20% each day, will be ordered under the Labor for Service Call CLIN of the contract. (See contract section F-TE-1, SDSF27 and reference F-TE-7 for maps)</p> <p style="padding-left: 40px;">F6.3.7 Roads and Parking Lots Sweeping: 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. (See contract section F-TE-1, SDSF28)</p>	
<p><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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><b>Documentation/Location:</b></p> <p>The latest version of AFI32-1067 is located at the following web address:  <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf</a></p> <p>The latest version of ETL 14-1 is located at the following web address:  <a href="https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1">https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1</a></p> <p>The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F6.3.7.</p>	

Report on street sweeping completed during the reporting period using **one** of the three metrics below.

☉ Number of miles square feet cleaned:

Base Proper: 5,176,881 sq ft per month (minimum), resulting in 62 million sq ft swept within 12 months. Airfield: minimum of 12,656,477 sq ft daily, resulting in 4.6 billion sq ft swept within 12 months.

- Volume of material removed:  [UNITS]
- Weight of material removed:  [UNITS]

*If applicable:*

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

**Winter Road Maintenance**

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

<b>BMP 6g: Snow Plan / Winter Road Maintenance</b>	<b>MCM: Written Procedures for Winter Road Maintenance to Minimize Pollutant Discharge and Achieve Good Housekeeping / P2</b>
<b>Description:</b> Westover ARB has a winter road maintenance program as required by AFI32-1002 Snow and Ice Control, documented by the Westover ARB Snow Plan, and <b>implemented under BOS contract, Tab F, Real Property Maintenance (F6.3.5)</b> . The specific policies, procedures, and responsibilities for the Winter Road Maintenance Program are contained in the Snow Plan.	
<b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.	
<b>Measurable Goal and Deadline:</b> <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>	
<b>Documentation/Location:</b> The latest version of AFI32-1002 is located at the following web address: <a href="https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1002/afi32-1002.pdf">https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1002/afi32-1002.pdf</a> 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.	

**Inventory of Permittee-Owned Properties**

Describe the status of the inventory, due in year 2 of the permit term, of permittee-owned properties, including parks and open spaces, buildings and facilities, and vehicles and equipment, and include any updates

Westover is supported by our Real Property Office that meticulously accounts for all of our buildings, facilities, parking lots, and many more assets. Our assets list has already been completed, and for the purposes of the MS4 Permit, it will be used to create a new list of areas and facilities listed in Permit Part 2.3.7.a.ii.



## **O&M Procedures for Parks and Open Spaces, Buildings and Facilities, and Vehicles and Equipment**

Describe the status of the operation and maintenance procedures, due in year 2 of the permit term, of permittee-owned properties (parks and open spaces, buildings and facilities, vehicles and equipment) and include maintenance activities associated with each:

<b>BMP 6a: Parks and Open Spaces</b>	<b>MCM: Written Procedures for O&amp;M of Parks/Open Spaces to Achieve Good Housekeeping / P2</b>
<p><b>Permit Citation:</b> 2016 Final Permit Part 2.3.7.a.i as modified by Part 1.10.3.a for new permittees and Appendix F Part B.I.1.a.3 for Nitrogen TMDL Requirements. Written O&amp;M procedures for parks and open spaces originally due within 2 yrs of permit effective date, then Part 1.10.3 extends deadline by 2 years, thus ultimately due 2022; nonetheless written procedures for open spaces has already by satisfied.</p>	
<p><b>Description:</b> 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><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the Base Operations Support (BOS) contractor.</p>	
<p><b>Measurable Goal and Deadline:</b></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. This requirement is satisfied.</i></p> <p><input type="checkbox"/> Within this BMP block, include the location of the written/digital inventory.</p>	
<p><b>Documentation/Location:</b></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>	

<b>BMP 6b: Buildings and Facilities</b>	<b>MCM: Written Procedures for O&amp;M of Buildings to Achieve Good Housekeeping / P2</b>
<p><b>Description:</b> 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.</p>	

<b>Responsible Department:</b> Base Civil Engineer
<p><b>Measurable Goal and Deadline:</b></p> <p><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. This requirement is satisfied.</i></p> <p><input type="checkbox"/> Within this BMP block, include the location of the written/digital inventory.</p>
<p><b>Documentation/Location:</b></p> <p>The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.</p>

<b>BMP 6c: Vehicle and Equipment Storage</b>	<b>MCM: Written Procedures for O&amp;M of Vehicle Storage Areas to Achieve Good Housekeeping / P2</b>
<p><b>Description:</b> 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.</p>	
<p><b>Responsible Department:</b> Base Civil Engineer</p>	
<p><b>Measurable Goal and Deadline:</b></p> <p><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. This requirement is satisfied.</i></p> <p><input type="checkbox"/> Within this BMP block, include the location of the written/digital inventory.</p>	
<p><b>Documentation/Location:</b></p> <p>The latest version of the SWPPP, SPCC, and FRP are maintained by the Base Environmental Office and are available for public review upon request.</p>	

**Stormwater Pollution Prevention Plan (SWPPP)**

Describe the status of any SWPPP, due in year 2 of the permit term, for permittee-owned or operated facilities including maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater:

<b>BMP 6h: Stormwater Pollution Prevention Plan</b>	<b>MCM: Good Housekeeping &amp; Pollution Prevention</b>
<p><b>Permit Citation:</b> 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</p>	

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.”
<b>Description:</b> Westover ARB as a whole is subject to the EPA MSGP and therefore maintains and annually updates a SWPPP.
<b>Responsible Department:</b> Base Environmental Office (439 MS/CEV)
<b>Measurable Goal and Deadline:</b> <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>
<b>Documentation/Location:</b> The latest version of the SWPPP is maintained by the Base Environmental Office and is available for public review upon request.

Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

### **O&M Procedures for Stormwater Treatment Structures**

Describe the status of the written procedure for stormwater treatment structure maintenance:

<b>BMP 6e: Swales, Detention Basins, Infiltration (treatment) Structures</b>	<b>MCM: Written Procedures for O&amp;M of Treatment Structures to Minimize Sediment Discharge and Achieve Good Housekeeping / P2</b>
<p><b>Description:</b> Westover ARB maintains stormwater infrastructure in accordance with AFI32-1067 and ETL 14-1. Attachments 3 to 12 of ETL 14-1 provide maintenance procedures and inspection checklists for stormwater infrastructure. These procedures are implemented under the BOS contract Tab F, Real Property Maintenance (F5.25) which states:</p> <p>F5.25.6 Storm Water Detention Ponds and Spill Containment Ponds: The KTR 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&amp;M service performed shall be provided to Contractor’s Officer Representative and Westover Environmental Office within 5 days after the service is completed. All repairs will be ordered under the Labor for Service Call CLIN of the contract. (See F-TE-3, F39)</p>	
<p><b>Responsible Department:</b> Monitored by the Base Civil Engineer and implemented by the BOS contractor.</p>	
<p><b>Measurable Goal and Deadline:</b>  <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>	

**Documentation/Location:**

The latest version of AFI32-1067 is located at the following web address:

[https://static.e-publishing.af.mil/production/1/af\\_a4/publication/afi32-1067/afi32-1067.pdf](https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf)

The latest version of ETL 14-1 is located at the following web address:

[https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1'](https://www.wbdg.org/ffc/af-afcec/engineering-technical-letters-afetl/etl-14-1)

The specific contract mechanism for catch basin cleaning is contained in the BOS Contract, Tab F, Section F5.25.

## **Monitoring or Study Results**

### **Additional Information**

*Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.*

- Not applicable
- The results from additional reports or studies are attached to the email submission
- The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

### **Additional Information**

*Optional:* Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

### **Activities Planned for Next Reporting Period**

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 2 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

- Complete system mapping Phase I
- Begin investigations of catchments associated with Problem Outfalls
- Develop or modify an ordinance or other regulatory mechanism for post-construction stormwater runoff from new development and redevelopment
- Establish and implement written procedures to require the submission of as-built drawings no later than two years after the completion of construction projects
- Develop, if not already developed, written operations and maintenance procedures
- Develop an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; review annually and update as necessary
- Establish a written program detailing the activities and procedures the permittee will implement so that the MS4 infrastructure is maintained in a timely manner
- Develop and implement a written SWPPP for maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclose or cover storage piles of salt or piles containing salt used for deicing or other purposes
- Develop, if not already developed, written procedures for sweeping streets and municipal-owned lots
- Develop, if not already developed, written procedures for winter road maintenance including storage of salt and sand
- Develop, if not already developed, a schedule for catch basin cleaning
- Develop, if not already developed, a written procedure for stormwater treatment structure maintenance

- Develop a written catchment investigation procedure (*18 months*)

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all uncurbed streets at least annually

Provide any additional details on activities planned for permit year 2 below:

## Part V: Certification of Small MS4 Annual Report 2019

### 40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that 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.

Name: John B. Moriarty

Title: Chief, Environmental Engineering Flight

Signature:  Recoverable Signature  
 X John B Moriarty  
 JOHN B. MORIARTY  
 Chief, Environmental Engineering  
 Signed by: MORIARTY.JOHN.B.1228530170

Date: 9/30/2019

*[Signatory may be a duly authorized representative]*

*Note: When prompted during signing, save the document under a new file name.*

### Annual Report Submission

*Please submit the form electronically via email to both EPA and MassDEP by clicking on one of the links below or using the email addresses listed below. Please ensure that all required attachments are included in the email and not attached to this PDF.*

EPA: [stormwater.reports@epa.gov](mailto:stormwater.reports@epa.gov)

MassDEP: [frederick.civian@mass.gov](mailto:frederick.civian@mass.gov)

### Paper Signature:

*If you did not sign electronically above, you can print the signature page by clicking the button below.*

[Print Signature Page](#)

*Optional: If you did not sign electronically above, you may lock the form by clicking the "Lock Form" button below which will prompt you to save the locked version of the form. Save this locked version under a new file name.*

[Lock Form](#)

**Year 2 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**New Permittees**  
**Reporting Period: July 1, 2019-June 30, 2020**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\**

*Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2019 and June 30, 2020 unless otherwise requested.*

**Part I: Contact Information**

Name of Municipality or Organization:

EPA NPDES Permit Number:

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address:

## Part II: Self-Assessment

*Check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.*

### Annual Requirements

- Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice Requirements
- Kept records relating to the permit available for 5 years and made available to the public
- Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information for your self-assessment, and/or if any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

### Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted? Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>

- Yes  
 No

If yes, describe below, including any relevant impairments or TMDLs:

Outfall 004 discharges to an unnamed tributary of the Connecticut River (MA34-60; locally known as Willimansett Brook). The 2016 Integrated List of Waters listed e. coli as an additional impairment to this waterbody. The SWMP and applicable BMPs were updated in accordance with Appendix H of the 2016 Final Permit. See Section 3 of the Westover ARB SWMP.

## Part IV: Minimum Control Measures

*Part IV includes some of the metrics that will be required in upcoming annual reports. For this annual report, these metrics are optional for new permittees; please fill out any of the metrics below that you have started within this reporting period. Then, proceed to Part V.*

### MCM1: Public Education

Number of educational messages completed **during this reporting period:**

*Below, report on the educational messages completed **during this reporting period**. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.*

#### **BMP: 1a - Industrial Users (including employees, tenants, and contractors)**

Message Description and Distribution Method:

- 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 Appendix F of the SWMP); and
- Posted Environmental Management System Posters throughout base on stormwater and pollution prevention topics (see example poster in Appendix F of the SWMP).

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Message Date(s):

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

### MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period:**

The SWMP and Annual Report were posted online for public feedback. See BMP 2a and 2b in the Westover ARB SWMP.

Was this opportunity different than what was proposed in your NOI?    Yes     No

Describe any other public involvement or participation opportunities conducted **during this reporting period:**

N/A

### MCM3: Illicit Discharge Detection and Elimination (IDDE)

#### Sanitary Sewer Overflows (SSOs)

*Check off the box below if the statement is true.*

This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period.***

Number of SSOs identified:

Number of SSOs removed:

*Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified **since the effective date of the permit (July 1, 2018).***

Total number of SSOs identified:

Total number of SSOs removed:

#### MS4 System Mapping

*Below, check all that apply.*

The following elements of the Phase I map have been completed:

- Outfalls and receiving waters
- Open channel conveyances

- Interconnections
- Municipally-owned stormwater treatment structures
- Waterbodies identified by name and indication of all use impairments
- Initial catchment delineations

Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

Phase I mapping updated to represent recent construction. See BMP 3d in the Westover ARB SWMP.

**Screening of Outfalls/Interconnections**

*If conducted, please submit any outfall monitoring results **from this reporting period**. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses.*

- The outfall screening data is attached to the email submission
- The outfall screening data can be found at the following website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period**.*

Number of outfalls screened:

**Catchment Investigations**

*If conducted, please submit all data collected **during this reporting period** as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.*

- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed **during this reporting period**.*

Number of catchment investigations completed this reporting period:

*Below, report on the percent of catchments investigated **to date**.*

Percent of total catchments investigated:

*Optional: Provide any additional information for clarity regarding the catchment investigations below:*

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permittees. No screenings or catchment investigations have been conducted yet. Dry weather screening and sampling will be conducted by 30 June 2024. Catchment investigations on high and low priority outfalls will be completed by 30 June 2031. Currently, no outfalls are classified as problem outfalls. However, if future outfall ranking updates discover a problem outfall (possibly based on the results of dry weather screening), a catchment investigation on that outfall will begin earlier. See BMP 3b in the Westover ARB SWMP.

**IDDE Progress**

*If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.*

- The illicit discharge removal report is attached to the email submission
- The illicit discharge removal report can be found at the following website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed:  gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018).***

Total number of illicit discharges identified:

Total number of illicit discharges removed:

*Optional:* Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

No illicit discharges have been discovered. The deadline for IDDE written procedures for new non-traditional permittees is delayed until 30 June 2022. See BMP 3b in the Westover ARB SWMP.

**Employee Training**

Describe the frequency and type of employee training if conducted **during this reporting period:**

No illicit discharge training has been conducted yet. EPA indicated to Westover that training is not required until completion of the IDDE Program written procedures which is due to be complete by 30 June 2022. See BMP 3b and 3e in the Westover ARB SWMP.

**MCM4: Construction Site Stormwater Runoff Control**

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period.***

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

## **MCM5: Post-Construction Stormwater Management in New Development and Redevelopment**

### **Ordinance Development**

Describe the status of the post-construction ordinance required to be complete by year 3 of the permit term:

A written policy applicable to Westover ARB will be developed by 30 June 2021. See BMP 5b in the Westover SWMP.

### **As-built Drawings**

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

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, including submission of as-built drawings and development of operation and maintenance procedures. Additionally ETL 14-1 includes additional operation and maintenance requirements for projects. Both of these documents are enforced at Westover ARB. See BMP 5c in the Westover SWMP.

### **Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment including any planned or completed changes to local regulations and guidelines:

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. See BMP 5d in the Westover ARB SWMP.

### **Green Infrastructure Report**

Describe the status of the green infrastructure report, including the findings and progress towards making the practice allowable:

This report is not applicable to non-traditional permittees (2016 Final Permit Part 5.1.3).

**Retrofit Properties Inventory**

Describe the status of the inventory of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

A list of retrofit opportunities will be developed by 30 June 2023. See BMP 5c in the Westover ARB SWMP.

**MCM6: Good Housekeeping**

**Catch Basin Cleaning**

Describe the status of the catch basin cleaning optimization plan:

Procedures for operation and maintenance of stormwater infrastructure are already established at Westover AR

*If complete, attach the catch basin cleaning optimization plan or the schedule to gather information to develop the optimization plan:*

- The catch basin cleaning optimization plan or schedule is attached to the email submission
- The catch basin cleaning optimization plan or schedule can be found at the following website:

[https://static.e-publishing.af.mil/production/1/af\\_a4/publication/afi32-1067/afi32-1067.pdf](https://static.e-publishing.af.mil/production/1/af_a4/publication/afi32-1067/afi32-1067.pdf)

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period**.*

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

*Below, report on the total number of catch basins in the MS4 system, if known.*

Total number of catch basins:

*If applicable:*

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

N/A

**Street Sweeping**

Describe the status of the written procedures for sweeping streets and municipal-owned lots:

Westover ARB has a street and parking lot cleaning program as required by AFI32-1067 and ETL 14-1 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. See BMP 6f in the Westover ARB SWMP. See below for street sweeping reporting (quantified in square feet instead of miles per base procedures).

Report on street sweeping completed during the reporting period using one of the three metrics below.

- Number of miles cleaned:
- Volume of material removed:
- Weight of material removed:

*If applicable:*

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

Base Proper: 62 million square feet of street sweeping during the last reporting year. Airfield: 12.6 billion square feet of street sweeping during the last reporting year.

**O&M Procedures and Inventory of Permittee-Owned Properties**

*Below, check all that apply.*

The following permittee-owned properties have been inventoried:

- Parks and open spaces
- Buildings and facilities
- Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- Parks and open spaces
- Buildings and facilities
- Vehicles and equipment

**Winter Road Maintenance**

Describe the status of the written procedures for winter road maintenance including the storage of salt and sand:

Westover ARB has a winter road maintenance program as required by AFI32-1002 Snow and Ice Control, 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. See BMP 6g in the Westover ARB SWMP.

**Stormwater Pollution Prevention Plan (SWPPP)**

Describe the status of any SWPPP for permittee-owned or operated facilities including maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater:

Westover ARB as a whole is subject to the EPA MSGP and therefore maintains and annually updates a SWPPP. See BMP 6h in the Westover ARB SWMP.

*Below, report on the number of site inspections for facilities that require a SWPPP completed during this reporting period.*

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

**O&M Procedures for Stormwater Treatment Structures**

Describe the status of the written procedure for stormwater treatment structure maintenance:

Westover ARB maintains stormwater infrastructure in accordance with AFI32-1067 and ETL 14-1. Attachments 3 to 12 of ETL 14-1 provide maintenance procedures and inspection checklists for stormwater infrastructure. 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. See BMP 6e in the Westover ARB SWMP.

## Part V: Additional Information

### **Monitoring or Study Results**

*Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.*

- Not applicable
- The results from additional reports or studies are attached to the email submission
- The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

### **Additional Information**

*Optional:* Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

Structural BMP Tracking was completed during the reporting year, as required by Appendix F Part B.I.1.c.iii for Nitrogen TMDL requirements and Appendix H Attachment 1 of the 2016 Final Permit. See attached files and BMP 7e in the Westover ARB SWMP.

### **COVID-19 Impacts**

*Optional:* If any of the above year 2 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

### **Activities Planned for Next Reporting Period**

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 3 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

- Complete IDDE ordinance
- Complete Construction/ Erosion and Sediment Control (ESC) ordinance
- Develop written procedures for site inspections and enforcement of sediment and erosion control measures
- Develop written procedures for site plan review

Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Continue public education and outreach program

Provide any additional details on activities planned for permit year 3 below:

Implementation of post-construction stormwater policy that meets the requirements of the 2016 Final Permit is planned. See BMP 6b in the Westover ARB SWMP.

## Part VI: Certification of Small MS4 Annual Report 2020

### 40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that 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.

Name:

Title:

Signature:

Date:

*[Signatory may be a duly authorized representative]*

**Year 3 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**Reporting Period: July 1, 2020-June 30, 2021**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\**

*Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2020 and June 30, 2021 unless otherwise requested.*

**Part I: Contact Information**

Name of Municipality or Organization:

EPA NPDES Permit Number:

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address:

## Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4. Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>

**Impairment(s)**

Bacteria/Pathogens     
  Chloride     
  Nitrogen     
  Phosphorus  
 Solids/ Oil/ Grease (Hydrocarbons)/ Metals

**TMDL(s)**

*In State:*     
  Assabet River Phosphorus     
  Bacteria and Pathogen     
  Cape Cod Nitrogen  
 Charles River Watershed Phosphorus     
  Lake and Pond Phosphorus

*Out of State:*     
  Bacteria/Pathogens     
  Metals     
 Nitrogen     
 Phosphorus

Next, check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.

### Year 3 Requirements

- Inspected and screened all outfalls/interconnections (excluding Problem and Excluded outfalls)
- Updated outfall/interconnection priority ranking based on the information collected during the dry weather inspections as necessary
- Post-construction bylaw, ordinance, or other regulatory mechanism was updated and adopted consistent with permit requirements

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

### Annual Requirements

- Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice requirements
- Kept records relating to the permit available for 5 years and made available to the public
- The SSO inventory has been updated, including the status of mitigation and corrective measures implemented
  - This is not applicable because we do not have sanitary sewer
  - This is not applicable because we did not find any new SSOs

- The updated SSO inventory is attached to the email submission
- The updated SSO inventory can be found at the following website:

- Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- Provided training to employees involved in IDDE program within the reporting period
- All curbed roadways were swept at least once within the reporting period
- Updated system map due in year 2 as necessary
- Enclosed all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities
- Updated inventory of all permittee owned facilities as necessary
- O&M programs for all permittee owned facilities have been completed and updated as necessary
- Implemented all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implemented program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Inspected all permittee owned treatment structures (excluding catch basins)

*Optional:* If you would like to describe progress made on any incomplete requirements listed above, provide any additional information, and/or if any of the above annual requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

**Bacteria/ Pathogens** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements

*Public Education and Outreach\**

- Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

*\* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Westover ARB does not allow entry of pets during business hours, and all septic systems on site are owned by Westover ARB, and are operated as described in the BOS contract. Permit holders need to send out educational messages multiple times per year, however Westover is not open to the public, has no Family Housing, the BOS contract handles grass clippings, leaf litter, and there is no pet waste. (See Westover SWMP Section 4.1.2)

## **Nitrogen** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

### Annual Requirements

#### *Public Education and Outreach\**

- Distributed an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers
- Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

*\* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

#### *Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

#### *Potential structural BMPs*

Any structural BMPs listed in Table 3 of Attachment 1 to Appendix H already existing or installed in the regulated area by the permittee or its agents was tracked and the nitrogen removal by the BMP was

- estimated consistent with Attachment 1 to Appendix H. The BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP were documented.

- The BMP information is attached to the email submission
- The BMP information can be found at the following website:

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The SWMP and applicable BMPs were updated in accordance with Appendix H of the 2016 Final Permit. See Section 3 of the Westover ARB SWMP.

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. Summary: Additional education

regarding leaf litter is not needed. (See Westover SWMP Section 4.1.2)

**Solids, Oil and Grease (Hydrocarbons), or Metals**

Annual Requirements

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule that targets areas with potential for high pollutant loads
- Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicated excessive sediment or debris loadings

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

*Optional:* Use the box below to provide any additional information you would like to share as part of your self-assessment:

### **Part III: Receiving Waters/Impaired Waters/TMDL**

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted?

- Yes
- No

If yes, describe below, including any relevant impairments or TMDLs:

### Part IV: Minimum Control Measures

Please fill out all of the metrics below. If applicable, include in the description who completed the task if completed by a third party.

#### MCM1: Public Education

Number of educational messages completed during this reporting period:

Below, report on the educational messages completed during this reporting period. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

**BMP: 1a - Industrial Users (including employees, tenants, and contractors)**

Message Description and Distribution Method:

Distribute one message within the 6-yr term of 2017-2023:  
• 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 Appendix F of the SWMP); and  
• Posted Environmental Management System Posters throughout base on stormwater and pollution prevention topics (see example poster in Appendix F of the SWMP).

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Message Date(s):

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

#### MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period:**

The SWMP and Annual Report were posted online for public feedback. See BMP 2a and 2b in the Westover ARB SWMP.

Was this opportunity different than what was proposed in your NOI? Yes  No

Describe any other public involvement or participation opportunities conducted **during this reporting period:**

### MCM3: Illicit Discharge Detection and Elimination (IDDE)

#### Sanitary Sewer Overflows (SSOs)

*Check off the box below if the statement is true.*

This SSO section is NOT applicable because we DO NOT have sanitary sewer

*Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period.***

Number of SSOs identified:

Number of SSOs removed:

#### MS4 System Mapping

*Optional:* Provide additional status information regarding your map:

#### Screening of Outfalls/Interconnections

*If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.*

- No outfalls were inspected
- The outfall screening data is attached to the email submission
- The outfall screening data can be found at the following website:

Below, report on the number of outfalls/interconnections screened **during this reporting period**.

Number of outfalls screened:

Below, report on the percent of outfalls/interconnections screened **to date**.

Percent of outfalls screened:

*Optional:* Provide additional information regarding your outfall/interconnection screening:

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permittees. No screenings or catchment investigations have been conducted yet. Dry weather screening and sampling will be conducted by 30 June 2024. Catchment investigations on high and low priority outfalls will be completed by 30 June 2031. Currently, no outfalls are classified as problem outfalls. However, if future outfall ranking updates discover a problem outfall (possibly based on the results of dry weather screening), a catchment investigation on that outfall will begin earlier. See BMP 3b in the Westover ARB SWMP.

### **Catchment Investigations**

*If conducted, please submit all data collected during this reporting period as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.*

- No catchment investigations were conducted
- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following website:

Below, report on the number of catchment investigations completed **during this reporting period**.

Number of catchment investigations completed this reporting period:

Below, report on the percent of catchments investigated **to date**.

Percent of total catchments investigated:

*Optional:* Provide any additional information for clarity regarding the catchment investigations below:

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permittees. No screenings or catchment investigations have been conducted yet. Dry weather screening and sampling will be conducted by 30 June 2024. Catchment investigations on high and low priority outfalls will be completed by 30 June 2031. Currently, no outfalls are classified as problem outfalls. However, if future outfall ranking updates discover a problem outfall (possibly based on the results of dry weather screening), a catchment investigation on that outfall will begin earlier. See BMP 3b in the Westover ARB SWMP.

### **IDDE Progress**

*If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.*

- No illicit discharges were found

- The illicit discharge removal report is attached to the email submission
- The illicit discharge removal report can be found at the following website:

*Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period.***

Number of illicit discharges identified:

Number of illicit discharges removed:

Estimated volume of sewage removed:  gallons/day

*Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018).***

Total number of illicit discharges identified:

Total number of illicit discharges removed:

*Optional:* Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

No illicit discharges have been discovered. The deadline for IDDE written procedures for new non-traditional permittees is delayed until 30 June 2022. See BMP 3b in the Westover ARB SWMP.

**Employee Training**

Describe the frequency and type of employee training conducted **during this reporting period:**

No illicit discharge training has been conducted yet. EPA indicated to Westover that training is not required until completion of the IDDE Program written procedures which is due to be complete by 30 June 2022. See BMP 3b and 3e in the Westover ARB SWMP.

**MCM4: Construction Site Stormwater Runoff Control**

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period.***

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

*Optional:* Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Number of Site Plans: MSE Remove Tanks Project; DogPatch Construction; Shoppette Canopy Project;

**Repair Offloading Station****Number of Inspections:**

(20) Inspections at EOD Bunker Construction Site.

(2) Inspections at Runway 05/23 Repair

(2) Inspections at Indoor Small Arms Range Construction

**MCM5: Post-Construction Stormwater Management in New Development and Redevelopment****As-built Drawings***Below, report on the number of as-built drawings received during this reporting period.*Number of as-built drawings received: *Optional: Enter any additional information relevant to the submission of as-built drawings:*

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, including submission of as-built drawings and development of operation and maintenance procedures. Additionally ETL 14-1 includes additional operation and maintenance requirements for projects. Both of these documents are enforced at Westover ARB. See BMP 5c in the Westover SWMP.

**Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment due in year 4 of the permit term, including any planned or completed changes to local regulations and guidelines:

2020:

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. See BMP 5d in the Westover ARB SWMP.

Proposed 2021:

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. In addition to this requirement, Westover ARB has developed and adopted a written policy for construction storm water management that meets the requirements of the MS4 Permit by following storm water design guidelines described in the Massachusetts Stormwater Handbook. See BMP 5d in the Westover ARB SWMP.

**Green Infrastructure Report**

Describe the status of the green infrastructure report due in year 4 of the permit term, including the findings and progress towards making the practice allowable:

This report is not applicable to non-traditional permittees (2016 Final Permit Part 5.1.3).

**Retrofit Properties Inventory**

Describe the status of the inventory, due in year 4 of the permit term, of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

A list of retrofit opportunities will be developed by 30 June 2023. See BMP 5c in the Westover ARB SWMP.

**MCM6: Good Housekeeping**

**Catch Basin Cleaning**

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period.***

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

*Below, report on the total number of catch basins in the MS4 system.*

Total number of catch basins:

*If applicable:*

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

N/A

**Street Sweeping**

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

Number of miles cleaned:

Volume of material removed:  [Select Units]

Weight of material removed:  [Select Units]

**Stormwater Pollution Prevention Plan (SWPPP)**

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period.***

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

Westover is covered under the MSGP and its associated SWPPP, which is not reportable on this Annual Report Form.

**Additional Information**

**Monitoring or Study Results**

*Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.*

- Not applicable
- The results from additional reports or studies are attached to the email submission
- The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

**Additional Information**

*Optional:* Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

### **COVID-19 Impacts**

*Optional:* If any of the above year 3 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

### **Activities Planned for Next Reporting Period**

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 4 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

- Develop a report assessing current street design and parking lot guidelines and other local requirements within the municipality that affect the creation of impervious cover
- Develop a report assessing existing local regulations to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist
- Identify a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs to reduce impervious areas

### **Annual Requirements**

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Annual training to employees involved in IDDE program
- Update inventory of all known locations where SSOs have discharged to the MS4
- Continue public education and outreach program
- Update outfall and interconnection inventory and priority ranking and include data collected in connection with the dry weather screening and other relevant inspections conducted
- Implement IDDE program
- Review site plans of construction sites as part of the construction stormwater runoff control program
- Conduct site inspection of construction sites as necessary
- Inspect and maintain stormwater treatment structures
- Log catch basins cleaned or inspected
- Sweep all curbed streets at least annually
- Continue investigations of catchments associated with Problem Outfalls
- Implemented SWPPPs for all permittee owned or operated maintenance garages, public works yards, transfer stations, and other waste handling facilities

- Review inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment; update if necessary
- Review O&M programs for all permittee owned facilities; update if necessary
- Implement all maintenance procedures for permittee owned facilities in accordance with O&M programs
- Implement program for MS4 infrastructure maintenance to reduce the discharge of pollutants
- Enclose all road salt storage piles or facilities and implemented winter road maintenance procedures to minimize the use of road salt
- Review as-built drawings for new and redevelopment to ensure compliance with post construction bylaws, regulations, or regulatory mechanism consistent with permit requirements
- Inspect all permittee owned treatment structures (excluding catch basins)

Provide any additional details on activities planned for permit year 4 below:

In year 4, an IDDE written procedures plan will be developed, and the Nitrogen Source Identification Report will be completed. See SWMP Appendix D.

## Part V: Certification of Small MS4 Annual Report 2021

### 40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that 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.

Name:  Title:

Signature:  Date:

*[Signatory may be a duly authorized representative]*

**Year 4 Annual Report**  
**Massachusetts Small MS4 General Permit**  
**New Permittees**  
**Reporting Period: July 1, 2021-June 30, 2022**

*\*\*Please DO NOT attach any documents to this form. Instead, attach all requested documents to an email when submitting the form\*\**

*Unless otherwise noted, all fields are required to be filled out. If a field is left blank, it will be assumed the requirement or task has not been completed. Please ONLY report on activities between July 1, 2021 and June 30, 2022 unless otherwise requested.*

**Part I: Contact Information**

Name of Municipality or Organization:

EPA NPDES Permit Number:

**Primary MS4 Program Manager Contact Information**

Name:  Title:

Street Address Line 1:

Street Address Line 2:

City:  State:  Zip Code:

Email:  Phone Number:

**Stormwater Management Program (SWMP) Information**

SWMP Location (web address):

Date SWMP was Last Updated:

If the SWMP is not available on the web please provide the physical address:

## Part II: Self-Assessment

First, in the box below, select the impairment(s) and/or TMDL(s) that are applicable to your MS4.

<b>Impairment(s)</b>			
<input checked="" type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Chloride	<input checked="" type="checkbox"/> Nitrogen	<input type="checkbox"/> Phosphorus
<input checked="" type="checkbox"/> Solids/ Oil/ Grease (Hydrocarbons)/ Metals			
<b>TMDL(s)</b>			
<i>In State:</i>	<input type="checkbox"/> Assabet River Phosphorus	<input type="checkbox"/> Bacteria and Pathogen	<input type="checkbox"/> Cape Cod Nitrogen
	<input type="checkbox"/> Charles River Watershed Phosphorus	<input type="checkbox"/> Lake and Pond Phosphorus	
<i>Out of State:</i>	<input type="checkbox"/> Bacteria/Pathogens	<input type="checkbox"/> Metals	<input checked="" type="checkbox"/> Nitrogen
			<input type="checkbox"/> Phosphorus
			<input type="button" value="Clear Impairments and TMDLs"/>

Next, check off all requirements below that have been completed. **By checking each box you are certifying that you have completed that permit requirement fully.** If you have not completed a requirement leave the box unchecked. Additional information will be requested in later sections.

### Year 4 Requirements

- Identified and developed an inventory of all known locations where SSOs have discharged to the MS4 in the last 5 years
  - The SSO inventory is attached to the email submission
  - The SSO inventory can be found at the following website:
 

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>
- Identified each outfall and interconnection discharging from MS4, classified into the relevant category, and priority ranked each catchment for investigation
  - The priority ranking of outfalls/interconnections is attached to the email submission
  - The priority ranking of outfalls/interconnections can be found at the following website:
 

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>
- Developed written IDDE plan including a procedure for screening and sampling outfalls
- Developed written procedures to require the submission of as-built drawings and ensure the long term operation and maintenance of completed construction sites and added these procedures to the SWMP
- Developed written operations and maintenance procedures for parks and open space, buildings and facilities, and vehicles and equipment and added these procedures to the SWMP
- Developed an inventory of all permittee owned facilities in the categories of parks and open space, buildings and facilities, and vehicles and equipment and added this inventory to the SWMP
- Completed a written program for MS4 infrastructure maintenance to reduce the discharge of pollutants
  - Developed written SWPPPs, included in the SWMP, for all of the following permittee owned or operated facilities: maintenance garages, public works yards, transfer stations, and other waste handling facilities where pollutants are exposed to stormwater
- Enclosed or covered storage piles of salt or piles containing salt used for deicing or other purposes

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The Integrated Natural Resource Management Plan outlines many of the housekeeping requirements related to open spaces, and the BOS Contractor is the single workforce performing maintenance and upkeep of these areas.

#### Annual Requirements

- Provided an opportunity for public participation in review and implementation of SWMP and complied with State Public Notice Requirements
- Kept records relating to the permit available for 5 years and made available to the public
- Provided training to employees involved in IDDE program within the reporting period
- Properly stored and disposed of catch basin cleanings and street sweepings so they did not discharge to receiving waters
- All curbed roadways were swept at least once within the reporting period

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

The IDDE program was developed during this reporting period as required by MS4 timeline; annual employee training on the IDDE will begin during the upcoming reporting period.

#### **Bacteria/ Pathogens** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

##### Annual Requirements

###### *Public Education and Outreach\**

- Annual message was distributed encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Permittee or its agents disseminated educational material to dog owners at the time of issuance or renewal of dog license, or other appropriate time
- Provided information to owners of septic systems about proper maintenance in any catchment that discharges to a water body impaired for bacteria

*\* Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Unlike a traditional MS4, Westover does not have residences and does not have Military Family Housing, thus there are no pets or pet owners that live on-Base and thus there is no residential lawn maintenance. Traditional Permit holders need to send out educational messages multiple times per year, however at Westover, Federal contractors handle grass clippings, leaf litter. At Westover, Federal Government is the sole owner of a known quantity of septic systems, and septic systems are operated under strict Base Operating Service (BOS) contract terms. See Westover SWMP Section 4.1.2.

#### **Nitrogen** (Combination of Impaired Waters Requirements and TMDL Requirements as Applicable)

Annual Requirements*Public Education and Outreach\**

- Distributed an annual message in the spring (April/May) that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers
- Distributed an annual message in the summer (June/July) encouraging the proper management of pet waste, including noting any existing ordinances where appropriate
- Distributed an annual message in the fall (August/September/October) encouraging the proper disposal of leaf litter

\* *Public education messages can be combined with other public education requirements as applicable (see Appendix H and F for more information)*

*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots subject to Permit part 2.3.7.a.iii.(c) to a minimum of two times per year (spring and fall)

*Potential structural BMPs*

Any structural BMPs listed in Table 3 of Attachment 1 to Appendix H already existing or installed in the regulated area by the permittee or its agents was tracked and the nitrogen removal by the BMP was

- estimated consistent with Attachment 1 to Appendix H. The BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated nitrogen removed in mass per year by the BMP were documented.

- The BMP information is attached to the email submission
- The BMP information can be found at the following website:

<https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

Permit Appendix H is addressed in Section 3 of the Westover ARB SWMP.

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. Summary: Additional education regarding leaf litter is not needed. (See Westover SWMP Section 4.1.2)

**Solids, Oil and Grease (Hydrocarbons), or Metals**Annual Requirements*Good Housekeeping and Pollution Prevention for Permittee Owned Operations*

- Increased street sweeping frequency of all municipal owned streets and parking lots to a schedule to target areas with potential for high pollutant loads
- Prioritized inspection and maintenance for catch basins to ensure that no sump shall be more than 50 percent full; Cleaned catch basins more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings

*Optional:* If you would like to describe progress made on any incomplete requirements listed above or provide any additional details, please use the box below:

*Optional:* Use the box below to provide any additional information you would like to share as part of your self-assessment:

Westover attempts to sweep the runway/airfield everyday and the streets/parking lots once per month.

### Part III: Receiving Waters/Impaired Waters/TMDL

Have you made any changes to your lists of receiving waters, outfalls, or impairments since the NOI was submitted? Make sure you are referring to the most recent EPA approved Section 303(d) Impaired Waters List which can be found here: <https://www.epa.gov/tmdl/region-1-impaired-waters-and-303d-lists-state>

- Yes  
 No

If yes, describe below, including any relevant impairments or TMDLs:

## Part IV: Minimum Control Measures

Part IV includes some of the metrics that will be required in upcoming annual reports. For this annual report, please report on MCM1 and MCM2 and any other metrics below that have an asterisk (\*), along with any other metrics that you have started within this reporting period. Other than the metrics with an asterisk, the rest of the metrics are optional for new permittees. Then, proceed to Part V.

### \*MCM1: Public Education

Number of educational messages completed during this reporting period:

Below, report on the educational messages completed during this reporting period. For the measurable goal(s) please describe the method/measures used to assess the overall effectiveness of the educational program.

#### **BMP: 1a - Industrial Users (including employees, tenants, and contractors)**

Message Description and Distribution Method:

- Face-to-face training of Marine Vehicle Repair Shop in October and November of 2019 on Spill Prevention and Response;
- Stormwater training for Aircraft Maintenance Group on 6 and 9 February 2020 (see slideshow in Appendix F of the SWMP); and
- Posted Environmental Management System Posters throughout base on stormwater and pollution prevention topics (see example poster in Appendix F of the SWMP).

Targeted Audience:

Responsible Department/Parties:

Measurable Goal(s):

Message Date(s):

Message Completed for: Appendix F Requirements  Appendix H Requirements

Was this message different than what was proposed in your NOI? Yes  No

If yes, describe why the change was made:

### \*MCM2: Public Participation

Describe the opportunity provided for public involvement in the development of the Stormwater Management Program (SWMP) **during this reporting period:**

The SWMP and Annual Report were posted online for public feedback. See BMP 2a and 2b in the Westover ARB SWMP.

Was this opportunity different than what was proposed in your NOI? Yes  No

Describe any other public involvement or participation opportunities conducted **during this reporting period:**

### MCM3: Illicit Discharge Detection and Elimination (IDDE)

#### \*Sanitary Sewer Overflows (SSOs)

Check off the box below if the statement is true.

This SSO section is NOT applicable because we DO NOT have sanitary sewer

Below, report on the number of SSOs identified in the MS4 system and removed **during this reporting period.**

Number of SSOs identified:

Number of SSOs removed:

Below, report on the total number of SSOs identified in the MS4 system and removed to date. At a minimum, report SSOs identified **since the effective date of the permit (July 1, 2018).**

Total number of SSOs identified:

Total number of SSOs removed:

#### MS4 System Mapping

Below, check all that apply.

The following elements of the Phase I map have been completed:

- Outfalls and receiving waters
- Open channel conveyances

- Interconnections
- Municipally-owned stormwater treatment structures
- Waterbodies identified by name and indication of all use impairments
- Initial catchment delineations

Describe any additional progress you made on your map during this reporting period or provide additional status information regarding your map:

**Screening of Outfalls/Interconnections**

*If conducted, please submit any outfall monitoring results from this reporting period. Outfall monitoring results should include the date, outfall/interconnection identifier, location, weather conditions at time of sampling, precipitation in previous 48 hours, field screening parameter results, and results from all analyses. Please also include the updated inventory and ranking of outfalls/interconnections based on monitoring results.*

- No outfalls were inspected
- The outfall screening data is attached to the email submission
- The outfall screening data can be found at the following website:

*Below, report on the number of outfalls/interconnections screened **during this reporting period.***

Number of outfalls screened:

*Below, report on the percent of outfalls/interconnections screened **to date.***

Percent of outfalls screened:

*Optional: Provide additional information regarding your outfall/interconnection screening:*

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permittees. No screenings or catchment investigations have been conducted yet. Dry weather screening and sampling will be conducted by 30 June 2024. Catchment investigations on high and low priority outfalls will be completed by 30 June 2031. Currently, no outfalls are classified as problem outfalls. However, if future outfall ranking updates discover a problem outfall (possibly based on the results of dry weather screening), a catchment investigation on that outfall will begin earlier. See BMP 3b in the Westover ARB SWMP.

**Catchment Investigations**

*If conducted, please submit all data collected **during this reporting period** as part of the dry and wet weather investigations. Also include the presence or absence of System Vulnerability Factors for each catchment.*

- No catchment investigations were conducted
- The catchment investigation data is attached to the email submission
- The catchment investigation data can be found at the following website:

*Below, report on the number of catchment investigations completed **during this reporting period.***

Number of catchment investigations completed this reporting period: 0

Below, report on the percent of catchments investigated **to date**.

Percent of total catchments investigated: 0

Optional: Provide any additional information for clarity regarding the catchment investigations below:

Deadlines for dry weather screening and catchment investigations are delayed for new non-traditional permittees. No screenings or catchment investigations have been conducted yet. Dry weather screening and sampling will be conducted by 30 June 2024. Catchment investigations on high and low priority outfalls will be completed by 30 June 2031. Currently, no outfalls are classified as problem outfalls. However, if future outfall ranking updates discover a problem outfall (possibly based on the results of dry weather screening), a catchment investigation on that outfall will begin earlier. See BMP 3b in the Westover ARB SWMP.

**IDDE Progress**

If illicit discharges were found, please submit a document describing work conducted over this reporting period, and cumulative to date, including location source; description of the discharge; method of discovery; date of discovery; and date of elimination, mitigation, or enforcement OR planned corrective measures and schedule of removal.

- No illicit discharges were found
- The illicit discharge removal report is attached to the email submission
- The illicit discharge removal report can be found at the following website:

Empty text box for website information.

Below, report on the number of illicit discharges identified and removed, along with the volume of sewage removed **during this reporting period**.

Number of illicit discharges identified: 0

Number of illicit discharges removed: 0

Estimated volume of sewage removed: 0 gallons/day

Below, report on the total number of illicit discharges identified and removed to date. At a minimum, report on the number of illicit discharges identified and removed **since the effective date of the permit (July 1, 2018)**.

Total number of illicit discharges identified: 0

Total number of illicit discharges removed: 0

Optional: Provide any additional information for clarity regarding illicit discharges identified, removed, or planned to be removed below:

The IDDE plan was written during this reporting period. Catchment investigations of problem outfalls will begin during the year 5 reporting period, and IDDE employee training will be completed during the year 5 reporting period, by June 2023.

**Employee Training**

Describe the frequency and type of employee training if conducted **during this reporting period**:

### **MCM4: Construction Site Stormwater Runoff Control**

*Below, report on the construction site plan reviews, inspections, and enforcement actions completed **during this reporting period**.*

Number of site plan reviews completed:

Number of inspections completed:

Number of enforcement actions taken:

*Optional:* Enter any additional information relevant to construction site plan reviews, inspections, and enforcement actions:

Iso Hangar, Corps of Engineers (ACOE), 16 inspections. East Ramp, Westover Construction Inspectors, 14 inspections. Runway 0523, ACOE, 48 inspections and CEV 20 inspections. Site Plan Reviews: Taxiway G, Redhorse Dogpatch, ISO Hangar, Known Distance Range.

### **MCM5: Post-Construction Stormwater Management in New Development and Redevelopment**

#### **\*As-built Drawings**

Describe the status of the measures the MS4 has utilized to require the submission of as-built drawings and ensure long term operation and maintenance of completed construction sites:

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, including submission of as-built drawings and development of operation and maintenance procedures. Additionally ETL 14-1 includes additional operation and maintenance requirements for projects. Both of these documents are enforced at Westover ARB. See BMP 5c in the Westover SWMP.

#### **Street Design and Parking Lots Report**

Describe the status of the street design and parking lots assessment including any planned or completed changes to local regulations and guidelines:

2020:

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. See BMP 5d in the Westover ARB SWMP.

Proposed 2021:

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. In addition to this requirement, Westover ARB has developed and adopted a written policy for construction storm water management that meets the requirements of the MS4 Permit by following storm water design guidelines described in the Massachusetts Stormwater Handbook. See BMP 5d in the Westover ARB SWMP.

### **Green Infrastructure Report**

Describe the status of the green infrastructure report including the findings and progress towards making the practice allowable:

This report is not applicable to non-traditional permittees (2016 Final Permit Part 5.1.3).

### **Retrofit Properties Inventory**

Describe the status of the inventory of permittee-owned properties that could be modified or retrofitted with BMPs to mitigate impervious areas and report on any properties that have been modified or retrofitted:

A list of retrofit opportunities will be developed by 30 June 2023. See BMP 5c in the Westover ARB SWMP.

## **MCM6: Good Housekeeping**

### **\*Catch Basin Cleaning**

- The catch basin cleaning optimization plan or schedule is not complete
- The catch basin cleaning optimization plan or schedule is attached to the email submission
- The catch basin cleaning optimization plan or schedule can be found at the following website:

*Below, report on the number of catch basins inspected and cleaned, along with the total volume of material removed from the catch basins **during this reporting period.***

Number of catch basins inspected:

Number of catch basins cleaned:

Total volume or mass of material removed from all catch basins:

*Below, report on the total number of catch basins in the MS4 system, if known.*

Total number of catch basins:

*If applicable:*

Report on the actions taken if a catch basin sump is more than 50% full during two consecutive routine inspections/cleaning events:

**\*Street Sweeping**

- The written procedures for sweeping streets and municipal-owned lots is not complete
- The written procedures for sweeping streets and municipal-owned lots is attached to the email submission
- The written procedures for sweeping streets and municipal-owned lots can be found at the following website:

*Report on street sweeping completed **during this reporting period** using one of the three metrics below.*

Number of miles cleaned:

Volume of material removed:  [Select Units]

Weight of material removed:  [Select Units]

*If applicable:*

For rural uncurbed roadways with no catch basins, describe the progress of the inspection, documentation, and targeted sweeping plan:

**\*O&M Procedures and Inventory of Permittee-Owned Properties**

*Below, check all that apply.*

The following permittee-owned properties have been inventoried:

- Parks and open spaces
- Buildings and facilities
- Vehicles and equipment

The following O&M procedures for permittee-owned properties have been completed:

- Parks and open spaces
- Buildings and facilities
- Vehicles and equipment

**\*Winter Road Maintenance**

- The written procedures for winter road maintenance including the storage of salt and sand is not complete
- The written procedures for winter road maintenance including the storage of salt and sand is attached to the email submission
- The written procedures for winter road maintenance including storage of salt and sand can be found at the following website:

**\*Stormwater Pollution Prevention Plan (SWPPP)**

*Below, report on the number of site inspections for facilities that require a SWPPP completed **during this reporting period.***

Number of site inspections completed:

Describe any corrective actions taken at a facility with a SWPPP:

Westover is covered under the MSGP and its associated SWPPP, which is not reportable on this Annual Report Form, thus the number of inspections is zero.

## Part V: Additional Information

### **\*Monitoring or Study Results**

*Results from any other stormwater or receiving water quality monitoring or studies conducted during the reporting period not otherwise mentioned above, where the data is being used to inform permit compliance or permit effectiveness must be attached.*

- Not applicable
- The results from additional reports or studies are attached to the email submission
- The results from additional reports or studies can be found at the following website(s):

If such monitoring or studies were conducted on your behalf or if monitoring or studies conducted by other entities were reported to you, a brief description of the type of information gathered or received shall be described below:

### **Additional Information**

*Optional:* Enter any additional information relevant to your stormwater management program implementation during the reporting period. Include any BMP modifications made by the MS4 if not already discussed above:

### **COVID-19 Impacts**

*Optional:* If any of the above year 4 requirements could not be completed due to the impacts of COVID-19, please identify the requirement that could not be completed, any actions taken to attempt to complete the requirement, and reason the requirement could not be completed below:

### **\*Activities Planned for Next Reporting Period**

Please confirm that your SWMP has been, or will be, updated to comply with all applicable permit requirements including but not limited to the year 4 requirements summarized below. (Note: impaired waters and TMDL requirements are not listed below)

Yes, I agree

- Complete IDDE ordinance
- Complete Construction/ Erosion and Sediment Control (ESC) ordinance
- Develop written IDDE plan including a procedure for screening and sampling outfalls
- Develop a written catchment investigation procedure and added the procedure to the SWMP

#### Annual Requirements

- Annual report submitted and available to the public
- Annual opportunity for public participation in review and implementation of SWMP
- Keep records relating to the permit available for 5 years and make available to the public
- Properly store and dispose of catch basin cleanings and street sweepings so they do not discharge to receiving waters
- Continue public education and outreach program
- Sweep all curbed roadways at least once within the reporting period
- Provide training within the reporting period to employees involved in IDDE program
- Clean catch basins in accordance with catch basin cleaning procedures to ensure that no catch basin is greater than 50% full

Provide any additional details on activities planned for permit year 5 below:

The year 5 plan for Westover Air Reserve Base includes the following objectives:

- Begin catchment investigation on problem outfalls (BMP 3b; SWMP Section 4.3)
- Complete IDDE training to responsible employees (BMP 3e; SWMP Section 4.3)
- Compile list of five retrofit opportunities (BMP 5e; SWMP Section 4.5)
- Complete structural BMP evaluation of Retrofit opportunities (BMP 7b; SWMP Section 5.1)

## \*Part VI: Certification of Small MS4 Annual Report 2021

### 40 CFR 144.32(d) Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that 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.

Name:

Title:

Signature:

Date:

Digitally signed by  
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Date: 2022.09.08 13:26:21 -04'00'

*[Signatory may be a duly authorized representative]*

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## **Appendix Q**

### **Stormwater Design Policy**

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DEPARTMENT OF THE AIR FORCE  
AIR FORCE RESERVE COMMAND

10 September 2021

MEMORANDUM FOR DISTRIBUTION

FROM: 439 CE/BCE

SUBJECT: Westover Policy for the Design of Stormwater Management Systems

1. **REGULATION.** In accordance with Sections 2.3.6.a.ii and 5.1.2 of Westover's National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts, a written policy must be created to ensure compliance with the Permit's construction design requirements. The objective is to reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites.
2. **APPLICABILITY:** This policy is applicable to the design of new development and redevelopment sites that disturb ONE or more acres.
3. **REQUIREMENT:** The following five items must be met for new developments and redevelopments.
  - a. Low Impact Development site planning and design strategies must be implemented unless infeasible;
  - b. Stormwater management system design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook;
  - c. Stormwater management systems on **NEW** development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area of the site;
  - d. Stormwater management systems on **RE**-development sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of TSS AND 50% of the average annual load of TP related to the total post-construction impervious surface area on the site;
  - e. Finally, because all of the receiving waters are within the watershed of the Long Island Sound, which is impaired for Nitrogen, stormwater management best management practices (BMPs) must be optimized for nitrogen removal.

4. This policy is effective immediately. References and more details about the requirement set forth in this policy can be found in Attachment 1. Compliance matters and any questions about Westover's Stormwater Program can be directed to Champanine Saviengvong, Environmental Engineer, at 413-557-3951.

5. Per MS4 Permit Appendix B, Part B.11.D, documents generated under the terms of this permit must include the following 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."

MORIN.DAVID.BEN Digitally signed by  
JAMIN.1112840237 MORIN.DAVID.BENJ  
AMIN.1112840237

David B. Morin, PE  
Base Civil Engineer

**ATTACHMENT:**

1. Additional Information on the Policy for Stormwater Management System Design

**DISTRIBUTION:**

439 Mission Support Group  
439 Civil Engineering  
439 Civil Engineering Squadron  
439 AW/IGX, Wings Plan & Exercises  
Phoenix Management at Westover ARB  
U.S. Army Corps of Engineers, Westover Field Office

# ATTACHMENT 1: ADDITIONAL INFORMATION ON THE POLICY FOR STORMWATER MANAGEMENT SYSTEMS DESIGN

## INTRODUCTION AND BACKGROUND

This policy is intended to ensure compliance with the United States Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) in Massachusetts.

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. 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.

Section 2.3.6 of the 2016 Final Permit (as updated on 6 January 2021) is titled Stormwater management in New Development and Redevelopment (Post Construction Stormwater Management). The objective of these requirements is to reduce the discharge of pollutants found in stormwater through the retention or treatment of stormwater after construction on new or redeveloped sites.

## DEFINITIONS

**Site** – defined as the area of extent of construction activities, including but not limited to the creation of new impervious cover and improvement of existing impervious cover.

**New Development** – Defined as any construction activities or land alteration resulting in total earth disturbance equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover.

**Redevelopment** – Defined as any construction, land alteration, or improvement of impervious surface resulting in total earth disturbances equal or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development.

## **APPLICABILITY**

Per the 2016 Final Permit, this policy is applicable to runoff from new development and redevelopment sites that disturb one or more acres and discharge into the permittees MS4. This includes sites that are less than one acre if part of a larger common plan of development or redevelopment which disturbs greater than one acre.

Certain redevelopment projects related to road improvement are exempt from some of these requirements. These exemptions are described below for compliance with Requirement 4.

## **REQUIREMENTS**

The following five items must be met for new developments and redevelopments.

1. Low Impact Development (LID) site planning and design strategies must be implemented unless infeasible in order to reduce the discharge of stormwater from developed sites.
2. Stormwater management system design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook (MSH).
3. Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90% of the average annual load of Total Suspended Solids (TSS) related to the post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) related to the total post-construction impervious surface area of the site.
4. Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant removal equivalent to 80% of the average annual post-construction load of TSS AND 50% of the average annual load of TP related to the total post-construction impervious surface area on the site.
5. Finally, because all of the receiving waters are within the watershed of the Long Island Sound, which is impaired for Nitrogen, stormwater management best management practices (BMPs) must be optimized for nitrogen removal.

### ***Requirement 1 – Low Impact Development***

To meet Requirement 1, all new developments and redevelopments must consider taking advantage of the Low Impact Development Site Design Credits outlined in the Chapter 1 Volume 3 of the MSH. These design credits may allow for the elimination of certain structural BMPs. Additionally, site designs must also consider use of the LID technologies listed in Section 3-3 of Unified Facilities Criteria (UFC) 3-210-10 Low Impact Development. Consideration of these techniques must be documented and discussed in the design report.

### ***Requirement 2 – Massachusetts Stormwater Handbook***

All projects for which this policy is applicable to shall design in accordance with the 2008 Massachusetts Stormwater Handbook (MSH). In short, the MSH requires compliance with a set of Stormwater Management Standards, outlined below:

**Standard 1** – No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

**Standard 2** – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

**Standard 3** – Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. 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.

**Standard 4** – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). *Note that this standard is superseded by Requirement 3 and 4 from the 2016 Final Permit. However, the MSH design process and BMPs can demonstrate compliance with the TSS removal percentages from the 2016 Final Permit.*

**Standard 5** – For land uses with higher potential pollutant loads (LUHPPLs), source control and pollution prevention shall be implemented in accordance with the MSH to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If 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 MSH. 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.

**Standard 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 BMPs determined by

the Department to be suitable for managing discharges to such areas, as provided in the MSH. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. 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.

**Standard 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.

**Standard 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.

**Standard 9** – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

**Standard 10** – All illicit discharges to the stormwater management system are prohibited.

The MSH provides detailed procedures for BMP selection and a detailed design methodology for stormwater management systems. Compliance with the MSH and the Stormwater Management Standards shall be demonstrated in a detailed design report.

### ***Requirement 3 – New Development TSS and TP Removal Requirements***

Stormwater management systems on new developments shall be designed to meet an average annual pollutant load removal equivalent of 90% of the average annual load of TSS related to the total post-construction impervious area on the site AND 60% of the average annual load of TP related to the post-construction impervious area on the site. Pollutant removal must be calculated based on average annual loading and not the basis of any individual storm event. These requirements can be achieved through any of the following methods:

**Method 1** – Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1’s BMP Accounting and

Tracking Tool (2016) or other BMP performance evaluation tools provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or state-approved BMP design guidance or performance standard (such as the MSH) can be used to calculate BMP performance.

**Method 2** – Retaining the volume of runoff equivalent to, or greater than, 1 inch multiplied by the total post-construction impervious surface area on the site.

**Method 3** – Meeting a combination of retention and treatment that achieves the above standards.

**Method 4** – Utilized offsite mitigation that meets the above standards within the same USGS HUC12 watershed area.

Compliance with this requirement and the backup calculations must be documented in the design report.

#### ***Requirement 4 – Redevelopment TSS and TP Removal Requirements***

Stormwater management systems on redevelopment sites shall be designed to meet an average annual pollutant load removal equivalent of 80% of the average annual load of TSS related to the total post-construction impervious area on the site AND 50% of the average annual load of TP related to the post-construction impervious area on the site. Pollutant removal must be calculated based on average annual loading and not the basis of any individual storm event. These requirements can be achieved through any of the following methods:

**Method 1** – Installing BMPs that meet the pollutant removal percentages based on calculations developed consistent with EPA Region 1’s BMP Accounting and Tracking Tool (2016) or other BMP performance evaluation tools provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance, then any federally or state-approved BMP design guidance or performance standard (such as the MSH) can be used to calculate BMP performance.

**Method 2** – Retaining the volume of runoff equivalent to, or greater than, 0.8 inches multiplied by the total post-construction impervious surface area on the site.

**Method 3** – Meeting a combination of retention and treatment that achieves the above standards.

**Method 4** – Utilized offsite mitigation that meets the above standards within the same USGS HUC12 watershed area.

Compliance with this requirement and the backup calculations must be documented in the design report.

*Special Exemption:* This requirement is not applicable to redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects). These projects shall improve existing conditions unless infeasible. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet this requirement.

#### **Requirement 5 – Stormwater Management Systems Optimized for Nitrogen Removal**

New development and redevelopment site stormwater management BMPs shall be optimized for nitrogen removal. This can be achieved by utilizing BMPs identified by the MSH as able to remove nitrogen. The design report shall include calculations for BMP nitrogen removal efficiencies.